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May I Calculate Your Taxes?

The Effect of Bookkeeping on Tax Compliance under a Simplified Regime

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Abstract: Many countries worldwide face significant misreporting in tax declarations. Misreporting leads to undesired low revenue and economic distortions. This paper discusses the extent to which the residual bookkeeping burden faced by small firms in simplified regimes influence tax declarations. A randomized control trial among 1,500 irregular firms in Piaui, Brazil showed that adding the tax amount due and records on transactions to a warning notification improved compliance from 0 to 21 percent and increased the reported revenue in 39 percent. Firms without an accountant were less likely to regularize their status without the added information. These findings suggest the use of third-party information to support voluntary compliance may present an opportunity for digital services to improve tax revenue services.

Keywords: Taxpayer support, tax compliance, accounting.

JEL Codes: H26, H30, H32, O38

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I. Introduction

A priority goal of modern tax administrations is to strengthen tax collection by promoting voluntary tax compliance. Strengthening tax collection is a key goal to many states as it enables the financing of public goods and services, caps distortions to the economy, and supports redistributive policies.[1] To achieve this goal, simplified tax regimes were introduced in the 1990's with the objective to promote firm formality and enhance tax compliance by reducing the burden associated with filing and paying taxes. Most countries in the world have a simplified regime in place targeting small and medium firms (OECD 2015).[2]

Despite its popularity, simplified tax regimes face a tradeoff between reducing compliance costs and introducing distortions to the economy. Simplified regimes ignore the fact firms vary in income and expenditure structure. These distortions are further exacerbated by firms which do not comply or misreport. A well-documented approach to address misreporting and noncompliance is to align firm incentives to truthful reporting through coercive measures. A less documented approach is to address limitations that small and medium firms face to document transactions and file.[3]

This study documents the impact of an initiative to provide firms with the interpretation of the tax code accompanied by records of transactions captured by the electronic billing system in the state of Piaui, Brazil. The state compared annual tax declarations to electronic bill records to check for compliance against a purchase-to-revenue limit established by law at a minimum of 80 percent. The state sent an electronic notification to irregular firms stating they had 50 days to review its file or request a case review. The notification included the amount of revenue to adjust to comply and a link. The link provided firms with access to the record of transactions recorded by the electronic billing system. Were the message ignored, firms would enter a process for exclusion for the simplified regime applicable for the next three years. The initiative aimed thus to provide firms with the necessary accounting information to address misreporting and improve compliance.

This study documents evidence on the effect of providing firms with the interpretation of the tax code accompanied by a record of transactions on compliance with the purchase-

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[1] Tax capacity is not only important for states to function, but also to promote economic growth (Besley and Persson, 2013). Evasion remains a challenge despite the importance of collecting taxes, especially in many developing countries. It is estimated tax evasion was 6.3 percent of GDP in Latin America and the Caribbean in 2017 (ECLAC, 2019).

[2] Simplified tax regimes allow small and medium firms to file taxes based on presumptive profit grounds. The main assumption to its effectiveness is a lower burden for both firms and the revenue administration will strengthen tax collection. Simplified regimes are prevalent not only across countries but also within. For example, a survey by the Worlds Bank on Albania, Burundi, Nepal, South Africa, Ukraine and the Republic of Yemen found at least a third and up to 90 percent of firms qualified for the local simplified regime within countries (Coolidge and Yilmaz, 2016). The simplification of tax regimes is a relevant evolving policy. For example, India is launching a reform to reduce the filing burden to taxpayers and boost transparency. Link. In the United States, some cities in Colorado are implementing single filing portals Link. Moreover, multilateral organizations such as the World Bank advocate for the use of technology to reduce administrative burdens Link.

[3] There is a broad literature which discusses determinants of non-compliance and misreporting. For excellent reviews please see Slemrod (2019) and Pomeranz and Belda (2019).

to-revenue limit over the effect of a warning notification. Identification of effects rely on an experiment with two treatment arms implemented among 1,500 irregular firms. One group of firms received a notification with a link to the interpretation of the tax code and records if transactions. A second group of firms received the notification but did not get the link. Both responses are assessed against those of a third group of firms which did not receive any notification.

This paper documents three sets of findings. First, the link helped firms comply with the purchase-to-revenue limit. Compliance improved from 0 to 22 percent among firms that received a notification with a link, but only from 0 to 11 percent among those firms that did not receive a link. The notification without a link led firms to increase reported revenue in 46 percent (from about US$35 thousand to US$52 thousand). Adding the link to the notification further led to an adjustment of 6 percent increase (from about US$52 to US$54). However, the impact of the link is not statistically significant.

Second, the link discouraged firms to implement creative accounting practices. Firms could comply with the purchase-to-revenue limit without paying more taxes by increasing reported purchases and leaving revenue fixed. However, firms did not adjust purchases regardless of whether they received the link or not. The requirement of providing electronic bill records possibly prevented firms to adjust. In contrast, firms who received the link adjusted the share of revenue subject to tax withholding by increasing it in 3 percent (from 35 to 38 percent), but firms which did not get the link decreased it by 10 percentage points (from 35 to 25 percent). The link did not affect discrepancies between firm revenue reports and credit cards or federal tax records. Notifications without a link decreased the share discrepancies with credit card records (from 29 to 21 percent).

The link was especially useful to promote compliance among firms without accounting assistance. The notification without a link increased the share of compliant firms from 0 to 13 percent among those with assistance, but only from 0 to 7 percent among those with no assistance. The link increased these shares from 13 to 24 percent and from 7 to 20 percent respectively, thus reducing the gap.

Third, weak communication limited the impact of both the notification and the link. Only 47 percent of firms read the notification. A focus on firms that read the notification shows it led firms to adjust revenue in about US$32. The link prompted firms to further adjust revenue to an additional US$14 thousand). Firms which were provided with a link adjusted revenue to increase compliance with the purchases-to-revenue limit in 21 percentage points on top of the 30 percent increase caused by the notification without the link. These results are significantly larger than those observed on the full sample.

These findings make two contributions to our understanding of revenue services and taxation. First, it shows the digital collection of transactions and interpretation of the tax code can contribute to ameliorate socially inefficient behaviors introduced by simplified regimes. It highlights accounting is complementary to effective taxation. Firms have been found to remain small, underreport, or alter their structure to remain eligible as observed in Armenia, Japan, and Pakistan (Onji, 2009, Best et al., 2015, Asatryan and Peichl, 2017). This study contributes with evidence from Brazil which shows the interpretation of the tax code and accounting information on transactions may offset misreporting in simplified regimes.[4] Brazil is a case of interest as it is a country with one of the most decentralized and diverse tax systems in the world.[5]

A second contribution of this study is it shows interpreting the tax code and providing records on transactions to firms can make notifications more effective. This finding is related to two strands of the literature. First, it contributes to the literature on the use of third-party information to promote compliance. There is evidence revenue offices can use third party information to increase the credibility of threats and deter firms from misreporting (Bergolo et al., 2020, Brockmeyer et al., 2019, Slemrod et al. 2017, Pomeranz, 2015, Kleven et al., 2011, Carrillo, Pomeranz, and Singhal, 2017, Mittal and Mahajan, 2017).[6] However, evidence also shows firms may exploit information gaps to couple profits with deductions and thus, may avoid paying taxes (Carrillo, Pomeranz and Singhal, 2017, Slemrod et al. 2017). The consensus in the literature is that third party information is effective to enhance tax compliance on the margins where it reveals information but may lead to evasion on other margins (Pomeranz and Belda, 2019; Slemrod, 2019). A simplified regime limits such margins. Thus, this study documents a case in which conditions allow for third-party information to be sufficient to improve compliance. This study makes a novel approach relative to this literature because information is not primarily used as a coercive tool, but as a tool to overcome potential firm limitations to properly calculate taxes and record transactions.

Second, this study is also related to the literature on the role of a firms accounting burden on compliance. Recent studies argue limited taxpayer attention to interpret tax codes and record transactions play an important role in taxation (Gabaix, 2019, Fahri, 2020, Taubisk and Rees-Jones, 2018). Consistent with the idea tax complexity limits taxpayer ability to comply, evidence shows messages which decrease computational costs, tax withholding, and electronic tax collection has led to improved compliance in Argentina, Costa Rica and the United States (Lopez-Luzuriaga and Scartascini, 2019, Brockmeyer and Hernandez, 2018, Filkenstein, 2009). Zwick (2019) shows corporate tax complexity limits carryback refund take-up in the USA.[7] However, more evidence is necessary to better understand how the administrative burden associated with understanding, filing, and paying taxes impacts taxation as highlighted by Gabaix (2019), Slemrod (2019), and Engelschalk and Loeprick (2015). This study adds to this literature by documenting how the interpretation of the tax code and provision of the transaction records impact tax declarations among medium and small firms. It shows facilitating tax code interpretation and recording transactions for firms may present an opportunity to

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[4] Simplified regimes are a second-best solution to optimal taxation. For discussions on this topic, please see Kanbur and Keen (2014), Bigio and Zilberman (2011), and Dharmapala, Slemrod, and Wilson (2011). Simplified regimes have improved compliance in Armenia, Brazil, and Pakistan and favored firm survival in Brazil (Asatryan and Peichl, 2017, Monteiro and Assunção, 2012, Best et al., 2015, Conceição et al., 2018).
[5] Piaui is a relatively small State in Brazil with one of the lowest Gross Domestic Product (GDP) per capita. In 2017, Piauí represented only 0.69% of the Brazilian GDP and 4.79% of the GDP of the Northeast, which is the poorest and underdeveloped region in Brazil (Soares et al., 2016, CEPRO, 2019).
[6] Bergolo et al., (2020) labeled the fear that messages about audits generate as the “scarecrow” effect.
[7] Ulph (2015) discusses the concept of tax complexity and how to measure it. More generally, there is evidence consumers are more responsive to taxes when these are more salient (Chetty, Looney, and Kroft, 2009, Goldin and Homonoff, 2013).

use digital services to improve tax revenue services.[8] A key distributive aspect to explore is the administrative tax burden may disproportionally affect small firms, especially in regions with high illiteracy levels or limited access to information and communication technologies (Engelschalk, 2015, Coolidge and Faith, 2016, Aguhion et al., 2018). This study provides evidence small and medium firms without accounting services are more responsive to notifications when provided with accounting information.

This paper is organized as follows. Section II describes the *Simples Nacional* regime. Section III describes the data, and section IV describes the identification strategy. Section V presents the empirical results. Section VI concludes.

II. The *Simples Nacional* Tax Regime

The simplified tax regime SIMPLES Nacional (*Sistema Integrado de Pagamento de Impostos e Contribuções das Microempresas e Empresas de Pequeno Porte)* was implemented on June 30th of 2007 under Complementary Law 123/06 with the objective of centralizing federal tax revenue among subnational entities.[9] The regime unifies the tax base and collection of eight different federal, state, and municipal taxes and social contributions.[10] Such unification allows firms to use a single simplified tax form (*Documento de Arrecadação do Simples*, *DAS*) to estimate the amount due and pay taxes making one bank deposit on the 20th of the month following that in which gross revenues are earned. The simplified regime also facilitate accounting by allowing firms to estimate taxes based on income and not invoices issued.

Eligible firms must have a maximum gross revenue of R$4.8 million per calendar year, and the ratio of revenue to purchases for commercialization or industrialization must be more than or equal to 125 percent.[11] Firms which fail to meet eligibility rules enter a

[8] This study contributes more broadly to the literature on how to strengthen state capacity in developing countries through the digitalization of public services (Muralidharan et al., 2016, Bossuroy, Callen et al., 2020, Muralidharan, et al., 2020). This is a policy relevant area to explore as governments are increasingly digitalizing processes to reduce the cost of storage, computation, and transmission of data (Goldfarb and Tucker, 2019).

[9] On average filing demanded firms in Brazil a total of 1,501 hours in 2018 while the world average is 234 hours (PWC and World Bank, 2020, World Bank, 2020).

[10] The federal revenue office collects taxes and then distributes it among states and municipalities. The simplified regime covers: (i) The state value added tax to interstate or intermunicipal trade (*Imposto sobre Operações relativas à Circulação de Mercadorias e Prestação de Serviços de Transporte Interestadual e Intermunicipal e de Comunicação, ICMS*), (ii) the federal corporate income tax (*Imposto sobre a renda das pessoas jurídicas, IRPJ*), (iii) the federal tax on net profit (*Contribuição Social sobre o Lucro Líquido, CSLL*), (iv) federal contributions to social security (*Contribuição para Financiamento da Seguridade Social, COFINS*), (v) federal contributions to employees' savings (*Programa de Integração Social, PIS, and Programa de Formação do Patrimônio do Servidor Público, PASEP*), (vi) federal tax on industrialized products (*Imposto sobre Produtos Industrializados, IPI*), (vii) federal contributions to employer's social security (*Contribuição Patronal Previdenciária, CPP*), and (viii) the municipal tax on services (*Imposto sobre Serviços, ISS*). All taxes are collected with a universal taxpayer identifier (*Cadastro Nacional da Pessoa Jurídica, CNPJ*).

[11] The threshold is R$9.6 million for exporting firms. Firms with revenue over R$ 3.6 million must pay VAT liabilities directly to the state of Piauí through the SIAT portal and are obliged to pay the remaining taxes outside the *Simplified Regime*. There are 3 firms which report revenue over this threshold in our sample.

three-year pause denominated *exclusão de ofício*. In 2019, a total of 30,129 firms out of 48,000 of the firms subject to VAT filed under the simplified tax regime in Piaui (64 percent).

Tax rates under the simplified regime vary according to six annual gross revenue brackets which vary across economic sectors. The nominal tax rates increase with revenue and vary from 4 percent to 30 percent. There is a deductible for each bracket which vary from R$0 to R$720,000. Revenue derived from items subject to tax withholding must be excluded. Withholdings are associated to revenue generated by beverages, cigarettes, dairy products, medicines, among other products with production concentrated in a few firms. The tax rates and deductibles are publicized as annexes to the law. **Appendix A** summarizes law contents related to the exclusion of some sectors (such as financial services or firearm trade) and lists the tax table for firms in commerce for illustration purposes.

Firms under the simplified tax regime may face a lower tax burden and face lower administrative costs. Monteiro (2004) estimates firms face an average reduction of 8 percentage points on the effective tax rate. Paes and Almeida (2009) estimate a tax burden between 17 and 20 percent of revenues among firms in the simplified regime, while firms not in the simplified face rates between 23 and 40 percent. In addition, firms perceive a significant increase in administrative costs associated to other tax regimes. A survey in 2015 to manufacturing entrepreneurs in Brasil found 70 percent of firms qualified the tax system as problematic due its complexity (CNI, 2015). Indeed, the Brazilian federal structure grants states and municipalities autonomy to reform, administer, and enforce its fiscal rules and processes, resulting in taxpayers facing multiple tax rules.

Before 2020 the State had limited information and capacity to verify and enforce compliance of the purchase-to-revenue eligibility limit among firms filing under the simplified regime. Piaui had about 100,000 taxpayers but only 163 auditors. Out of these 163, only 56 were responsible for auditing tax files. The available information systems and software allowed auditors to inspect around 1,785 firms per month. Most of the information available to auditors were electronic records of transactions as captured by the electronic invoice system (*Notas Fiscais de Consumidor Eletrônica, NFC-e and Notas Fiscais Eletrônicas, NF-e*) and electronic filing records submitted by firms. Auditors had no access to software to automatically reconcile these two data sources or check for compliance of rules. In addition, none of the auditors was exclusively assigned to check for compliance with simplified regime eligibility.

To address these limitations, the state acquired new analytical tools and trained auditors to allow for a massive systematic analysis of eligibility compliance. The new system allowed auditors to target their work on cases highlighted by mechanical detection. The improved systems estimated gaps in revenue reports and found mechanical irregularities in 64 percent of the 30,129 firms filing under the simplified regime in January of 2020. These improvements were part of the country wide initiative *Programa de Modernização da Gestão Fiscal no Brasil* (PROFISCO). PROFISCO was launched in 2008 with the goal to promote fiscal sustainability through the modernization of fiscal management, the promotion of improvements in tax administration, and the promotion of improvements in the administration of public expenditure.

The State piloted the effects of notifications on irregularities through the firm's electronic address (*Domicilio Tributário Eletrônico, DT-e*)8F. Both State and firms must communicate through the DT-e as per Article 16, § 1º-A of complementary law 123/2006.[12]A subset of 1,000 firms received a notification in the DT-e inbox on February 10th, 2020. The notification stated the firm was found not to comply with the purchase-to-revenue eligibility limit. Half of these firms received a notification with an additional electronic link. The link led firms to a self-service module with a calculation of the revenue gap to comply with the purchase-to-revenue limit and a full record of transactions (*Agencia Virtual de Atendimento*, e-AGEAT). These records included a list of detected transactions not recorded in the declaration, any outstanding fines, and detected non-eligible purchases. The messages stated no action taken by March 31st, 2020 would trigger the process for exclusion from the simplified regime. The message likely carried some credibility because 4,192 firms were excluded from the simplified regime in the capital of the State Teresina in 2019 for unpaid balances (SEFAZ, 2020). **Appendix B** shows the full messages sent to the firms and screen shots of the system.

III. Data Sources

The data used in this study come from the Secretariat of Finance of the State of Piauí (*Secretaria da Fazenda do Estado do Piaui, SEFAZ*) monthly digital bookkeeping records (*Sistema Público de Escrituração Digital, SPED*) records from January of 2019 to May of 2020. [13] The data includes information on VAT liability as estimated by the country-wide electronic invoice record system NFC-e (business-to-consumer) and NF-e (business-to-business). The data also includes information on taxable and non-taxable revenue, eligible and non-eligible purchases, the firm's age in years, whether the firm is in the retail sector or not, whether the firm is located in the capital of the State or not, and whether the firm reported to have the assistance of a professional registered accountant.[14] We set to missing atypical values of revenue and purchases and set to missing the top 5 percent values. **Appendix C** summarizes the information available, details the definition of each variable, and a timeline for the evaluation.

The sample of firms in this study is composed of 1,498 firms which were classified as eligible for the simplified regime between January and April of 2020. The State prioritized firms with a clear record on its legal statue (*natureza jurídica*), had an established electronic communication with the fiscal electronic address (DT-e), had turnover of more

[12] Access is available to firms through the State portal (*Sistema Integrado de Administração Tributária, SIAT*).
[13] Our data focuses on the period before the May 21st, 2020 partial lockdown due the COVID-19 pandemic.
[14] Non-taxable revenues refer to revenues taxed under the VAT withholding regime (ICMS-ST). Under this regime, the tax collected at an early stage of the value-added chain includes the estimated tax due on the value added in subsequent stages of the chain based on the stipulation of an arbitrary markup percentage for product sales. Eligible purchases are those destined for trading or industrialization.

than R$250,000, and had a revenue-to-purchases ratio lower than 50 percent.[15] These 1,500 firms represent 8 percent of the 19,153 firms in the state which were found not to comply with at least one eligibility criteria. These 19,153 firms represent 64 percent of the 30,129 firms in the state that file under the simplified regime. Firms in the simplified regime represent 62 percent of the about 48 thousand firms in the state that are subject to VAT taxation.10F13F[16]

IV. Identification Strategy

This study relies on a stratified experimental design with two treatment arms. Out of the 1,500 firms in the sample, four strata were created according to revenue reported in 2019 to improve precision of estimates (Athey and Imbens, 2017).[17] Within each strata, treatment was assigned with equal probability. Firms in one of the three groups received notifications. Firms on a second group received the same notification except it included a link to records of transactions. Firms on the third group were not contacted to serve as a control group.

The experiment allows to compare the response of the notification on the group of firms which received the link to the response of the group of firms that did not in the same time period. Specifically, impacts are estimated by the following empirical model:

$$y_{is} = \eta_s + \beta TN_{is} + \gamma TN_{is}TI_{is} + \varepsilon_{is} \quad (1)$$

where y_{is} is the outcome of interest for firm *i* in strata *s*. Outcomes include compliance with the purchase-to-revenue limit, revenue, purchases, withholdings, and discrepancies with credit card and federal tax records. The variable *TN* is a dummy with value 1 if the firm received the notification and 0 otherwise. The variable *TI* is a dummy variable with value 1 if the firm received the link with information with the calculation of the amount to pay and records on transactions, and 0 otherwise.[18] The term ε_{is} denotes error. The term η_s denotes a strata fixed effect. Estimation of average effects is accompanied by robust standard errors.

V. Descriptive Statistics and Baseline Balance

This section provides descriptive statistics of the study sample and investigate baseline balance in the context of the estimation strategy. Table 1 reports the baseline means of firm characteristics for the control group and differences in the baseline means of the two treatment arms. Table 1 column (1) reports the baseline means for the control group. It shows the average firm in the sample is 11 years old, had revenues of US$ 29,990, input purchases of US$ 114,553, and filed US$297 in VAT in 2019. A share of 19 percent of firms are geographically located in Teresina, the capital of the State, 81 percent work in retail, and 77 percent filed with assistance of a professional accountant.

[15] A total of 77 firms were randomly excluded to round the sample from 1,577 to 1,500 firms. Two firms had errors in revenue reports and were excluded, resulting in a sample of 1,498 firms.
[16] The state has over 100,000 taxpayers in total.
[17] Such design is useful in the extent reported revenue is correlated to misreporting. There is evidence of such correlation in Chile and the USA (Pomeranz, 2015; Bachas, Fattal Jaef, and Jensen, 2019).
[18] In total, the TN dummy equals 1 for 1,000 firms and 0 for 500 firms. The TI dummy equals 1 for 500 firms and 0 for 1,000 firms.

In contrast, the average firm in the State reported revenues of US$41,240, purchases of US$29,206, and a VAT of US$597 in 2019. A total of 33 percent of firms were geographically located in Teresina, and 74 filed with assistance of a professional accountant. These amounts are statistically different from those corresponding to the study sample (p=0.026 for revenue, p=0.000 for purchases, p=0.000 for VAT, p=0.000 for geographic location, and p=0.0.007 for accounting assistance).

A key assumption to identify treatment effects is randomization created groups that are not different on average. This assumption is supported by the fact there are no statistically significant differences on the observed firm characteristics between the treatment and control groups, or between the two treatment groups. Table 1 column (2) reports the baseline means for the group which will later receive the notification without detailed information; and column (3) reports baseline means for the group which will receive the notification with the link to records of transactions. Columns (4) and (5) and (6) show p-values for tests of the null hypothesis of equal means between each treatment arm and the control group. Column (6) shows the p-value for the test of the null hypothesis of equal means between the two treatment groups. All p-values do not allow to reject equality of means at the 15 percent confidence level.

A common threat to the experimental designs is attrition. However, attrition in the evaluation sample was low at 6 percent and not related to treatment. Out of the 1,500 firms, only two could not be observed two months later and 87 firms (5.8 percent) received notifications from municipal or federal authorities to be excluded from the simplified regime. These communications are not systematically related to either treatment (p=0.232). We conclude neither attrition nor communications by fiscal authorities at other levels of government are likely to bias impact estimates.

[Insert Table 1 Here]

A second threat to the experiment design is contamination. If firms in any of the treatment arms conveyed information to the other treatment arm, or the control group; then impact estimates would be biased. The links included firm-specific information. Thus, spillovers via accounting were unlikely, but communication among firms changing their perceptions remain a threat. There is no data to confirm if such spillovers took place. However, firms in the control group and firms in the notification-without-information group would improve compliance upon an increased perceived threat of penalties. In such scenario, our estimates would present a lower bound estimate to treatment effects.[19]

VI. Empirical Results

This section presents estimates of the impact of providing a firm with a link with the amount due and records of transactions on firm responses to comply with the purchase-to-revenue eligibility limit. The first subsection discusses impacts on revenue and compliance with the limit. The second subsection discusses adjustment on purchases, revenue subject to withholding, and irregularities as per credit card or federal tax

[19] General equilibrium effects are unlikely given the sample represents 5 percent of firms that filed under the simplified regime in the state and the experiment spans three months.

records. The third subsection discusses heterogeneity of impacts. The last subsection discusses how results vary under alternative specifications.

a. Compliance with the purchase-to-revenue eligibility limit

Table 2 column (1) shows notifications increased compliance from 0 to 11 percent. Providing a link further increased compliance from 11 to 22 percent. Column (2) shows notifications led firms to adjust revenue in 46 percent (from about US$ 35 to US$ 52 thousand). Firms with a link reported revenues on an additional 6 percent (from about US$ 52 thousand to US$ 54 thousand), but this difference is not statistically significant.

The adjustments on revenue are large relative to impacts found in other contexts. For example, Carrillo, Pomeranz, and Singhal (2017) found a notification with information prompted an increase in reported revenue among firms in Ecuador of 9 percent (from US$ 973 to US$ 1,059 thousand dollars). The comparison is not straightforward because firms in Ecuador were larger and filed under the more complex corporate income tax regime. [20]

Figure 1 shows the shift on the ratio of revenues over purchases. It shows firms which did not receive a link were more likely to report under the threshold (shown as the revenue-to-purchase limit of 1.25, which is the inverse of the purchase-to-revenue limit of 0.80). Firms adjusted revenue upwards but did not fully account for the full gap to eligibility. Firms either with or without a link bunched around the eligibility threshold showing compliance on salient rules. This behavior is consistent that documented by Best et al. (2015) for Pakistan, and Asatryan and Paichl (2017) for Armenia.

[Insert Table 2 here]

[Insert Figure 1 here]

b. Amendements to purchases, withholdings and consistency with third-party records

Firms did not adjust purchases or withholding reports to avoid taxes. Table 2 column (3) shows firms did not adjust reports on eligible purchases. Therefore, notifications had a positive impact on tax liability, and the link with information had no additional effect. The absence of effects may likely be explained by the fact that adjusting purchases required receipts and Brazil had recently implemented an electronic transaction trail. Column (4) shows firms reduced the share of purchases subject to tax withholding in 10 percentage points (from 35 to 25 percent). Firms may have focused on adjustments to comply with the threshold by reporting revenue which did not require detailed accounting records. However, the link provided firms with information which a largely offset this effect by causing an increase of 13 percentage points (from 25 to 38 percent). These findings contrast with findings of Carrillo, Pomeranz and Singhal (2017) in Ecuador and Slemrod

[20] A second example is that of Pomeranz (2015). The author found a notification warning of a future audit caused no changes in mean declared VAT in Chile (declared VAT averaged US$ 538). The author argues the notification had little effect given transactions among firms left a paper trail. Slemrod et al. (2017) estimates credit-card information led to an increase in reported receipts by up to 24 percent among those filing returns in the USA.

et al. (2017) in the United States who find firms may adjust reporting to reduce taxable revenue.

Column (5) shows the notification caused the share of firms which were found irregular according to credit card records to decrease from 29 to 21 percent. The link did not have any additional impact. Column (6) shows no impact on inconsistencies with federal tax records. Neither credit card records nor federal tax records were mentioned either in the notification or the link. Therefore, the lack of impact on consistency with these records is consistent with the idea firms likely have limited attention and focus on salient accounting lines.

c. The Role of Firm Characteristics

A major caveat of this study is the sample is restricted to firms filing under a simplified regime and with large deviations to meet the purchase-to-revenue rule. As a result, it is not possible to empirically assess treatment effects on the average firm in the State. However, an analysis of heterogeneity of impacts may provide insights into how sensitive impacts are to firm characteristics.

Table 3 reports impact variation across baseline firm characteristics. The columns headers display the specific firm characteristic to analyze. Each column shows estimates of impacts for one regression. All regressions follow our main specification but add interaction terms and controls for the firm characteristic. Column (1) shows tests for differences on impacts among firms in the first quartile of declared revenue in 2019. Column (2) shows the notification led to an increase in compliance from 0 to 13 percent among firms which filed with assistance of an accountant, but only from 0 to 7 percent among firms which filed with no assistance. The link to records boosted the effect of the notification in 6 percentage points. This effect did not vary with accountant assistance. Column (3) shows the impact of notifications with or without a link did not vary across firms in or out of the retail sector. This result is different from studies that have found stronger responses among firms with paper trail such as those of Pomeranz (2015) in Chile and Mittal and Mahajan (2017) in India. Columns (4) and (5) show there was no heterogeneity of impacts across firms' age or geographic location.

[Insert Table 3 Here]

Next, the analysis focuses on the 47 percent of firms that read the message. An instrumental variable approach allows to estimate the local average treatment effect. The treatment allocation dummies are used as instruments for both reading the notification and reading the notification with a link. Table 4 shows local average treatment effects resulting from this analysis. Panel A column (1) shows effects on compliance were larger in magnitude among firms which read the message when compared to the full sample. Information cause firms to increase revenue reported. Information boosted compliance on 30 percentage points on top of the 21 percentage points increase caused by the notification (from 21 to 51 percent). Column (2) shows notifications caused revenue to increase in US$32,108. The link with additional information caused firms to further increase revenue reports in an additional US$13,951.

Therefore, the link boosted the effect of the notification in 43 percent (US$13,951/US$32,108). Column (3) shows there were no effects on eligible purchases. Column (4) shows the link to records not only offset the dip caused by notifications on the share of revenue subject to tax withholding (dip of 19 percentage points). It rather increases it in around 8 percentage points. Firms that received the notification without the link may have decreased the share of revenue subject to tax withholding to

Column (5) shows the share of irregularities with bank records decreased 15 percentage points. The link to records does not impact the size of this effect. Column (6) shows no impacts on irregularities as per federal tax records. Panel B shows first stage estimates. Column (1) shows 53 percent of firms which were sent a notification read it, but only 43 percent of firms which received a notification with a link did. Column (2) shows 43 percent of firms that were sent a notification with a link read it.[21]

[Insert Table 4 Here]

d. Robustness Tests

This section discusses the sensitivity of results to alternative specifications. First, the inclusion of a set of observable control variables do not change results. Firm controls include size, whether the firm filed with assistance of a certified accountant at baseline, whether the firm works in retail, age, and geographic location. We find that, for all variables, the coefficients are not statistically different to those presented. This evidence is consistent with the assumption that the experiment successfully provided local exogenous variation in treatment assignment.

Second, the inclusion of the top 5 percent of observations increases the magnitude of impacts of the link on total revenue. Including all values result in a statistically significant impact of US$ 13,003. This effect is statistically different from the US$ 2,266 estimate shown in table 1 (p=0.082). The impact of the notification is also larger at US$ 23,606 when compared to the US$ 16,191 estimate shown in table 1 (p=0.070). These increases imply impacts on revenue of 58 percent and 32 percent by the notification and the link, respectively. Local average treatment effects on the 47 percent of firms which read the message are also larger. The impact of the link is US$ 40,405 which is statistically larger than the US$ 13,951 estimated when we exclude the top 5 percent values (p=0.036). The impact of notifications increases from US$ 32,108 to US$ 44,964, but the difference is not statistically different at 10 percent (p=0.106). Local effects including all values imply information increases revenue in 100 percent of a top of a 111 percent increase caused by notifications without information.

We conclude our estimates are robust to the inclusion of controls. Our preferred estimates may be conservative as information may have had a larger impact on

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[21] Two key assumptions for the validity of the instrumental variable approach are relevance and exogeneity. The effect of the notification on reading were simultaneously estimated for both treatment arms. The R-squared values (0.219 for firms that got the notification and 0.307 for those that got the link) show instruments explain a significant share of variation on which firms read the notifications. Therefore, the instruments are relevant. Finally, the random allocation of notifications and information to groups ensure the instruments are exogenous.

revenue. All data used for estimation is directly taken from official state records. **Appendix D** lists tables with estimates for the alternative specifications discussed in this section.

d. Cost-Effectiveness

The impact estimates on compliance allow to estimate the cost-effectiveness of the intervention. Administrative data allows to estimate incremental costs of treatment of about US$ 28 per firm. Most of this cost was explained by the time of auditors spent managing emails, analyzing databases, updating records, and detonating the exclusion process when applicable. This marginal variable cost is estimated at US$ 24 dollars per firm. The estimated impacts of adding the links with information imply an added marginal revenue per firm of US$ 16,191. Thus, the cost to the state to add one dollar of revenue is less than a cent (US$ 0.002 = US$ 28/US$ 16,191). The intervention may allow to improve the efficiency of tax collection because the estimated cost to collect a dollar of revenue in the state is 7.0 cents (IDB, 2018).

Weak communication limits the efficiency of notifications. The effect of the link on revenue was not statistically significant overall but increased it in 39 percent among firms that read the notification. The marginal cost to provide taxpayers with access to information is close to null given the existing infrastructure. A focus on firms that read the message shows the cost to the state to add one dollar of revenue is half of that based on all firms (US$ 0.001 = US$ 28/US$ 46,059).

VII. Conclusions

This paper investigates the impact of providing small and medium firms with a link with an interpretation of the tax code and record on transactions on tax reporting and compliance. A randomized control trial among 1,500 firms in Piaui, Brazil shows the link allowed firms to comply with the simplified regime requirements. The link allowed an additional 11 percent of firms to comply with the purchase-to-revenue limit on top of the 11 percent effect caused by a notification without a link. The link did not cause a statistically significant impact on revenue overall. However, a focus on the 47 percent of firms that read the notification shows it boosted the impact of the notification in 43 percent. Overall, neither the notification nor the link had an impact on purchase reports. The link helped firms reduce payments of taxes already withheld but did not reduce discrepancies with credit card or federal tax records. The effect of notifications with no link was weaker among firms with no accounting assistance.

The documented results have several implications. First, results show government accounting capacity is complementary to monitoring and enforcement. This study shows accounting may be important for small and medium firms. Firms without accounting assistance were more responsive notifications were accompanied by accounting records. Firms may have faced limited access to information and communication technologies or accounting services. Firms could also find accounting records to add credibility to the notifications. This study does not allow to tell the extent in which the accounting burden or credibility components of the link could affect firm compliance. However, this study shows digital records of transactions present tax administrations with an opportunity to strengthen filing assistance services.

Second, a simplified taxation scheme coupled with third-party information may work as a steppingstone towards a more efficient tax base. This study shows short term improvements to compliance are possible under a limited number of tax lines and when making irregularities salient. Such schemes may allow for tax administrations to target audits and limit the margins in which firms may evade.

Third, the study implies tax evasion of at least 46 percent among firms in the sample. A first order restriction to address evasion is weak communication. Only 47 percent of firms read the notification. Compliance with the purchase-to-revenue limit improved from 0 to 73 percent among those firms that read the notification. This effect was only 0 to 22 percent overall, showing weak communication severely limits the impact of tax revenue services. The adaptation of information and communication technologies to improve communication poses an area with potential to enhance compliance.

The findings in this study should be interpreted considering several caveats that point to directions for future research. First, this study is restricted to a sample of irregular firms which file under a simplified regime. Piaui is a relatively small State in Brazil with one of the lowest Gross Domestic Products. Brazil is one of the most decentralized tax systems in the world. Despite finding no variation of impacts among firm size, sector, or geographic location; variation in accounting assistance and communication suggest results will vary when treatment is analyzed on a more diverse sample. The impact of providing accounting information in other contexts and in the long run remains to be explored. Given the high replicability of our experiment such area of work may be promising. Second, policy design demands a better understanding of the interaction of communication, the administrative burden faced by firms, and incentives. It is especially relevant to identify the role of the administrative burden faced by firms in relatively more marginalized contexts as ignoring it may accentuate inequalities. The recent implementation of communications via cellular phone and the implementation of the virtual assistant *Teresa* in the state may present an opportunity to better understand such interactions. Further exploring these issues on a broader set of contexts and in the long run remain relevant as countries around the world continue to adopt and reform simplified tax regimes with the goal to address taxpayer’s needs, improve tax collection, and enhance transparency.

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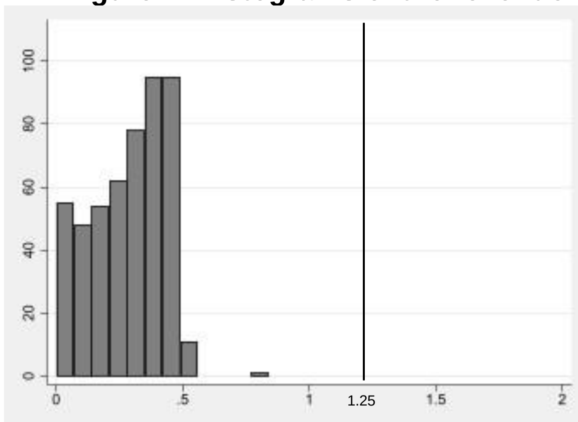
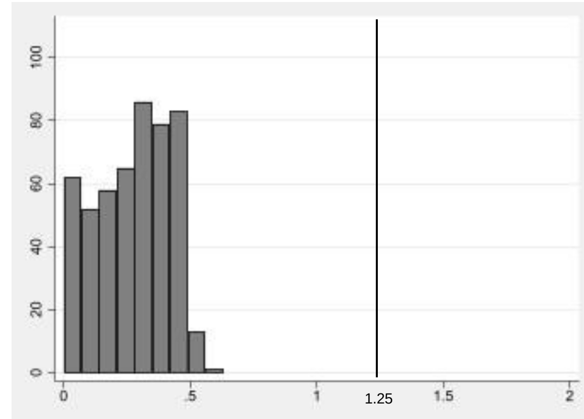
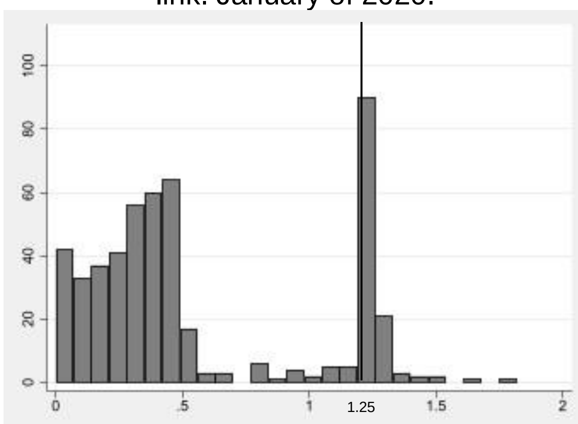
Figure 1. Histograms of the revenue-to-purchases ratio before and after notifications



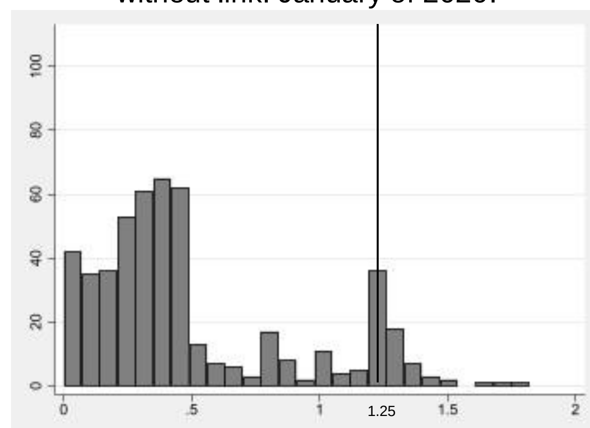
(a) Number of firms set to receive a notification with a link. January of 2020.



(b) Number of firms set to receive a notification without link. January of 2020.



(c) Number of firms set to receive a notification with a link. May of 2020



(d) Number of firms set to receive a notification without link. May of 2020

Source: Authors' calculations.
Note: The vertical line at 1.25 shows the minimum eligibility threshold for firms to file under the simplified regime.

Table 1. Baseline means and balance of firm characteristics.

				p-value for test of equality		
	Mean control group	Difference (Notification mean vs control mean)	Difference (Notification with information mean vs control mean)	Notification vs control (1)-(2)	Notification with information vs control (3)-(1)	Notification vs notification with information (3)-(2)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Firm Characteristics						
Firm age in years	10.77	-0.06	0.30	0.916	0.594	0.515
	(8.54)	[0.52]	[0.56]			
Retail	0.81	0.00	-0.00	0.948	0.924	0.872
	(0.39)	[0.02]	[0.02]			
Filed with accountant assistance	0.77	0.00	-0.00	0.895	0.927	0.823
	(0.42)	[0.03]	[0.03]			
Located in the capital of the state Teresina	0.19	0.01	0.01	0.624	0.624	1.000
	(0.40)	[0.03]	[0.03]			
Panel B. Compliance with simplified regime						
Revenue to purchases ratio	0.28	-0.01	0.01	0.517	0.467	0.168
	(0.15)	[0.01]	[0.01]			
Revenue (US$)	29,990	195	275	0.898	0.859	0.958
	(23,922)	[8,374]	[8,489]			
Purchases (US$)	114,553	1,528	-4,681	0.729	0.270	0.160
	(65,439)	[24,241]	[23,322]			

Continues…

Table 1. Baseline means and balance of firm characteristics (continued).

	Mean control group	Difference (Notification mean vs control mean)	Difference (Notification with information mean vs control mean)	p-value for test of equality		
				Notification vs control (1)-(2)	Notification with information vs control (3)-(1)	Notification vs notification with information (3)-(2)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel C. Tax filing status and payments						
Irregularity as per credit card records	0.40	-0.02	-0.00	0.533	0.969	0.559
	(0.49)	[0.03]	[0.03]			
Irregularity as per federal tax records	0.18	0.00	0.03	0.857	0.222	0.298
	(0.38)	[0.02]	[0.02]			
VAT collection 2019 (US$)	297	20	5	0.399	0.837	0.521
	(341)	[127]	[122]			
VAT collection 2018 (US$)	336	0	-11	0.997	0.693	0.686
	(462)	[163]	[160]			
VAT collection 2017 (US$)	240	-24	-6	0.298	0.798	0.429
	(376)	[128]	[132]			
Credit card transactions as share of revenue	0.36	-0.05	-0.03	0.091	0.297	0.503
	(0.50)	[0.03]	[0.03]			
Observations	500	499	499			

Source: Authors' calculations. Note: * Dummy variables with value 1 if yes and 0 if not. Based on 1,498 firms. Standard deviations in parenthesis and standard error of differences in brackets.

Table 2. **Impact of notifications on firm filing amendments and compliance with the simplified regime eligibility rule.**

	Complies with purchase-to-revenue limit (1 if yes, 0 if no)	Total revenue (UD$)	Eligible Purchases (US$)	Share of revenue subject to tax withholding	Irregularities as per credit card records (1 if yes, 0 if `	Irregularities as per federal tax records (1 if yes, 0 if `
	(1)	(2)	(3)	(4)	(5)	(6)
Notification	0.11***	16,191***	-977	-0.10***	-0.08***	-0.02
	[0.01]	[2,021]	[3,480]	[0.02]	[0.02]	[0.02]
Link	0.11***	2,266	-3,842	0.13***	0.02	0.02
	[0.023]	[2,627]	[3,239]	[0.02]	[0.02]	[0.02]
Control group	0.00	35,489	115,289	0.35	0.29	0.12
R-squared	0.185	0.699	0.850	0.455	0.250	0.118

Source: Authors' calculations. Notes: Estimations based on 1,498 firms. The purchase-to-revenue limit establishes the ratio must be at least 0.80 for a firm to file under the simplified regime. Eligible purchases refer to those of inputs for commercialization or industrialization. Each column reports estimates from a separate strata fixed effect model. Robust standard errors in brackets. All outcomes refer to records as of May 10, 2020, which is 3 months after the firms received the notification. The ratio eligibility rule to file under the simplified regime establishes a maximum purchase-to-revenue ratio of 0.80. *** p<0.01, ** p<0.05, * p<0.1

Table 3. Heterogeneity of the impacts of notifications on compliance by firm characteristic. Dependent variable: Compliance with simplified regime eligibility.

	First quartile of revenue 2019 (1 if yes, 0 if no)	Filed with assistance of an accountant (1 if yes, 0 if no)	Retail (1 if yes, 0 if no)	Age of firm below sample mean (1 if yes, 0 if no)	Located in capital of the State Teresina (1 if yes, 0 if no)
	(1)	(2)	(3)	(4)	(5)
Notification	0.10***	0.07***	0.07***	0.10***	0.12***
	[0.02]	[0.02]	[0.03]	[0.02]	[0.02]
Link	0.13***	0.13***	0.13***	0.13***	0.11***
	[0.03]	[0.04]	[0.05]	[0.03]	[0.03]
Notification * Firm characteristic	0.03	0.06**	0.05	0.02	-0.05
	[0.04]	[0.03]	[0.03]	[0.03]	[0.03]
Link * Firm characteristic	-0.07	-0.02	-0.03	-0.03	-0.01
	[0.05]	[0.05]	[0.06]	[0.05]	[0.05]
Mean in control group	0.00	0.00	0.00	0.00	0.00

Source: Authors' calculations. Notes: Estimations based on 1,498 firms. The purchase-to-revenue limit establishes the ratio must be at least 0.80 for a firm to file under the simplified regime. Eligible purchases refer to those of inputs for commercialization or industrialization. Each column reports coefficients from a separate strata fixed effect model. The dependent variable for models is a dummy for compliance with the ratio eligibility rule. Firm characteristics refer to those listed in the column headers. Robust standard errors in brackets. All outcomes refer to records as of May 10, 2020, which is 3 months after the firms received the notification. *** p<0.01, ** p<0.05, * p<0.001.

Table 4. **Local average treatment effects of the impact of notifications on firm filing amendments and compliance with the simplified regime eligibility rule.**

	Complies with purchase-to-revenue limit (1 if yes, 0 if no)	Total revenue (US$)	Eligible Purchases (US$)	Share of revenue subject to tax withholding	Irregularities as per credit card records (1 if yes, 0 if no)	Irregularities as per federal tax records (1 if yes, 0 if no)
	(1)	(2)	(3)	(4)	(5)	(6)
Notification	0.21***	32,108***	-1,885	-0.19***	-0.15***	-0.04
	[0.03]	[3,925]	[6,668]	[0.04]	[0.05]	[0.03]
Link	0.30***	13,951**	-9,688	0.27***	0.02	0.04
	[0.05]	[5,748]	[7,056]	[0.05]	[0.05]	[0.04]
R-squared	0.186	0.716	0.849	0.444	0.251	0.121
	Read message with notification	Read message with link				
Notification	0.53***	-0.00				
	[0.022]	[0.00]				
Link	-0.10***	0.43***				
	[0.03]	[0.02]				
R-squared	0.219	0.307				
Take up rate	0.53	0.43				

Source: Authors' calculations. Notes: Estimations based on 1,498 firms. The purchase-to-revenue limit establishes the ratio must be at least 0.80 for a firm to file under the simplified regime. Eligible purchases refer to those of inputs for commercialization or industrialization. Each column reports estimates from a separate strata fixed effect model. Robust standard errors in brackets. The dependent variable for column (1) is a dummy variable for eligibility for the simplified regime. Eligible firms must have a ratio of total eligible purchases to revenue under 0.8. The dependent variables for columns (2) and (3) are amounts expressed in US$. The dependent variables in columns (4) and (5) are ratios. All outcomes refer to records as of May 10, 2020, which is 3 months after the firms received the notification. *** p<0.01, ** p<0.05.

Online Appendices

Appendix A. The simplified regime eligibility and tax margins

The current simplified tax regime in Brazil, *Simples Nacional*, is a second generation of a system first created in 1996 by the federal government called *Simples Federal*. In 2007, the system was improved to incorporate state and municipal tax collection. The main feature of the new system was the direct tax collection. Taxpayers deposit in any bank the amount established in a simplified tax form (*Documento de Arrecadação do Simples*, *DAS*) provided by the federal tax authorities. The federation channels funds to local, state, or federal revenue accounts.7 Adherence to the regime was very low as states and municipalities had independently established simplified regimes targeting micro and small enterprises. In 2000, none of the Brazilian states and only 124 municipalities out of more than 5,000 municipalities had integrated local taxes to the federal tax regime (Viol and Rodrigues, 2000). In 2006, the Complementary Law 123/06 made the VAT and ISS a mandatory component of the simplified regime. Before 2007 the simplified regime as understood as any simplified filing system for medium and small firms. Thus, the federation and each state had a system denominated differently such as the *Simples Paulista*16F[22].

Firms filing under the *Simples Nacional* regime must (i) maintain electronic invoices of their sales and purchases and pay taxes monthly (The state form DIEF and the federal form DAS), (ii) keep a cash register and, (iii) file a federal annual simplified tax return (*Declaração de Informações Socioeconômicas e Fiscais, DEFIS*). Firms can apply for the *Simples Nacional* regime through an online platform (*Programa Gerador do Documento de Arrecadação do Simples Nacional, PGDAS-D*) maintained by the Secretariat for Federal Revenue (*Receita Federal do Brasil, RFB*).15F17F[23] Firms which provide financial services, trade cigarettes and firearms, allot or incorporate real state, import or manufacture automobiles and motorcycles, or import fuels or electric power are not eligible.

Tax obligations are estimated based on gross revenue.[24] Table A1 illustrates one of the five tables included in the law. The nominal rate and the deductibles vary with revenue brackets. The figure also shows how the tax collected is allocated across the different tax lines which comprise the simplified regime.

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[22] Simples Federal is the name of the first version of Simples Nacional.

[23] Access through http://www8.receita.fazenda.gov.br/SimplesNacional as retrieved July 30th, 2020.

[24] For example, a firm with a monthly gross revenue of US$40,000 a firm would pay US$40,000*0.73-[US$1,080*(US$40,000/US$480,000)]. Firms must file purchases every month to the State (*Declaração de Informações Econômico-Fiscais, DIEF*) and revenue every month (*Programa Gerador do Documento de Arrecadação do Simples Nacional, PGDAS-D*) to the Secretariat for Federal Revenue (*Receita Federal do Brasil, RFB*). Firms must also file an annual declaration (*Declaração de Informações Socioeconômicas e Fiscais, DEFIS*) to report administrative information to the Secretariat for Federal Revenue. This includes initial and final number of employees, number of business partners, balances in cash and bank accounts, remuneration of partners and general expenses. All information declared is relative to the previous year.

Table A1. Annex I of Complementary Law 123/06 – Commerce

Tax rates and share of each tax in the total collection under SIMPLES Nacional

Gross Revenue in the last twelve months (US$)		Nominal tax rate	Deductible (US$)
1st tax bracket	Up to US$ 32,728	4.0%	-
2nd tax bracket	Between US$ 32,728.01 and US$ 65,455	7.3%	US$ 1,080
3rd tax bracket	Between US$ 65,455.01 and US$ 130,910	9.5%	US$ 2,520
4th tax bracket	Between US$ 130,910.01 and US$ 327,273	10.7%	US$ 4,091
5th tax bracket	Between US$ 327,273.01 and US$ 654,546	14.3%	US$ 15,873
6th tax bracket	Between US$ 654,546.01 and US$ 872,728	19%	US$ 68,723

	Percentage of tax collection					
	IRPJ	CSLL	COFINS	PIS/PASEP	CPP	ICMS
1st tax bracket	5.5%	3.5%	12.74%	2.76%	41.5%	34%
2nd tax bracket	5.5%	3.5%	12.74%	2.76%	41.5%	34%
3rd tax bracket	5.5%	3.5%	12.74%	2.76%	42%	33.5%
4th tax bracket	5.5%	3.5%	12.74%	2.76%	42%	33.5%
5th tax bracket	5.5%	3.5%	12.74%	2.76%	42%	33.5%
6th tax bracket	13.5%	10%	28.27%	6.13%	42.1%	-

Notes: values in US$ were rounded. The exchange rate used is R$5.5 per US$ as of August of 2020 (BCB, 2020).

Appendix B. Notifications

Prezado Contribuinte,

Verificações eletrônicas realizadas no conjunto de informações apresentadas à Receita Federal do Brasil e à SEFAZ-PI, **detectaram que a Receita Bruta Anual declarada no ano 2019 em PGDAS-D é inferior ao mínimo previsto na LC 123/2006, art. 29, X**, de acordo com o valor das compras de mercadorias para comercialização/industrialização no mesmo período.

O Art. 29, X, da LC 123/2006, **dispõe que a exclusão de ofício das empresas optantes pelo Simples Nacional** dar-se-á quando for constatado **que durante o ano-calendário o valor das aquisições de mercadorias para comercialização ou industrialização**, ressalvadas hipóteses justificadas de aumento de estoque, **for superior a 80% dos ingressos de recursos no mesmo período**, excluído o ano de início de atividade.

Para ***consultar os valores identificados, acesse a Malha Fiscal Exclusão do Simples Nacional*** *– Compras Incompatíveis no SIATWEB*
(http://webas.sefaz.pi.gov.br/siatweb) em:

Autoatendimento > Malhas Fiscais > Consulta de Malhas

O contribuinte poderá efetuar a sua autorregularização, mediante a retificação dos valores declarados em PGDAS, ou comprovar outros ingressos de recursos mediante contestação **até o dia 31 de março de 2020, sob pena de exclusão de ofício do Simples Nacional.**

A contestação deverá ser enviada exclusivamente por meio do e-mail exclusaosn@sefaz.pi.gov.br, conforme explicação detalhada na Ficha da Malha, que pode ser consultada no seguinte endereço:

<https://drive.sefaz.pi.gov.br/index.php/s/htC8JOKaQk0OtjB>.

A autorregularização é uma oportunidade de corrigir eventuais erros em informações declaradas, antes de ser iniciado o procedimento fiscal. É importante ressaltar que esta Malha Fiscal não deixará o contribuinte em Situação Fiscal Irregular.

Em 11 de maio de 2020, será enviada uma nova notificação via DT-e com a situação atualizada do contribuinte em malha. Sendo assim, o contribuinte que efetuar a retificação ou contestação, não precisará entrar em contato com a SEFAZ-PI, bastando aguardar o envio dessa nova notificação via DT-e.

Fundamentação legal: art. 3º, §1º, art. 29, X e §1º e art. 34. da LC nº 123/06 e art. 85, §11 e 12 da Resolução CGSN nº 140/2018.

Atenciosamente,

SECRETARIA DA FAZENDA DO ESTADO DO PIAUÍ

Figure B1: Notification including link to record of transactions.

Prezado Contribuinte,

Verificações eletrônicas realizadas no conjunto de informações apresentadas à Receita Federal do Brasil e à SEFAZ-PI, **detectaram que a Receita Bruta Anual declarada no ano 2019 em PGDAS-D é inferior ao mínimo previsto na LC 123/2006, art. 29, X**, de acordo com o valor das compras de mercadorias para comercialização/industrialização no mesmo período.

O Art. 29, X, da LC 123/2006, **dispõe que a exclusão de ofício das empresas optantes pelo Simples Nacional** dar-se-á quando for constatado **que durante o ano-calendário o valor das aquisições de mercadorias para comercialização ou industrialização**, ressalvadas hipóteses justificadas de aumento de estoque, **for superior a 80% dos ingressos de recursos no mesmo período**, excluído o ano de início de atividade.

O contribuinte poderá efetuar a sua autorregularização, mediante a retificação dos valores declarados em PGDAS, ou comprovar outros ingressos de recursos mediante contestação **até o dia 31 de março de 2020**, **sob pena de exclusão de ofício do Simples Nacional.**

A contestação deverá ser enviada exclusivamente por meio do e-mail exclusaosn@sefaz.pi.gov.br, conforme explicação detalhada na Ficha da Malha, que pode ser consultada no seguinte endereço:

<https://drive.sefaz.pi.gov.br/index.php/s/htC8JOKaQk0OtjB>.

A autorregularização é uma oportunidade de corrigir eventuais erros em informações declaradas, antes de ser iniciado o procedimento fiscal. É importante ressaltar que esta Malha Fiscal não deixará o contribuinte em Situação Fiscal Irregular.

Em 11 de maio de 2020, será enviada uma nova notificação via DT-e com a situação atualizada do contribuinte em malha. Sendo assim, o contribuinte que efetuar a retificação ou contestação, não precisará entrar em contato com a SEFAZ-PI, bastando aguardar o envio dessa nova notificação via DT-e.

Fundamentação legal: art. 3º, §1º, art. 29, X e §1º e art. 34. da LC nº 123/06 e art. 85, §11 e 12 da Resolução CGSN nº 140/2018.

Atenciosamente,

SECRETARIA DA FAZENDA DO ESTADO DO PIAUÍ.

Figure B2: Notification without link to record of transactions.

Consulta de Malhas

Inscrição Estadual:

Razão Social:

Consulta

OBS: Os períodos intimados pelo Sistema Eletrônico de Malhas via DT-e não estão disponíveis para consulta nesta página.
Para visualizá-los, acesse e-AGEAT - módulo Malhas Fiscais - Manifestação do Contribuinte.

DECLARAÇÃO DIEF/PGDAS				
Identificação da Malha	Qtd. Períodos	ICMS Devido/Destacado	Qtd. NFe	Opções
ENTRADAS NÃO REGISTRADAS	20	3.976,29	150	
MULTA ATRASO ENTREGA DIEF	2	70,60	0	
EXCLUSÃO DO SIMPLES NACIONAL – COMPRAS INCOMPATÍVEIS	1	0,00	1	

Total de Registros: 3

Exportar Excel

SIAT *web*

SEFAZ
Secretaria da Fazenda do Estado do Piauí

Autoatendimento

Usuário:

Pagina Inicial Sair

Desenquadramento do Simples Nacional

Inscrição Estadual:

Razão Social:

Exercicio: 2019

Consultar

Exercício	Entradas Totais	Entradas Líquidas *	Receita Bruta	Receita Bruta/Entradas **	Receita Bruta min esperada
2019	1.788.824,00	1.788.824,00	113.892,40	6%	2.236.030,00

Total de Registros: 1

Exportar Excel

Voltar

*** Considera-se como redução das entradas totais: entradas não destinadas à comercialização ou industrialização e devoluções.**

**** As entradas líquidas devem ser iguais ou inferiores a 80% dos ingressos de recursos no mesmo período, de acordo com o inciso X do artigo 29 da LC 123/2006, o que equivale ao percentual calculado da Receita Bruta em relação as Entradas líquidas de no mínimo 125%.**

Figure B3. Tax administration website with information available on transactions regarding the simplified regimes only to firms participating in the study (*Sistema Integrado de Administraçao Tributária*, SIAT).

Appendix C. Definition of variables used in the tables and timeline

Table C1. Definition of variables.

Variable	Description
Firm age in years	Firm's age in years. For the computation, we consider the difference between the day in which the firm was first registered and May 10, 2020.
Located in the capital of the state Teresina	Dummy variable with value 1 if the firm is located in the capital Teresina and 0 otherwise.
Retail	Dummy variable with value 1 if the firm's main activity is retail commerce according to the taxonomy of the National Classification of Economic Activities (*'Classificação Nacional de Atividades Econômicas', CNAE 2.0,* first two-digit code: 47) and 0 otherwise.
Filed with accountant assistance	Dummy variable with value 1 if the firm informed to have filed with assistance of a professional accountant, 0 otherwise.
Total Revenue (US$)	Total revenue declared in the monthly declarations to the federal tax authority (*Programa Gerador do Documento de Arrecadação do Simples Nacional, PGDAS*) in US dollars.[1] For the purposes of the law, revenue is defined as the proceeds from the sale of goods and services in firms' own account operations and the result in operations in a third party account. Gross revenues do not include canceled sales or unconditional discounts granted.
Eligible purchases (US$)	Net input purchases for commercialization or industrialization declared in the monthly declaration to the state tax authority (*Declaração de Informações Econômico-Fiscais, DIEF*) in US dollars.[1]
VAT collection (US$)	Payments to the State of Piaui in US$ to meet value added tax collection liabilities in US dollars (*Imposto sobre Operações relativas à Circulação de Mercadorias e Prestação de Serviços de Transporte Interestadual e Intermunicipal e de Comunicação,* ICMS). Information only available for 2017, 2018, and 2019.[1]
Irregularities as per credit card records	Dummy variable with value 1 if cross-checking informational systems of the state detected credit card sales as reported by third-party records to be incompatible with revenues declared in the monthly declarations to the federal tax authority (*Programa Gerador do Documento de Arrecadação do Simples Nacional, PGDAS*) and 0 otherwise
Irregularities as per federal tax records	Dummy variable with value 1 if cross-checking informational systems of the state detected differences between the revenue recorded in the monthly declarations to the federal tax authority (*Programa Gerador do Documento de Arrecadação do Simples Nacional, PGDAS*) and the records of the electronic invoice data (NFC-e and/or NF-e) and 0 otherwise.
Credit card transactions as share of revenue	Volume of 2019 credit card transactions as reported by third-party records and expressed as a share of total revenue.

Notification	Dummy variable with value 1 if the firm was sent a notification and 0 if not.
Link	Dummy variable with value 1 if the firm was sent a notification with a link to the amount due and additional information on transactions and 0 if not.
Complies with purchase-to-revenue limit	Dummy variable with value 1 if the ratio of revenues to purchases is less than 0.8, and 0 if not.
Share of revenue subject to tax withholding	Share of total revenue declared in the 2020 annual tax return subject to the tax withholding regime (ICMS-ST). Withholdings are associated to revenue generated by beverages, cigarettes, dairy products, medicines, among other products with production concentrated in a few firms.

[1] The exchange rate used is R$5.5 per US$ as of August of 2020 (BCB, 2020).

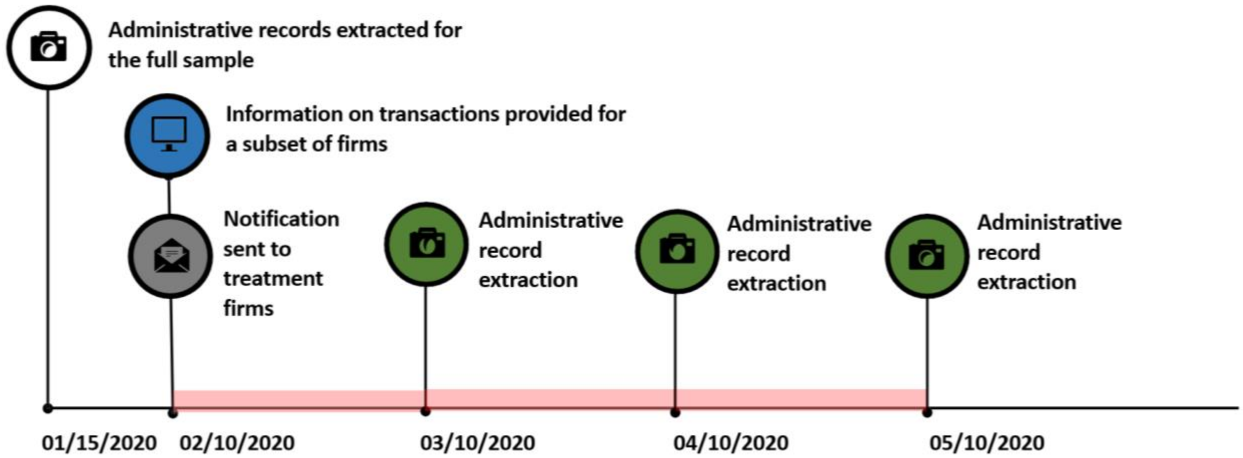

Figure C1. Evaluation timeline. Source: Secretaria da Fazenda do Estado do Piauí (SEFAZ, 2020)

Appendix D. Robustness checks

This appendix presents estimates for alternative specifications. Table D1 shows estimates including controls for size, whether the firm filed with assistance of a certified accountant at baseline, whether the firm works in retail, age, and geographic location. We find that, for all variables, the estimates are both similar in magnitude and statistical significance.

Table D1. Impact of notifications on firm filing amendments and compliance with the simplified regime eligibility rule

	Complies with purchase-to-revenue limit (1 if yes, 0 if no)	Total revenue (US$)	Eligible Purchases (US$)	Share of revenue subject to tax withholding	Credit card sales discrepancy (1 if yes, 0 if no)	Declared revenue discrepancy (1 if yes, 0 if no)
	(1)	(2)	(3)	(4)	(5)	(6)
Notification	0.11***	17,204***	-1,179	-0.10***	-0.08***	-0.03
	[0.01]	[1,974]	[3,411]	[0.02]	[0.03]	[0.02]
Link	0.11***	1,752	-5,361*	0.14***	0.02	0.02
	[0.02]	[2,642]	[3,148]	[0.02]	[0.03]	[0.02]
Control group	0.00	35,489	115,289	0.34	0.29	0.12
R-squared	0.189	0.681	0.848	0.490	0.269	0.120

Source: Authors' calculations. Notes: Estimations based on 1,498 firms. Each column reports estimates from a separate strata fixed effect model with controls. Controls include the firm's age in years, VAT collection in 2019, and dummies for the firm being in retail, filed with accountant assistance, or is in the capital of the state Teresina. Robust standard errors in brackets. All outcomes refer to May 10, 2020, which is 3 months after the firms received the notification. The ratio eligibility rule to file under the simplified regime establishes a maximum purchase-to-revenue ratio of 0.80. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table D2. Impact of notifications on firm filing amendments and compliance with the simplified regime eligibility rule

	Total revenue (US$)				Eligible purchases (US$)			
	Main specification	Controls	Add top 5% values	Add top 5%	Main specification	Controls	Add top 5% values	Add top 5% values
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Notification	16,191***	17,204***	23,606***	44,964***	-977	-1,179	-3,904	-7,435
	[2,021]	[1,974]	[3,757]	[6,922]	[3,480]	[3,411]	[11,563]	[21,981]
		(0.720)	(0.082)	(0.106)		(0.967)	(0.808)	(0.809)
Link	2,266	1,752	13,003**	40,405***	-3,842	-5,361*	1,940	2,855
	[2,627]	[2,642]	[5,323]	[11,227]	[3,239]	[3,148]	[9,347]	[20,301]
		(0.890)	(0.070)	(0.036)		(0.739)	(0.559)	(0.559)
Control group	35,489	35,489	40,590	40,590	115,289	115,289	143,645	143,645
Observations	1,423	1,423	1,498	1,498	1,423	1,423	1,498	1,498
R-squared	0.699	0.681	0.514		0.850	0.848	0.471	

Source: Authors' calculations. Notes: Each column shows estimates based on a different regression. Column (1) lists coefficients estimated by the preferred specification and as listed in table 1. Column (2) lists estimation of impacts including controls. Column (3) shows estimation including the top 5 percent values of the outcome variable. Column (4) shows estimates of the local average treatment effect when including the top 5 percent values of the outcome variable. Robust standard errors in brackets. P-values for the difference of the point estimate to that of the coefficient estimated by the preferred specification are listed in parenthesis. *** p<0.01, ** p<0.05, * p<0.1