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A Field Experiment During a Tax Amnesty
in Argentina

Edgar Castro
Carlos Scartascini

Department of Research and
Chief Economist

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Edgar Castro*

Carlos Scartascini**

* George Mason University

** Inter-American Development Bank

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Imperfect Attention in Public Policy: A Field Experiment During a Tax Amnesty in Argentina

Edgar Castro* Carlos Scartascini†

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Abstract

Limited attention affects our ability to make good choices, but governments can improve decision-making by providing simpler and more salient information. We evaluate the role of inattention in decision-making in the context of a field experiment implemented during a tax amnesty in the city of Santa Fe (Argentina). Tax amnesties are advertised to delinquent taxpayers through direct communication. In the intervention, we redesign the communication notices sent to the taxpayers to evaluate whether increasing salience and reducing cognitive costs increase the probability that taxpayers put attention to the message and understand better the benefits of tax amnesty. We randomize more than 54,000 taxpayers. A group of taxpayers receives the traditional messages. The treatment groups receive redesigned communications. Our results show that messages that reduce the cognitive costs increase the probability that taxpayers will enter the tax amnesty. The amount collected in the treatment groups is up to 8 percent higher than in the control group. We also exploit the exogenous variation in attention to evaluate the convenience of the tax amnesty program for the city given that some people may stop paying the regular bills (creates moral hazard). We find that while people are more willing to cancel their past debt, they are also more likely to reduce their compliance with the current tax bills. Moreover, there is a negative spillover effect in the compliant population (those who had no debts). When the tax amnesty becomes more noticeable, their incentive to comply falls substantially. Making public policy more salient, easier to understand, and less cognitive intensive facilitates decision-making. However, doing it during a tax amnesty may increase collection of past debt, but it could also generate negative incentives for tax compliance in the overall population.

Keywords: Inattention, Behavioral Biases, Tax Compliance, Tax Amnesty, Field Experiment, Public Policy.

JEL Codes: C93, H42, H23, D62

*ecastrom@masonlive.gmu.edu

†carlossc@iadb.org

1 Introduction

Limited attention affects our ability to make the best choices (Sims, 2010). For instance, consumers pay unnecessarily high prices at the supermarket because they ignore the sales tax when it is not included in the price tag (Chetty et al., 2009). Health services consumers miss the opportunity of choosing the insurance plan that provides the most benefits for them because they have a hard time choosing when they have too many options (Heiss et al., 2013). Taxpayers fail to respond to the decades-old tax incentive for labor supply -Earned Income Tax Credit (EITC)- when they do not live in areas where information is more widely dispersed (Chetty et al., 2013). Even when making important choices, such as buying a car, consumers tend to rely only on a few cues and avoid considering relevant aspects such as the future cost of gasoline (Allcott and Wozny, 2014). Not even the financial industry is foreign to these behaviors (Dellavigna and Pollet, 2009). Businesses usually recognize these limitations people have, which may explain the high frequency of contracts with automatic renewal in the newspaper, credit card, and mail order industry (DellaVigna and Malmendier, 2006).

All these examples of poor decision making are characterized by distortions induced by costly information acquisition and imperfect attention. Inattention models introduce the idea that people's abilities to translate external data into action are constrained by a finite capacity to process information. Better information and more time dedicated to process that information leads to better outcomes. But gathering and processing have non-trivial costs, which explains why agents make so many decisions based on imperfect information.¹ Many behavioral biases reflect a form of inattention. For example, hyperbolic discounting implies inattention to the future, overconfidence can be described as inattention to my true ability, and even left-digit bias can be modeled as inattention to the right digits (Gabaix, 2017).²

Considering the limited cognitive abilities of individuals, third parties may be able to reduce the cost of acquiring and processing information, and provide a framing that encourages better decision-making. For example, when the government provides a clear example of the financial effect of accumulating interests on unpaid taxes, compliance tends to increase (Castro and Scartascini, 2015a). Drawing attention to fees for overdrawn accounts reduces the likelihood that the individual will incur the fees the following month (Stango and Zinman, 2014). But not all information changes behaviors in the right direction. Advice given

¹Limited attention and cognitive costs tend to be particularly taxing for those who have depleted willpower, more costly access to information, and lower bandwidth, such as the poor (Mullainathan and Shafir, 2014).

²In this paper we do not differentiate among the different forms of inattention. Results do not change if we follow a purely rational or a behavioral model of inattention.

to potential beneficiaries of the EITC did not change their behavior in the intensive margin (Chetty et al., 2013). Some information given to taxpayers did not change their behavior (Castro and Scartascini, 2015b). Therefore, third parties, such as the government, should provide not only information but also salient and actionable information to reduce the degree of complexity of the cognitive tasks.

In this paper we evaluate the role of inattention and cognitive abilities in the particular context of a tax amnesty. The aim of the paper is to understand the role of salience and clarity of information for the effectiveness of a public policy. By doing so, we can also evaluate the effect of tax amnesties on the behavior of good taxpayers. In order to meet these goals, we run a field experiment in the city of Santa Fe (Argentina). In the experiment, we work with more than 54,000 taxpayers who had failed to comply with the payment of their property tax bill (they received the bill but they did not make a payment).³ Every quarter, the taxpayers who owe money receive a notice from the government about their non-compliant behavior (a summary of the payments they have missed, the accumulated debt, and where to pay it). When a tax amnesty is open, the government uses these notices as one of the ways to inform taxpayers. For the intervention, we redesigned these notices so they are more salient -use of color and other visual techniques- and easier to understand; they provide an explanation of the different payment plans they can select to cancel their debt -including a detailed computation of the reduction in interests that each payment plan provides. Our policy intervention goes beyond providing information that a tax amnesty exists, which is the same for everybody. We aim to reduce information processing or cognitive costs.

The implications of inattention and costly information acquisition models have been evaluated extensively in the lab (Masatlioglu et al., 2012; Caplin and Dean, 2013; Caplin and Martin, 2015; Knoepfle et al., 2010; Krajbich et al., 2010; Reutskaja et al., 2011; Arieli et al., 2011; Costa-Gomes et al., 2001; Costa-Gomes and Crawford, 2006; Brocas et al., 2014; Hare et al., 2011). There are many studies that evaluate inattention in consumer decision making, such as Allcott and Wozny (2014); Chetty et al. (2009); Dellavigna and Pollet (2009); Lacetera and Sydnor (2012) but there are very few in other areas. Most field interventions are focused on evaluating the purely informative channel instead of providing the same information but reducing the cognitive costs for the individual to process that information. This is the case, for example, in the area of taxation (Mascagni, 2018). We procure to fill that void.

In addition to evaluating the role of inattention, we also assess the role of tax amnesties

³Working with the property tax has the benefit that there are no informational asymmetries between the government and taxpayers. The government tells what the taxpayer has to pay and the taxpayer decision can only be whether to pay not what she owes.

as a policy tool.⁴ Tax amnesties are broadly used across countries and states because they generate short-term revenue gains and they could add new taxpayers to the system (when they are targeted to those in the informal economy). Moreover, in contexts in which taxpayers have racked up large amounts of debts, tax amnesties can provide taxpayers with a clean slate that could encourage better behavior in the future, particularly in the context of stricter enforcement. Consequently, under certain conditions, tax amnesties can be successful (provide high short term revenues and increase the number of taxpayers) (Andreoni, 1991; Malik and Schwab, 1991; Le Borgne and Baer, 2008; Garz and Pagels, 2018). They tend to be more common during periods of fiscal stress and after deep institutional changes (Ross and Buckwalter, 2013; Bayer et al., 2015).

Introducing tax amnesties has its own costs (Le Borgne and Baer, 2008). On the one hand, there is a cost stemming from administering the amnesty and the foregone tax revenues. On the other, there is the potential reduction in tax compliance: (i) the possibility that new amnesties will happen in the future reduces the cost of non-compliance today; (ii) amnesties, and the differential treatment for compliant and non-compliant taxpayers, reduces confidence in the government for the former and their tax morale. The existing empirical evidence, mostly coming from comparisons across the US states, suggests that tax amnesties help to increase short-term revenues but they have negative long-term consequences on compliance, particularly when tax amnesties are recurrent (Ross and Buckwalter, 2013; Luitel and Sobel, 2007; Shevlin et al., 2017). To the best of our knowledge, field experiments that look at the effect of tax amnesties for recovering debt and can evaluate causally the impact on tax compliance are non-existing. The reason is very simple. Government's can't exclude some taxpayers from the benefits. In our case, by exploiting the existence of inattention, we can start to explore the link between amnesties and compliance experimentally.

Evidence from the field experiment we conducted in Argentina indicates that increasing the salience of the messages and reducing the cognitive costs to process the information provided by the government affects people's likelihood to pay their outstanding liabilities. Basically, taxpayers that received the information about the tax amnesty on a clear and salient manner paid on average 5% more than those who received the traditional notice. Adding a computation of savings by plan -which reduces cognitive costs- slightly increases collection to 6%. Interestingly, because this new information allows taxpayers to compare better between different plans and it makes more salient their relative benefit, it seems to bias decisions marginally towards the choice of single installment plans. Adding a more

⁴A tax amnesty is a limited-time opportunity for a specified group of taxpayers to pay a defined amount, in exchange for the reduction of a tax liability (including interest and penalties) relating to a previous tax period or periods. In our case, the amnesty offered by the government provides a reduction in the accumulated interests but no benefits related to the capital.

noticeable notice about the potential judicialization of unpaid liabilities increases collection by 8% when compared to those who received the traditional notice.

Increasing the salience of the tax amnesty could come with a cost. When people learn more about the implications and benefits of the amnesty, it could generate negative incentives for paying the current tax bills. We find that people who received the more salient and clear notices reduced marginally the likelihood of paying the new bills. The effect is significantly larger when we consider the spillover effects on historically compliant taxpayers. Increasing the share of people living in the same geographical block that received a new notice by 10%, increases the probability of non-payment for the previously compliant taxpayer by about 0.6pp.⁵ This result provides causal evidence that tax amnesties should be introduced with caution as they may generate negative incentives on traditionally compliant taxpayers. It also indicates that providing clear and salient information can help the government to increase collection in some margins but reduce revenues in others.

The paper is organized as follows. Section 2 presents the conceptual framework and literature review, section 3 focuses on the institutional background and the intervention design, section 4 describes the data, section 5 presents a discussion of the empirical results. Finally, section 6 concludes.

2 Conceptual framework

Classical models with rational agents assume that agents know everything they need and can process the information at no cost. However, what is often observed in the real world is that agents make decisions without using all the information they have at their disposal. Introducing information costs into the decision problem can potentially explain many of the biases in decision making documented by the cognitive bias literature (Kahneman et al., 1991). Costly information may affect the way agents understand a problem, and the heuristics and intuitions they use to solve them.

Inattention models are based on the idea that information acquisition involves tangible and intangible costs. All agents use cognitive resources to make decisions, and cognitive limitations and biases cause decision makers to ignore available options (Stigler, 1961; Pessemier, 1978; Chiang et al., 1998). The idea of inattentive decision makers has a long history in the literature in marketing and psychology. Hauser and Wernerfelt (1990) and Roberts and Lattin (1991) provide some evidence that consumers do not consider all the available choices.

⁵This effect measures only the marginal effect of having relatively more information in the network of taxpayers (geographical block). We can not evaluate with our strategy the overall level effect that opening a tax amnesty has on the overall population.

More recently, Sims (2010) explains that agents translation of observed external random signals into actions is conditioned by a finite rate of information flow or limited capacity. Formally, the economic agent decides not only over actions that produce benefits directly but also on the amount of information that she needs to make such a decision. In this case, not all the freely available information is used because processing information is costly, and the portion of used information is transmitted stochastically, so mistakes are possible.

Chetty et al. (2009) sales tax example provides a very easy introduction to the idea. Basically, if the full price of a good is $q = p + \tau$, where p is the price and τ is the sales tax, but if the tax is not posted in the price, the consumer may only perceive a fraction of the tax $\tau^s = m\tau$. In that case, the consumer's consumption decision will be based on an estimated total price $q^s = p + m\tau$. In some cases, this decision or the sum of these decisions, could mount to a large misallocation of resources. Gabaix (2017) presents several other examples of behavioral biases that can be expressed in a similar way. For example, the left-digit bias, which has been shown to exist in many consumer decisions ((Lacetera and Sydnor, 2012)), for a number $x = a + b/10$, with $a \geq 1$ and $b \in [0, 1)$ can be expressed as $x^s = a + m\frac{b}{10}$. The individual gives full attention to the left digit but not to the right one. Left-digit bias helps explains why so many prices are posted in the format \$x.99. In every case, the individual could observe or compute the final price but most people make decisions with some degree of inattention.

For simplicity, we use the same concepts to introduce inattention in the context of a tax amnesty in a very reduced form model that evaluates the decision to cancel the existing debt.⁶ In this model, we assume that most of the parameters are given, as well as the equilibrium strategies of searching for information. As such, we are going to evaluate the simple effect of providing better information by a third party into a very stylized tax amnesty decision model.

Consider an individual taxpayer decision in a single-period setting who maximizes her expected utility from disposable income by choosing whether or not to pay the debt she owes during a tax amnesty, T_d . The agent has a level of income Y . If the taxpayer is prosecuted because she failed to pay, which occurs with probability p , she has to pay a penalty $f > 1$ over the amount of debt T_d . On the other hand, if the taxpayer is not prosecuted, which occurs with probability $(1 - p)$ she can enjoy her full income. While the enforcement probability is a deterministic number known only to the tax authority, we assume that individuals' perceptions about p are heterogeneous ($p \sim F$).

Unlike a traditional model in which individuals decide how much to declare, this is a case in which the taxpayer only chooses whether to pay or not what she owes. Therefore,

⁶We do not include in the model the decision about the contemporaneous monthly payment.

taxpayers can choose between complying (paying the owed amount) and not complying. The value of having an opportunity to pay what she owes is equal to:

$$\pi = \max[U(Y - T_d), (1 - p)U(Y) + pU(Y - fT_d)] \quad (1)$$

Individuals will choose to pay their tax debt if the left side of the maximum operator in equation 1 is no less than the right side. The optimal choice can be illustrated in the left panel of Figure 1. Individuals with perceptions $p > p^*$ will pay the tax they owe and those below will not. The proportion of individuals who pay what they owe is equal to $[1 - F(p^*)]$, and the proportion who does not equals $[F(p^*)]$.

One way to increase the share of people who cancels their debt is by introducing a tax amnesty that reduces the cost of the debt. We introduce the amnesty with the parameter $a < 1$. Basically, during the tax amnesty the government reduces the amount owed by a . Therefore, the taxpayer's decision problem becomes:

$$\pi_a = \max[U(Y - aT_d), (1 - p)U(Y) + pU(Y - fT_d)] \quad (2)$$

The right side of the maximum operator remains the same, while the left side is now more attractive because the cost of paying is now lower (right panel of Figure 1). Individuals with perceptions $p > p_{*a}$ will pay what they owe and those with $p < p_{*a}$ will not. Because $[1 - F(p_{*a})] > [1 - F(p^*)]$, a tax amnesty will increase the number of people who decides to pay down their debt. A share of people $[F(p_{*a})]$ still prefers not to pay in spite of the amnesty.

However, this model assumes that people know that the tax amnesty exists and they can compute the benefit a . In a model of inattention, people do not know the true a but they estimate it according to the information they have access to. For simplicity, let's call a^s the estimated a , $a^s = m.a$, and let's assume that $a^s \in [a, 1]$. Believing $a^s = 1$ implies having no information about the tax amnesty. Those who estimate $a^s = a$ will internalize the full benefit of the tax amnesty. Therefore, the share of people paying what they owe will be increasing in the information about the amnesty: $[1 - F(p_{*a})] \geq [1 - F(p_{*a^s})] \geq [1 - F(p^*)]$. Assuming that taxpayers are homogeneous in their ability to process information, their ability to estimate a would depend only on the cost of gathering the information. More salient and clear information should reduce the cost of gathering information; hence, it should improve the estimate of a , $[(a^s - a)|D] < [(a^s - a)|C]$ where D is treatment and C control. Since individuals in the treatment group should be better at estimating a , we would expect an increase in the number of people who pay their debt: $[1 - F(p_{*a^s})|D] \geq [1 - F(p_{*a^s})|C]$

3 Background and Experimental Design

The Municipality of Santa Fe is the eighth largest city in Argentina (it has a population of about 391.000 residents according to the last census). It is the capital city of the Province of Santa Fe, which is the third most populated province in the country. The Municipality collects real estate property taxes, which are locally called Tasa General de Inmuebles (TGI). Almost all real estate properties are taxed, including homes, vacant lots, and business premises. Taxes are proportional to the properties' assessed values. Since 2012, the assessed values are computed according to a formula that includes several components; some are common for the entire city, some are district specific, and some are taxpayer specific. Basically, the property assessment considers three dimensions: (i) a coefficient of land price (district specific) multiplied by the land area of the property in square meters (taxpayer specific); (ii) the size of the built-up area of the taxpayer's property (taxpayer specific) multiplied by the construction price per square meter (city-wide value established according to the construction costs index published by the College of Architects), and; (iii) the public services (trash collection, street lighting, etc) that each property has access to. Property tax rates are identical for all properties within the city. Every year the city establishes a minimum property tax (floor tax) which varies by district.

Taxpayers receive a monthly bill that indicates how much they have to pay that month. However, delivery of the bills takes place every 3 months. That is, every quarter each taxpayer receives at the same time the bills necessary to pay the following 3 months (e.g., at the beginning of January the property owner receives 3 bills; one of the bills corresponds to January, one to February, and one to March). Each month, tax bills are due around the 10th day of the month. As such, since the moment they receive the bills, property owners have approximately 10 days to pay the first bill, 40 days to pay the second, and 70 days to pay the third bill. Late payments are charged a compound monthly interest rate of 3%. Late fees for each bill cannot be larger than 3 times the original tax liability (e.g., for a AR\$50 unpaid tax bill, the maximum amount of accumulated interest is capped at AR\$150). If the taxpayer does not pay the outstanding bill and accumulated interests, the city government can proceed to send them to judicial enforcement. Given that the city government has limited resources, this process tends to be reserved to taxpayers who have the oldest tax liabilities because if the City Government does not initiate a judicial process, debts prescribe after 5 years. Taxpayers can not have outstanding liabilities in order to sell a property.

3.1 Tax Amnesties in Santa Fe

Many governments engage in tax amnesties from time to time to collect taxes from delinquent taxpayers. A tax amnesty offers a time-limited opportunity for taxpayers to file late tax returns and regularize their outstanding tax liabilities and come into compliance. During tax amnesties, governments usually offer the enticing benefits of paying back taxes with interest and/or penalties reduced or waived. These programs tend to be a successful tool to collect taxes from non-compliant taxpayers in the short-run and tend to be particularly fruitful when they are used as a complement to new or tougher enforcement campaigns. However, if they are used too often, they may backfire in the long-run because they create a moral hazard problem (Alm et al., 1990).

The government of the City of Santa Fe has implemented several tax amnesties despite the concerns that repetitive tax amnesties could hinder their success to collect debts and reduce compliance. Tax amnesties took place in September 2013, June 2015, and May 2017. We implemented our intervention during that last amnesty.

These tax amnesties in the city, formally called “debt regularization programs”, reduce the amount of interests accumulated, but they do not reduce the amount of capital owed. During a program, the city provides taxpayers with a menu of payment plans. Each plan offers different conditions, about the share of forgiven interest charges, term, down-payment, and financing interests.

During the 2017 program, taxpayers could choose from five alternative payment plans, which are described in Table 1:

Table 1: Menu of payment plans

Plan “single installment”:	Only one payment. No financing costs. Reduction of the interest rate on late payment from 3% to 0.75%, a discount of 2.25 percentage points (75% reduction).
Plan A:	Up to six payments. No financing costs. No reductions in the accumulated interest.
Plan B:	A 20% down-payment, and up to 12 monthly payments. Financing cost of 1% monthly. Reduction of the late payment interest rate of 2 percentage points (66.66% reduction).
Plan C:	Up to 18 monthly payments. Financing cost of 1.5% monthly interest. Reduction of 1.5 percentage point (50% reduction) in the late payment interest rate.
Plan D:	Up to 24 monthly payments. Financing cost of 2% monthly. Reduction of one percentage point (33.33% reduction) in the late payment interest rate.

As described in Table 1, each plan comes with a different combination of financial incentives and number of payments (from one payment to 24). Taxpayers who decide to participate in the program should rationally choose the plan that provides them with the highest financial incentive given their credit constraint (how much they are able to pay).

There are two additional restrictions. First, only taxpayers who owe three or more tax bills can participate in the amnesty. Second, the minimum payment in each one of the plans is AR\$300. For instance, a taxpayer who owes less than AR\$600 can only choose the single installment option. Only those who owe AR\$600 or more can choose any of the payment plans but none of their installments can be less than AR\$300.

Table 2 presents the proportion of taxpayers by tax debt amount. About 15% of the taxpayers owe less than AR\$600. About half of the sample owes less than five times the minimum monthly payment and about a quarter of them owe more than 18 times the minimum payment. Table 3 presents the summary statistics for the monthly tax bill for different intervals of debt size. The values in Table 3 show that the minimum payment is a binding restriction and it is quite larger than the monthly tax liability. For instance, for the group that owes between AR\$3,600 and AR\$5,400, the AR\$300 minimum payment represents on average more than two and a half times the monthly tax amount. If people are credit constrained, this requirement could reduce significantly the number of people who joins a payment plan.

3.2 Experimental design

As we mentioned in the introduction, the aim of this field experiment is to evaluate whether reducing information processing costs has an impact on the decision that individuals make in the context of a tax amnesty.

Figure 5 shows an example of the formal notification, called Overdue Tax Collection (or “Cancelación de Deuda Atrasada” in Spanish; from now on referred as CDA), the city government traditionally used (in this particular case, during the 2015 tax amnesty.) As it can be observed in the example, this instrument has several potential shortcomings to convey useful and actionable information. First, the CDAs look exactly the same whether there is a tax amnesty or not. Therefore, the tax amnesty is hardly salient for most delinquent taxpayers. For instance, the taxpayer in the example in Figure 5 had not paid any tax bill in the last 5 years. As such, she would have received a very similar CDA about 20 times already - every quarter for the last 5 years. Second, while the CDA shows the benefit of paying in one installment (in the example, the taxpayer could identify the total debt, AR\$11366.63, and the amount to be paid in one installment, AR\$7178.67) it may be relatively difficult for most

people to compute and compare the benefits of each one of the other plans: (i) the language is fairly complex; (ii) it does not provide information about how much of the debt is due to capital and how much to interests (which are subject to potential reductions); (iii) the taxpayer has to compute for each plan the benefits coming from the reduction of interests on the unpaid bills and the financial costs coming from financing the payments (e.g., in Plan B, there is a reduction of interest on the unpaid bills from 3% to 1% but at the same time a 2% monthly interest on the installments to be paid under the plan); (iv) the taxpayer has to take into account the constraint that each payment has to be equal or higher than AR\$300 when computing the number of payments and the financial cost that it entails. Consequently, the traditional instrument used by the city makes it very costly for taxpayers to evaluate the true benefits of the tax amnesty. Improving the CDA, by increasing the salience of the tax amnesty and reducing computational costs, should make it easier for people to compute the true benefits of joining the amnesty.

The field experiment consists of two interventions. The first intervention includes those taxpayers who owe bills that include the months from January 2011 to December 2012 too (about 16,000 taxpayers). The reason to split the sample is that because those old debts would prescribe absent any action, the city government decides to send those taxpayers who do not pay to judicial enforcement. As such, the CDA serves the additional purpose of informing that absent any payment that action would take place. This group of taxpayers is divided into two groups. The control group (C) receives the “old CDA”, which has been in use for several years and most taxpayers have grown accustomed to it (Figure 5). This CDA includes a deterrence message that says (original in Spanish) “If you decide not to pay your outstanding debt, your account will be assigned to judicial enforcement”. The Treatment 1 (D_1) group receives a redesigned CDA: (i) it is printed in color and is more visually appealing, which makes it more salient; (ii) information in the message is better distributed and relevant messages are highlighted in bold; (iii) there is a better description of every payment plan -each of them is compared in an easy-to-follow table that describes the maximum number of installments, down payment requirements, financial interests, and the reduction in the interest on the unpaid bills; (iv) includes a column in the table where the amount of interest saved under each plan is computed. This information is personalized for each taxpayer; (v) the deterrence message is highlighted in red. Figure 6 presents an example of the treatment. Again, the informational content is exactly the same for the treatment and control groups. What varies is the salience and the cost for the taxpayer of processing the benefits that the tax amnesty provides.

The second intervention includes those taxpayers who have accumulated debt in some or all periods between January 2013 and March 2017. This group of about 37,000 taxpayers is

randomly divided into three groups. The first group is assigned to the control group (C). The taxpayers in this group receive the “old CDA” (Figure 5). The Treatment 1 of this intervention (D_2) group receives a redesigned CDA: (i) it is printed in color and is more visually appealing, which makes it more salient; (ii) information in the message is better distributed and relevant messages are highlighted in bold; (iii) there is a better description of every payment plan -each of them is compared in an easy-to-follow table that describes the maximum number of installments, down payment requirements, financial interests, and the reduction in the interest on the unpaid bills. Figure 7 presents one example. The Treatment 2 of this intervention (D_3) group receives a new CDA that includes another column to the table, in which the amount of interest saved under each plan is computed. This information is personalized for each taxpayer. See Figure 8 for an example. Because administrative reasons, we could not compute the amount in financial interests each taxpayer would have to pay because that would depend on the number of installments each taxpayer chooses under each plan.⁷ As such, while it reduces the cost for the taxpayer to compute the savings in one dimension it may obscure the total benefit of each plan absent similar calculations about the financial cost that each payment implies. This could potentially bias decisions. Importantly, because the savings tend to be substantially lower for the payment plans than for the cash option, presenting these computations explicitly could deter some people from choosing a payment plan. Additionally, it is also important to note that each CDA includes a payment stub to make the single installment payment. Therefore, while those who decide to pay the single installment can go straight to a bank and make the deposit, those who want to pay off their debt using a payment plan have to register online to get the corresponding payment stub or visit the city government offices. Since the transaction costs are much higher for those who would prefer a payment plan, even though the CDA informs clearly the taxpayer the procedure to follow, this could hinder their adoption.

4 Data

We have access to administrative data from the Municipality of Santa Fe. We work with three sets of data. The first data set contains some characteristics about the property such as the size of the construction, its valuation for tax purposes, and public services that the property receives (public water, gas, sewerage, street lighting, garbage collection). The second dataset contains information about unpaid tax bills from January 2011 to December 2016. The data also include information about each taxpayer’s decision to join the amnesty; the payment

⁷The city government did not want us to compute and advertise a hypothetical amount based on the maximum number of installments for each plan.

plan that was selected, and the date of payment for each bill during the following five months since the amnesty was open (May 9, 2017) regardless of whether the taxpayer joined or not any amnesty plan. Finally, a third data set contains information about the current tax bills between January and October 2017.

For the assignment to control and treatment groups we removed from the universe of taxpayers those who had no debt and those who only owed after March 2017. These two groups could not be part of the amnesty. We ended up with about 54,000 taxpayers. Because these taxpayers are highly heterogeneous, we divided the sample into strata according to their compliance during the period of interest (2011-2017). Having debt from 2012 or before makes a strata by itself because of the way we divided the interventions. The other three are composed by those who paid less than 10% of their bills; those who paid between 10% and 90% of the bills, and; those who paid 90% of the bills or more. During the randomization, we run 1,000 iterations to select a random draw that shows the best balance for all the pre-experimental variables using two criteria: (i) the minimum difference in the average of treatment and control groups, and (ii) the maximum standard error for this difference. The combination of both criteria leads to the highest t-statistic of the difference between treatment and control group. The set of pre-experimental variables used for balancing includes the size of the lot (in m^2), size of the building (in m^2), amount of the tax bill for March 2017, and the average monthly compliance rate between 2011 and 2017. Tables 4 and 5 show that there are no statistically significant observable differences between the treatment and control groups for both interventions.

5 Identification and Results

To evaluate the effect of the new instrument in participating in the tax amnesty, we estimate the following linear model.

$$Y_{vi} = \alpha D_{ji} + X_i\beta + Z_i\Gamma + \mu_i, \quad (3)$$

where X_i is a matrix of time-invariant characteristics of property i (size, fiscal assessment, and public services), Z_i is a matrix of characteristics of the tax liability of the property (total debt and age), D_{ji} is an indicator that takes the value of one if the property was selected to receive treatment j (Old CDA or any of the new CDAs), and μ is an idiosyncratic error term. Standard errors are clustered at the individual level. α is the coefficient of interest, which estimates the difference between the treatment D and control groups, and measures the causal effect of the new instruments on the outcome Y_v . We look at four different

outcomes: (i) the amount of debt paid (in logs), (ii) a dichotomous variable indicating the decision of joining an amnesty plan; (iii) a dichotomous variable indicating the decision of joining the single-installment amnesty plan, and; (iv) a dichotomous variable indicating the decision of joining any other plan.

We estimate Equation 3 with OLS and report results in Table 6 (first intervention) and Table 7 (intervention 2). In Table 6, each column compares the effect of the treatment D_1 , *New CDA*, against the control group C , *Old CDA*. Each column shows the results from specifications that include different control variables. Each row displays the estimates of α for different outcome variables ($Y^v, v \in \{a, b, c, d\}$): amount paid (in logs), taxpayer registers to any plan, taxpayer registers to the single installment plan, taxpayer registers to any other plan. It is important to note that our results are most likely a lower bound of the effects given the credit constraints and transaction costs described earlier, and the fact that there are other ways in which the government advertises the existence of the tax amnesty (newspapers, local TV and radio stations, etc) that affect both the treatment and control groups equally. It is also important to note that the size of the effect can not be very large by the nature of the intervention even if people in the treatment group become fully informed and people in the control group remain largely ignorant. The effect will be bounded between the decision made by fully informed individuals about the amnesty and the decisions taxpayers make when no amnesty is present: $[1 - F(p*_a)] \geq [1 - F(p*_a^s) | D] \geq [1 - F(p*_a^s) | C] \geq [1 - F(p*)]$

In Table 7, the first three columns compare the effect of the treatments D_1 , *New CDA*, and D_2 , *New CDA with interest discounts*, against the control group C *Old CDA*. The next three columns use D_1 as the base category for comparisons.

5.1 Direct effects of the intervention

Our estimates for α are positive, statistically significant, and robust across specifications. Those who received any of the new CDAs paid more. In the first intervention, Table 6, the effect of the treatment is positive and statistically significant. There is an increment of 8% in the amount collected compared to the control group. In terms of joining a plan, taxpayers in the treatment group are 1 percentage point more likely. This is equivalent to an increase of almost 30% in the likelihood of joining the amnesty. The results are driven mostly by people choosing the single installment plan (an increase of 31% over the control group). We find no significant effect in the probability of joining any other plan. As we mentioned before, there are two issues that conspire against joining a plan. First, providing the information about savings per plan decreases the cognitive costs of computing the savings but it makes more salient the relative benefit of paying in a single installment. Second, there are higher

transaction costs for joining a installment plan compared to paying in a single installment -payment coupon is provided with the CDA.

Table 7 presents the results for the second intervention (younger debt, no judicialization message). The effect of the treatments on the amount collected is between 5 and 6 percent higher than for the control group. 5% is a substantial increment in collected taxes. The amnesty helped the city to collect about AR\$13 million, which represents USD\$1 million of the time, and 10% of existing tax liabilities. In terms of the decision to join the amnesty, taxpayers in the treatment group are about 0.6 percentage points more likely to do it than those in the control group, which implies an increase of about 7%. Again, most of those who decided to join did it so by selecting the single installment option. The CDAs were not successful in getting more taxpayers to select any other plan (probably because the transaction costs to do it were too high). The differences between the two treatments are not statistically significant. If anything, it seems that the second treatment reduced slightly the willingness of taxpayers to participate in other plans. Most probably, the fact that taxpayers could now compare better the differences between the amount saved in the single installment plan and the other plans -which is large- could explain that result. This finding is consistent with choice anomalies in the marketing literature described by Masatlioglu et al. (2012). Basically, the other plans seem to act as a decoy and make the single installment plan more attractive to taxpayers. Still, because of credit constraints, that higher preference could not effectively materialize in more payments.

The evidence seems to be compelling to show that the coding of the message, in terms of its salience and simplicity has a positive effect on tax compliance. Both the control and treatment groups received the same information regarding the benefits and conditions of the tax amnesty. However, a better coding increases the number of taxpayers that respond to the tax amnesty. Of course, we are aware that the overall effect of the tax amnesty was modest. There are several reasons for this. First, as shown in the model, the tax amnesty would only affect the marginal taxpayers (particularly when the benefits of the amnesty are not very large, *a* close to 1, as it was the case in Santa Fe). Second, we are not evaluating the effect of the amnesty but the marginal effect of better coding of the messages used to inform it. Third, there are other sources the government uses to publicize the amnesty. Fourth, this was not the first and surely not the last amnesty the government was offering, which reduces the incentives to join. Fifth, the minimum payment established for each payment plan was several times higher than the monthly tax bill. As such, many people could not afford making use of the amnesty. Sixth, while it was relatively simple to pay under the single installment plan, the transaction costs for any other plan were higher, which compounded the problem.

The fact that Treatment 2, which includes the computation of the savings, does not perform better than Treatment 1, is also a telling result. On the one hand, more information could help taxpayers make better choices as it reduces the cost of making part of the computations (Chetty et al., 2009). Therefore, we would expect that it reduces the information asymmetry and increases payments. On the other, this would be true only if the information is actually relevant for decision making. In this case, it seems that it wasn't for several reasons: (i) given the transaction costs, most people may have not been interested in the individual plans; (ii) people still needed to be able to compute financial interests on the number of payments that was compatible with the minimum payment restrictions. As such, for those who could do those computations, the additional information was meaningless as they could also compute those savings; (iii) the additional information in Treatment 2 about the savings per plan may have increased instead the salience of the benefits from the single payment plan. Now, taxpayers could evaluate more easily the relatively higher benefits of that plan against the others, which could have refrained those with credit constraints from registering in the tax amnesty.

Once more, the evidence seems to be consistent with the fact that salience and information matter but only when the information is relevant and actionable, and reduces the uncertainty of the decision maker. The stronger results for the treatment in intervention 1 compared to those in intervention 2 are consistent with the tax literature showing that the threat of judicial actions can effectively increase tax compliance.

5.1.1 Heterogeneous Results

As we have mentioned, there are reasons to believe that credit constraints may have played a big role in decision making. First, the restriction imposed by the municipality of a minimum payment of AR\$300 could have been binding, as it was several times larger than the monthly bill. Second, both D_1 and D_3 , by highlighting the differences in savings between the payment plans and the single installment plan, may have reduced the interest of taxpayers for the latter. In the context of credit constraints, some taxpayers may have preferred to ignore the amnesty if they could not access the most beneficial option.⁸ We can evaluate these hypotheses by looking at the heterogeneous effects of the interventions.

Taxpayers differ in several dimensions. First, the amount of debt varies substantially. While 15% of the taxpayers owe less than AR\$600, 20% of the taxpayers owe at least 9 times more. The number of missed payments differs substantially too, but the distribution is not necessarily the same as the amount owed. Some people have missed many payments

⁸Choosing a payment plan instead of the single installment looks like a loss, and there is plenty of evidence in the literature about the consequences of loss aversion biases in decision making.

of small amounts while others owe a large sum based on a few missed payments. This difference is sustained by a large heterogeneity in the fiscal assessment of the property, which may be a proxy for wealth.⁹ While these variables present a coarse approximation to the characteristics of the individual taxpayers, their combination could help us disentangle some of the mechanisms behind the results. In particular, whether some of the results may be affected by cash constraints.

In order to address this question we estimate the effect of the interaction between D_j and the mentioned variables: total unpaid liability, the number of unpaid bills, and the fiscal assessed value of the property. Formally, we estimate the following linear model.

$$Y_{vi} = \alpha_0 D_{ji} + \alpha_1 D_{ji} * x_i + X_i \beta + Z_i \Gamma + \mu_i, \quad (4)$$

Where x_i is one of the three variables we mentioned above, and the total effect of the treatment α is decomposed in the components α_0 and α_1 . The latter represents the effect of increasing x_i while being treated over the outcome variable Y_{vi} . We present the estimation results in Tables 11 to 9.

Results for total unpaid liabilities are summarized in Figure 2. Each column presents the results for each dependent variable (amount paid, accepts single installment, accepts any other plan). Each row presents the results for each treatment. The first row in each figure presents the results for the treatment in the first intervention. The following two rows present the results for treatments 1 and 2 of the second intervention. The same structure applies when we interact the treatments with the other independent variables.

As it can be observed in the first row of Figure 2, it seems that the fear of the judicialization of the debt acted like a more stringent deterrent for those who had higher debts with the city government. The following two rows compare the results for the treatments in the second intervention. The marginal effect of Treatment 1 tends to be relatively constant. That is, there is no evidence that the better coding of the message is particularly more relevant for any particular group. However, Treatment 2 seems to be particularly significant for those in the lower tail of the distribution. Taxpayers who owe less money are particularly drawn to pay their liabilities in a single installment. Again, it seems that the additional information served as a decoy that made the single installment plan look better.

In Figure 3, which shows the marginal effects of the treatments according to the distribution of unpaid bills, the group of taxpayers with fewer number of unpaid liabilities react more to the treatment in the first intervention. Results are very similar than before for the second intervention. Again, the computation of interests seems to act as a decoy in favor of

⁹In Latin America, and in Argentina in particular, fiscal valuations are not as good a measure of wealth and income as in the US because property values are less accurate and there is no mortgage market.

the single installment for those who had less to pay, hence lower cash constraints.

Figure 4, which shows the marginal effects according to fiscal valuation, seems to square off the evidence. The treatments that include the computation of the savings in both interventions tend to have a larger effect on those with higher fiscal valuations. Therefore, cash constraints may have a big role on the payment decisions.

Summarizing, the evidence seems to indicate that: (i) making explicit the savings for each plan tends to have a decoy effect that favors single installment payments (the marginal effect on single installments is much higher for Treatment 2 than Treatment 1); (ii) the cash constraint is binding when no threat is present (those who react more in the intervention 2 are those with lower debts, fewer unpaid bills, but higher fiscal assessments); (iii) inattention seems to affect people with higher financial status too (those with higher fiscal assessments react more to the treatments than those with lower ones); (iv) taxpayers seem to understand that the probability of enforcement may increase with the size of the debt (in the first intervention -judicialization, it is those with higher debts who react more).

5.2 Effect of the amnesty on current payments

Tax amnesties are a tool to collect outstanding debts in the short-run. However, they can generate moral hazard problems. If people realize that the government will provide payment plans in the future, they may react by reducing their payments today.¹⁰ Consequently, it is important to evaluate the direct effect of the intervention on the payment of current bills. The empirical specification is the same as in Equation 3, but applied to the tax bills of 2017. Now, the outcome variables are a set of dichotomous variables such as: “paid when the amnesty was open”, “paid on time”, “paid within a month delay”, “paid with more of a month delay”, and “payment has not been made by October 2017”. The unit of observation is the monthly bill so the data is structured in a balanced panel where each taxpayer appears each month from January to December 2017.¹¹ We don’t necessarily expect very large results given that we are not evaluating the effect of an amnesty on payment behavior. Instead, we are evaluating the effect of the differential informational content of the instruments used to inform debtors about the existence of the amnesty; and this intervention takes place in an environment in which the government uses a variety of communications methods to publicize the amnesty (traditional media, social media, etc).

¹⁰One easy way to model this for the payment decision of an individual tax bill is to add to the decision process of the individual a lottery over the probability that an amnesty would be enacted in the future. Now, the taxpayer would evaluate the utility from paying with the a lottery that is determined by both the probability of an amnesty and the probability of being prosecuted if she does not pay.

¹¹The municipality allows individuals to pay the whole year in advance. This behavior is encouraged by offering a discount equivalent to one month of taxes.

Table 14 and Table 15 present the results for these estimations. It is important to notice that the sample of individuals who were eligible to participate in the amnesty usually do not pay their taxes, and if they do it, they do it with a delay. For example, the compliance rate with their current tax bill for those in the second intervention is around 12%. As such, differences between treatment and control would be small by design.

For both interventions, we observe that the intervention has little effect on the payment of current bills for traditionally non-compliant taxpayers during the period in which people could register for the tax amnesty. There seems to be an increase in non payments for those who received the treatments that include the computation of savings. That is, those who receive the description of savings for each plan seem to be less likely to pay the current bills by about 0.3pp to 0.5pp. It is important to note that given that the compliance rate for those in the second intervention is around 12%, a reduction in payment of 0.5pp is equivalent to a drop in compliance of more than 4% for that group. This effect seems to be explained by a reduction in those who pay their bills with a month delay. Now, instead of paying with a delay they seem to be avoiding paying at all. Given that this result holds for the new CDAs that include the computation of the savings, a possible explanation is that people who tend to accumulate small amounts of interests realize that the cost of not paying would be lower than they had estimated given the benefits that a tax amnesty provides. Part of the result could also be explained by credit constraints. Those who decided to join the amnesty and pay what they owe have fewer resources to pay the current bill.

5.3 Spillover effects of the intervention

So far, we have looked at the effect of the differential informational content and salience of the CDAs for those who tend to avoid paying their taxes and accumulate debt with the city government. We have shown that the information content affects the likelihood that a taxpayer would enter into an amnesty to pay off her debts. We have also shown that there could be a slightly negative effect on current payments for marginal taxpayers. The tax amnesty could also have an effect on those who pay their taxes regularly (non tax debtors). For example, they may realize that the cost of not paying may be not as high as they had predicted and that the threat of enforcement is not as real. As such, the government's threat of punishment loses credibility. Moreover, compliant taxpayers may also behave resentfully by having fulfilled their duties while delinquent taxpayer receive deductions, which reduces tax morale (Luttmer and Singhal, 2014).

While we can not evaluate the overall causal effect of having an amnesty in the city, we can evaluate the effect of the salience of the instruments used for advertising them. We

expect that if the amnesty is more salient, the negative spillover would be larger. One option for estimating the spillover of the tax amnesty on those who are compliant taxpayers would be to use as a treatment variable whether there is somebody in the vicinity of the taxpayer who receives a CDA. However, given the scope of our intervention, we only have a reduced number of blocks in the city where no taxpayers received a CDA. Therefore, for our spillover treatment variable we consider the share of taxpayers that receive a redesigned notice who live in the same physical geographic block (this is a very similar strategy to Chetty and Saez (2013)). As such, we estimate the following intensity model on the sample of individuals who had no debts:

$$Y_{vjt} = \beta_1 Frac_{NewCDAs} + K_j \gamma_1 + I_{ij} \gamma_2 + T_{ij} \gamma_3 + \varepsilon_{it} \quad (5)$$

The outcome variables in period t of property i located in block j are: (i) a dichotomous variable ($1(Y^v)$) that takes a value one if the taxpayer paid a bill while the tax amnesty was open; (ii) a dichotomous variable that takes a value one if the taxpayer paid a bill on time; (iii) a dichotomous variable that takes a value one if the taxpayer paid a bill within a month of its due date; (iv) a dichotomous variable that takes a value one if the taxpayer paid a bill with more than a month of delay, and; (v) a dichotomous variable that takes a value one if the taxpayer did not pay a bill. The treatment $Frac_{NewCDAs}$ is the sum of the share of participants who received treatments D_1 , D_2 and D_3 in the block j .¹² As we discussed, the randomization among eligible taxpayers was done at the property and not the block level. Hence, taxpayers living in blocks with more participants in the experiment are more likely to be influenced by their neighbors. So, we include in all specifications the fraction of households eligible to participate in the experiment in block j and the total number of taxpayers in each block j as controls in the vector of block-level characteristics K_j . After controlling for these characteristics of the block, the concentration of either treatment per block must be exogenous due to the randomization of the treatment assignment. I_{ij} is a vector of time-invariant property characteristics, and T_{ijt} a vector of tax bill characteristics. ε_{it} is the idiosyncratic error term. Standard errors in all models are clustered at the block level. The coefficient of interest, β_1 measures the spillover effects on the propensity to pay taxes of non-participant households (people who had no debts at the moment of the amnesty). The model assumes that the spillover occurs because taxpayers communicate with each other, which has become standard in the literature following Drago et al. (2015) (see also Carrillo et al. (2017)).

Results are reported in Table 16. There seems to be a clear pattern. Having more people

¹² We cannot identify the effect of all participants together including those who received the Old CDA because of perfect collinearity with the controls at the block level.

in the block that receive the new CDA increases the probability that a formerly paying taxpayer would miss a payment by almost 6pp, and that payments will be made with more than a month of delay by more than 3pp. Most of this effect is explained by a reduction of about the same magnitude in the number of payments that are made on time (2pp) and the payments that were made with a one month delay (almost 7pp). Consequently, having more detailed information about the existence of an amnesty and its benefits in the geographic block seems to encourage non-payment behavior on previously compliant taxpayers. It is important to notice, again, that this result should be taken as a lower bound of the potential negative effects of the amnesty because: (i) the amnesty is widely publicized by the city government in the media; (ii) the effect is the marginal effect over the share who received the old CDA. As such, we are not measuring the overall effect of the amnesty but the marginal effect of more salient and detailed information. Still, the amount collected from the formerly compliant taxpayers would drop by about 3% if 10% of the people in the block receives the new notices (see last row in Table 16).

6 Conclusions

Individuals' attention is limited. When choosing the type and brand of milk we buy, and how much to buy given the posted price, we all use a few cues (reputation, price, etc) to inform our decision. Nevertheless, we rarely estimate the impact on our health of choosing 1% or 2% milk fat, whether there is any correlation between the price of a specific brand and its quality, and what is the final price after taxes we are going to pay. This is not exclusive to supermarket choices. It also happens when buying a house or a car, or when deciding to pay taxes. Gathering more information usually helps to make a better decision, but that process is not cost-less. Moreover, costs are even higher when people need to gather and process the information they receive. As such, cognitive limitations affect decisions too. Those who send signals, be that firms or the government, can choose to either provide relevant information to ease the decision making process or to make decisions even harder. Tax policy is an area in which government usually manipulate information in order to increase the amount of declared and paid taxes. For example, while governments tend to widely publicize the categories of income that should be declared, they are not as forthcoming in informing taxpayers about all the deductions available or the fact that audits tend to be rarer than people estimate.

In this paper, we evaluate the effect of providing relevant and salient information to taxpayers in the context of a tax amnesty that took place in the City of Santa Fe in Argentina. In the experiment, all taxpayers receive the same factual information about the benefits of joining the tax amnesty. However, our results suggest that the way in which government

communicates the amnesty has a significant effect. Providing clearer and salient information to delinquent taxpayers increases the amount of debt they cancel. It increases the amount paid during the amnesty between 6% and 8% compared to individuals who receive a standard communication. Our results suggest that an increment in the collection of due taxes is possible without making substantial investments, but simply by reducing the taxpayers' cognitive costs of processing information.

In the paper, we can also estimate the effect of tax amnesties on current tax compliance by exploiting the improved communication devices. While there are reasons to believe that tax amnesties could have a detrimental effect on tax morale and tax compliance, the empirical evidence is still scant. Our results show that the tax amnesty could have direct negative effects on those taxpayers who participated in the amnesty, and those who used to be compliant. The negative spillover effect on the compliant population could be particularly detrimental for long term compliance in the city. We find that an increase in the share of people who receives the new notices in a geographic block reduces contemporaneous tax compliance substantially. For example, an increase in 20% of the share of people in a block that receives the new notices would decrease compliance by more than 1pp and it would reduce the amount collected by the government by almost 6%. A very simple back of the envelope cost-benefit calculation seems to indicate that the tax amnesty (or better said, providing more clear and salient information about the tax amnesty) was not a good investment for the government. The increase in the collection of debt from people in the treatment group during the tax amnesty seems to be more than compensated by the decrease in current payments because of the spillover on the previously compliant taxpayers.

The paper has clear policy implications. Making public policy more salient, easier to understand, and less cognitive intensive can facilitate individuals' decision-making. However, doing it during a tax amnesty may increase collection of past debt, but it could also generate negative incentives for tax compliance in the overall population.

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Table 2:
Tax debt distribution in May 2017

Debt size	Freq.	Percent	Cum.
[0, 600)	7,963	14.93	14.93
[600, 3600)	21,291	39.92	54.86
[3600, 5400)	11,930	22.37	77.23
[5400, .)	12,140	22.76	100.00
Total	53,324	100.00	

Table 3:
Summary Statistics - Monthly Tax amount in May 2017

Debt size	N	mean	p10	p25	p50	p75	p90
[0, 600)	7,963	118.9	60	60	84.8	139.9	221.4
[600, 3600)	21,291	154.9	60	60	105.5	191.8	340.2
[3600, 5400)	11,930	124.2	60	60	81.6	133.5	240.0
[5400, .)	12,140	611.0	94.9	130.5	241.0	360	666.0
Total	53,324	246.5	60	61.4	115.9	214.6	360.0

Notes: Table shows the average and distribution of monthly tax amount in May 2017.

Table 4: Random assignment to treatment
Intervention 1

	Difference w.r.t. control (coeff and s.e.)			
Average and s.d. Full Sample	Average and s.e. Control	New CDA - Judicial	Sample size	
[1]	[2]	[3]	[4]	
Property valuation (in AR\$)	202,215 (4,323,516)	233,696 (65,856.2)	-63,107 (68,299)	16,097
Lot area (in m^2)	3,387.4 (190,673)	3,109.3 (1519.1)	557.7 (3,012)	16,097
Building area (in m^2)	64.692 (518.894)	59.67 (1.633)	10.06 (8.197)	16,097
Public services coefficient	0.677 (0.114)	0.678 (0.00127)	-0.000553 (0.00180)	16,097
Average tax compliance rate before the amnesty (in %)	.127 (0.229)	0.128 (0.00257)	-0.00198 (0.263)	16,097
Monthly tax amount in May 2017 (in AR\$)	176.2 (1,335.198)	176.1 (15.320)	0.166 (8.340)	16,097

Notes: Each row shows statistics for a different variable. Column [1] shows the intervention 2 (Treatment D_3 and its Control) full sample average and the standard deviation in parenthesis. Columns [2]-[3] show the regression coefficient and the standard error to an OLS regression that includes controls for strata. Standard errors are robust. *** p<0.01, **p<0.05, *p<0.1. Column [4] shows the sample size.

Table 5: Random assignment to treatment
Intervention 2

	Difference w.r.t. control (coeff and s.e.)						
	Average and s.d. Full Sample	Average and s.e. Control	Individual Treatments		p-value	Wald test	Sample size
			New CDA	New CDA with interests [4]			
	[1]	[2]	[3]	[4]	[5]	[6]	
Property valuation (in AR\$)	284,652 (5,121,803)	260,511 (7833.2)	-746.5 (10,477)	72,960 (80,847)	0.266	37,340	
Lot area (in m^2)	1,764.267 (100725.6)	1,947.4 (1003.4)	-963.1 (1,034)	423.7 (1,577)	0.288	37,340	
Building area (in m^2)	97.3 (208.1)	99.1 (2.789)	-1.760 (3.058)	-3.758 (3.044)	0.457	37,340	
Public services coefficient	0.721 (0.131)	0.732 (0.0011)	-0.0018 (0.0015)	-0.0024 (0.0015)	0.722	37,340	
Average tax compliance rate before the amnesty (in %)	45.3 (37.5)	46.7 (0.263)	0.160 (0.206)	0.793 (0.205)	0.693	37,340	
Monthly tax amount in May 2017 (in AR\$)	276.7 (6184.9)	235.8 (8.340)	-11.56 (15.94)	93.80 (95.45)	0.179	37,340	

Notes: Each row shows statistics for a different variable. Column [1] shows the intervention 1 (Treatments D_1 , D_2 and their control group) full sample average and the standard deviation in parenthesis. Columns [2] to [4] show the regression coefficient and the standard error to an OLS regression that includes controls for strata. Standard errors are robust. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Column [5] shows the p-value of a test of equality of coefficients. Column [6] shows the sample size.

Table 6: ITT Results
Intervention 1

Outcome variables	Model Specification		
	[1]	[2]	[3]
Y^a : amount paid (in logs)	0.080*** (0.025)	0.079*** (0.024)	0.081*** (0.024)
Y^b : 1(selects any plan)	1.008*** (0.316)	0.989*** (0.310)	1.014*** (0.310)
Y^c : 1(selects single installment plan)	0.856*** (0.278)	0.849*** (0.274)	0.869*** (0.273)
Y^d : 1(selects any other plan)	0.153 (0.158)	0.140 (0.157)	0.145 (0.157)
Covariates:			
Strata	Y	Y	Y
Characteristics of tax bill	N	Y	Y
Characteristics of property	N	N	Y
Number of observations:	16,097	16,097	16,097

Notes: Table 6 displays the estimate of OLS regression models when outcome $Y^v : (v = a, b, c, d)$ of property i is regressed on the treatment assignment D_1 : *New CDA - Judicial enforcement threat* and a set of covariates. The set of characteristics of the bill are the total amount and age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 7: ITT Results
Intervention 2

Outcome variable: Y^a : amount paid (in logs)	Model Specification					
	[1]	[2]	[3]	[4]	[5]	[6]
D_1 : New CDA	0.053*	0.049*	0.048			
	(0.030)	(0.030)	(0.030)			
D_2 : New CDA with interests discounts	0.061**	0.059**	0.058**	0.007	0.010	0.010
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
C : Old CDA (control group)			-0.053*	-0.049*	-0.048	
			(0.030)	(0.030)	(0.030)	
Y^b : 1(selects any plan)						
D_1 : New CDA	0.635*	0.616*	0.608*			
	(0.359)	(0.359)	(0.358)			
D_2 : New CDA with interests discounts	0.575	0.572	0.574	-0.060	-0.044	-0.034
	(0.359)	(0.358)	(0.358)	(0.360)	(0.359)	(0.359)
C : Old CDA (control group)			-0.635*	-0.616*	-0.608*	
			(0.359)	(0.359)	(0.358)	
Y^c : 1(selects single installment plan)						
D_1 : New CDA	0.615*	0.579*	0.574*			
	(0.340)	(0.339)	(0.339)			
D_2 : New CDA with interests discounts	0.653*	0.631*	0.634*	0.038	0.052	0.060
	(0.340)	(0.339)	(0.339)	(0.340)	(0.339)	(0.339)
C : Old CDA (control group)			-0.615*	-0.579*	-0.574*	
			(0.340)	(0.339)	(0.339)	
Y^d : 1(selects any other plan)						
D_1 : New CDA	0.012	0.030	0.026			
	(0.129)	(0.128)	(0.128)			
D_2 : New CDA with interests discounts	-0.093	-0.074	-0.076	-0.105	-0.104	-0.102
	(0.129)	(0.128)	(0.128)	(0.129)	(0.129)	(0.129)
C : Old CDA (control group)			-0.012	-0.030	-0.026	
			(0.129)	(0.128)	(0.128)	
Covariates:						
Strata	Y	Y	Y	Y	Y	Y
Characteristics of tax bill	N	Y	Y	N	Y	Y
Characteristics of property	N	N	Y	N	N	Y
Number of observations:	37,349	37,340	37,340	37,349	37,340	37,340

Notes: Table 7 displays the estimate of OLS regression models when outcome Y^v : ($v = a, b, c, d$) of property i is regressed on the treatment assignment D_2 , D_3 or C and a set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 8: ITT heterogeneous results - total debt
Intervention 1

Outcome variable: Y^a : amount paid (in logs)	Model Specification		
	[1]	[2]	[3]
D_3 : New CDA - Judicial enforcement threat	-0.041 (0.159)	-0.039 (0.157)	-0.043 (0.156)
H : Total debt (In logs)	0.126*** (0.014)	0.371*** (0.022)	0.316*** (0.024)
$D_3 \times H$	0.016 (0.020)	0.015 (0.020)	0.016 (0.020)
Y^c : 1(selects single installment plan)			
D_3 : New CDA - Judicial enforcement threat	0.384 (1.800)	0.417 (1.780)	0.379 (1.778)
H : Total debt (In logs)	1.215*** (0.163)	3.544*** (0.249)	2.964*** (0.270)
$D_3 \times H$	0.063 (0.231)	0.056 (0.228)	0.064 (0.228)
Y^d : 1(selects any other plan)			
D_3 : New CDA - Judicial enforcement threat	-0.122 (1.025)	-0.119 (1.023)	-0.125 (1.023)
H : Total debt (In logs)	0.818*** (0.093)	1.435*** (0.143)	1.212*** (0.155)
$D_3 \times H$	0.037 (0.131)	0.034 (0.131)	0.035 (0.131)
Covariates:			
Strata	Y	Y	Y
Characteristics of tax bill	N	Y	Y
Characteristics of property	N	N	Y
Number of observations:	16,097	16,097	16,097

Notes: Table 8 displays the estimate of OLS regression models when outcome Y^v : ($v = a, c, d$) of property i is regressed on the treatment assignment D_1 , and its interaction with the set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 9: ITT heterogeneous results - number of unpaid bills
Intervention 1

Outcome variable: Y^a : amount paid (in logs)	Model Specification		
	[1]	[2]	[3]
D_3 : New CDA - Judicial enforcement threat	0.116*** (0.041)	0.111*** (0.040)	0.110*** (0.040)
J : Number of unpaid bills	0.001 (0.001)	-0.046*** (0.004)	-0.043*** (0.004)
$D_3 \times J$	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Y^b : 1(selects single installment plan)			
D_3 : New CDA - Judicial enforcement threat	1.443*** (0.465)	1.417*** (0.458)	1.396*** (0.458)
J : Number of unpaid bills	0.010 (0.007)	-0.552*** (0.048)	-0.515*** (0.048)
$D_3 \times J$	-0.016 (0.010)	-0.015 (0.010)	-0.014 (0.010)
Y^c : 1(selects any other plan)			
D_3 : New CDA - Judicial enforcement threat	0.176 (0.265)	0.136 (0.263)	0.127 (0.263)
J : Number of unpaid bills	0.019*** (0.004)	0.044 (0.027)	0.056** (0.028)
$D_3 \times J$	-0.000 (0.006)	0.000 (0.006)	0.000 (0.006)
Covariates:			
Strata	Y	Y	Y
Characteristics of tax bill	N	Y	Y
Characteristics of property	N	N	Y
Number of observations:	16,097	16,097	16,097

Notes: Table 9 displays the estimate of OLS regression models when outcome Y^v : ($v = a, c, d$) of property i is regressed on the treatment assignment D_1 , and a set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 10: ITT heterogeneous results - fiscal assessment
Intervention 1

Outcome variable: Y^a : amount paid (in logs)	Model Specification		
	[1]	[2]	[3]
D_3 : New CDA - Judicial enforcement threat	-0.120 (0.122)	-0.093 (0.120)	-0.082 (0.120)
I : Fiscal Assessment (in logs)	0.057*** (0.008)	0.021** (0.008)	0.016* (0.009)
$D_3 \times I$	0.019* (0.011)	0.016 (0.011)	0.015 (0.011)
Y^c : 1(selects single installment plan)			
D_3 : New CDA - Judicial enforcement threat	-1.165 (1.383)	-0.909 (1.367)	-0.795 (1.366)
I : Fiscal Assessment (in logs)	0.610*** (0.089)	0.261*** (0.092)	0.216** (0.097)
$D_3 \times I$	0.187 (0.127)	0.165 (0.126)	0.156 (0.126)
Y^d : 1(selects any other plan)			
D_3 : New CDA - Judicial enforcement threat	0.045 (0.791)	0.158 (0.786)	0.202 (0.786)
I : Fiscal Assessment (in logs)	0.190*** (0.051)	0.099* (0.053)	0.114** (0.056)
$D_3 \times I$	0.009 (0.073)	-0.002 (0.072)	-0.005 (0.072)
Covariates:			
Strata	Y	Y	Y
Characteristics of tax bill	N	Y	Y
Characteristics of property	N	N	Y
Number of observations:	16,097	16,097	16,097

Notes: Table 10 displays the estimate of OLS regression models when outcome Y^v : ($v = a, c, d$) of property i is regressed on the treatment assignment D_3 , and its interaction with the set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 11: ITT heterogeneous results - total debt
Intervention 2

Outcome variable: Y^a : amount paid (in logs)	Model Specification		
	[1]	[2]	[3]
D_1 : New CDA	0.150 (0.201)	0.176 (0.200)	0.176 (0.200)
D_2 : New CDA with interests discounts	0.444** (0.202)	0.457** (0.200)	0.459** (0.200)
H : Total debt (In logs)	-0.119*** (0.019)	0.007 (0.023)	0.010 (0.026)
$D_1 \times H$	-0.013 (0.025)	-0.016 (0.025)	-0.016 (0.025)
$D_2 \times H$	-0.049* (0.025)	-0.051** (0.025)	-0.051** (0.025)
Y^c : 1(selects single installment plan)			
D_1 : New CDA	3.513 (2.289)	3.670 (2.283)	3.782* (2.283)
D_2 : New CDA with interests discounts	5.868** (2.295)	5.945*** (2.289)	6.036*** (2.288)
H : Total debt (In logs)	-1.006*** (0.221)	-0.252 (0.267)	-0.604** (0.292)
$D_1 \times H$	-0.374 (0.289)	-0.396 (0.288)	-0.409 (0.288)
$D_2 \times H$	-0.670** (0.290)	-0.679** (0.289)	-0.690** (0.289)
Y^d : 1(selects any other plan)			
D_1 : New CDA	0.172 (0.866)	0.206 (0.866)	0.236 (0.866)
D_2 : New CDA with interests discounts	0.090 (0.868)	0.113 (0.868)	0.114 (0.868)
H : Total debt (In logs)	0.767*** (0.084)	0.656*** (0.101)	0.515*** (0.111)
$D_1 \times H$	-0.018 (0.109)	-0.023 (0.109)	-0.027 (0.109)
$D_2 \times H$	-0.021 (0.110)	-0.024 (0.110)	-0.024 (0.110)
Covariates:			
Strata	Y	Y	Y
Characteristics of tax bill	N	Y	Y
Characteristics of property	N	N	Y
Number of observations:	37,349	37,340	37,340

Notes: Table 11 displays the estimate of OLS regression models when outcome Y^v : ($v = a, c, d$) of property i is regressed on the treatment assignment D_1 , D_2 , and a set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 12: ITT heterogeneous results - number of unpaid bills
Intervention 2

Outcome variable: Y^a : amount paid (in logs)	Model Specification		
	[1]	[2]	[3]
D_1 : New CDA	0.123** (0.052)	0.123** (0.052)	0.123** (0.052)
D_2 : New CDA with interests discounts	0.188*** (0.052)	0.189*** (0.052)	0.190*** (0.052)
J : Number of unpaid bills	-0.018*** (0.002)	-0.055*** (0.004)	-0.055*** (0.004)
$D_1 \times J$	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)
$D_2 \times J$	-0.006*** (0.002)	-0.006*** (0.002)	-0.006*** (0.002)
Y^c : 1(selects single installment plan)			
D_1 : New CDA	1.367** (0.591)	1.354** (0.590)	1.376** (0.590)
D_2 : New CDA with interests discounts	1.996*** (0.591)	2.004*** (0.590)	2.036*** (0.590)
J : Number of unpaid bills	-0.119*** (0.018)	-0.448*** (0.050)	-0.423*** (0.051)
$D_1 \times J$	-0.039 (0.024)	-0.039 (0.024)	-0.040* (0.024)
$D_2 \times J$	-0.067*** (0.024)	-0.068*** (0.024)	-0.069*** (0.024)
Y^d : 1(selects any other plan)			
D_1 : New CDA	0.184 (0.224)	0.205 (0.224)	0.209 (0.224)
D_2 : New CDA with interests discounts	-0.182 (0.224)	-0.171 (0.224)	-0.169 (0.224)
J : Number of unpaid bills	0.029*** (0.007)	0.019 (0.019)	0.032* (0.019)
$D_1 \times J$	-0.008 (0.009)	-0.009 (0.009)	-0.009 (0.009)
$D_2 \times J$	0.005 (0.009)	0.005 (0.009)	0.005 (0.009)
Covariates:			
Strata	Y	Y	Y
Characteristics of tax bill	N	Y	Y
Characteristics of property	N	N	Y
Number of observations:	37,349	37,340	37,340

Notes: Table 12 displays the estimate of OLS regression models when outcome $Y^v : (v = a, c, d)$ of property i is regressed on the treatment assignment D_2 , D_3 , and a set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 13: ITT heterogeneous results - fiscal assessment
Intervention 2

Outcome variable: Y^a : amount paid (in logs)	Model Specification		
	[1]	[2]	[3]
D_1 : New CDA	-0.177 (0.226)	-0.182 (0.224)	-0.183 (0.224)
D_2 : New CDA with interests discounts	-0.203 (0.224)	-0.207 (0.222)	-0.208 (0.222)
I : Fiscal Assessment (in logs)	0.052*** (0.013)	0.033** (0.014)	0.031** (0.015)
$D_1 \times I$	0.020 (0.019)	0.020 (0.019)	0.020 (0.019)
$D_2 \times I$	0.023 (0.019)	0.023 (0.019)	0.023 (0.019)
Y^c : 1(selects single installment plan)			
D_1 : New CDA	-1.694 (2.569)	-1.826 (2.561)	-1.752 (2.560)
D_2 : New CDA with interests discounts	-4.024 (2.546)	-4.174 (2.538)	-4.214* (2.538)
I : Fiscal Assessment (in logs)	0.268* (0.153)	0.261 (0.163)	0.093 (0.167)
$D_1 \times I$	0.198 (0.219)	0.205 (0.218)	0.200 (0.218)
$D_2 \times I$	0.402* (0.217)	0.412* (0.216)	0.417* (0.216)
Y^d : 1(selects any other plan)			
D_1 : New CDA	0.703 (0.973)	0.853 (0.971)	0.886 (0.971)
D_2 : New CDA with interests discounts	-0.021 (0.964)	0.096 (0.963)	0.088 (0.963)
I : Fiscal Assessment (in logs)	0.321*** (0.058)	0.180*** (0.062)	0.162** (0.063)
$D_1 \times I$	-0.060 (0.083)	-0.071 (0.083)	-0.074 (0.083)
$D_2 \times I$	-0.006 (0.082)	-0.015 (0.082)	-0.014 (0.082)
Covariates:			
Strata	Y	Y	Y
Characteristics of tax bill	N	Y	Y
Characteristics of property	N	N	Y
Number of observations:	37,349	37,340	37,340

Notes: Table 13 displays the estimate of OLS regression models when outcome Y^v : ($v = a, c, d$) of property i is regressed on the treatment assignment D_2 , D_3 , and a set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 14: Effects on Current Bills Compliance
Intervention 1

	D_3 : New CDA - Judicial threat [1]
Y^e : $\text{l}(\text{payment when amnesty open})$	-0.000 (0.001)
Y^f : $\text{l}(\text{Payment on time})$	0.001 (0.001)
Y^g : $\text{l}(\text{Payment within a month delay})$	-0.004*** (0.001)
Y^h : $\text{l}(\text{Payment with more of a month delay})$	0.001** (0.001)
Y^i : $\text{l}(\text{Payment hasn't been made})$	0.003** (0.001)
Covariates:	
Characteristics of tax bill	Y
Characteristics of property	Y
Number of observations:	191,292

Notes: Table 15 displays the estimate of OLS regression models when outcome Y^v ($v = e, f, g, h, i$) of property i is regressed on the treatment assignment D_1 and a set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors clustered at the property level are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 15: Effects on Current Bills Compliance
Intervention 2

	Model Specification	
	[1]	[2]
Y^e : 1(payment when amnesty open)		
D_1 : New CDA	0.000 (0.001)	
D_2 : New CDA with interests discounts	-0.001 (0.001)	-0.001 (0.001)
C : Old CDA (control group)		-0.000 (0.001)
Y^f : 1(Payment on time)		
D_1 : New CDA	0.000 (0.001)	
D_2 : New CDA with interests discounts	-0.001 (0.001)	-0.001 (0.001)
C : Old CDA (control group)		-0.000 (0.001)
Y^g : 1(Payment within a month delay)		
D_1 : New CDA	0.002 (0.001)	
D_2 : New CDA with interests discounts	-0.004*** (0.001)	-0.006*** (0.001)
C : Old CDA (control group)		-0.002 (0.001)
Y^h : 1(Payment with more of a month delay)		
D_1 : New CDA	0.000 (0.001)	
D_2 : New CDA with interests discounts	0.000 (0.001)	0.000 (0.001)
C : Old CDA (control group)		0.000 (0.001)
Y^i : 1(Payment hasn't been made)		
D_1 : New CDA	-0.002 (0.002)	
D_2 : New CDA with interests discounts	0.005** (0.002)	0.006*** (0.002)
C : Old CDA (control group)		0.002 (0.002)
Covariates:		
Characteristics of tax bill	Y	Y
Characteristics of property	Y	Y
Number of observations:	312,841	312,841

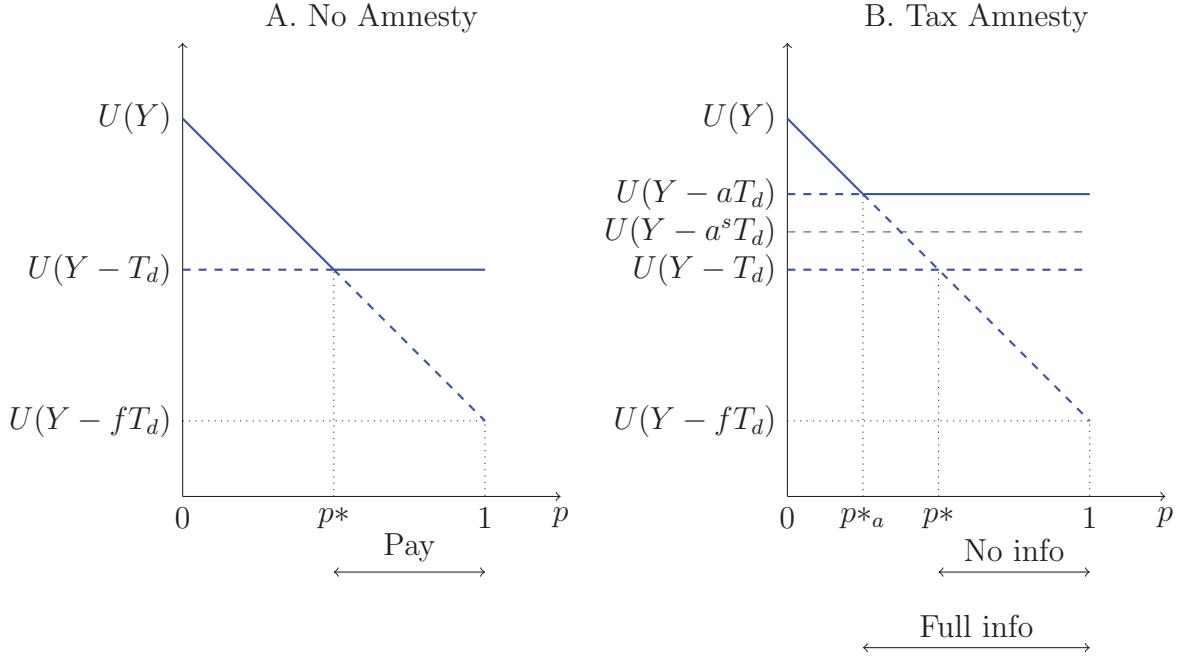
Notes: Table 14 displays the estimate of OLS regression models when outcome Y^v ($v = e, f, g, h, i$) of property i is regressed on the treatment assignment D_2 , D_3 or C and a set of covariates. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Each column in the table corresponds to a different specification. Standard errors clustered at the property level are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Table 16: Spillover Effects

f_t : participants D_1, D_2, D_3 /properties in $block_j$	[1]
Y^e : l(payment when amnesty open)	0.010 (0.012)
Y^f : l(Payment on time)	-0.023 (0.034)
Y^g : l(Payment within a month delay)	-0.068** (0.027)
Y^h : l(Payment with more of a month delay)	0.035*** (0.012)
Y^i : l(Payment haven't been made)	0.056** (0.022)
Y^j : Payment amount	-0.276** (0.113)
Covariates:	
Characteristics of block	Y
Characteristics of tax bill	Y
Characteristics of property	Y
Number of observations:	1,070,233

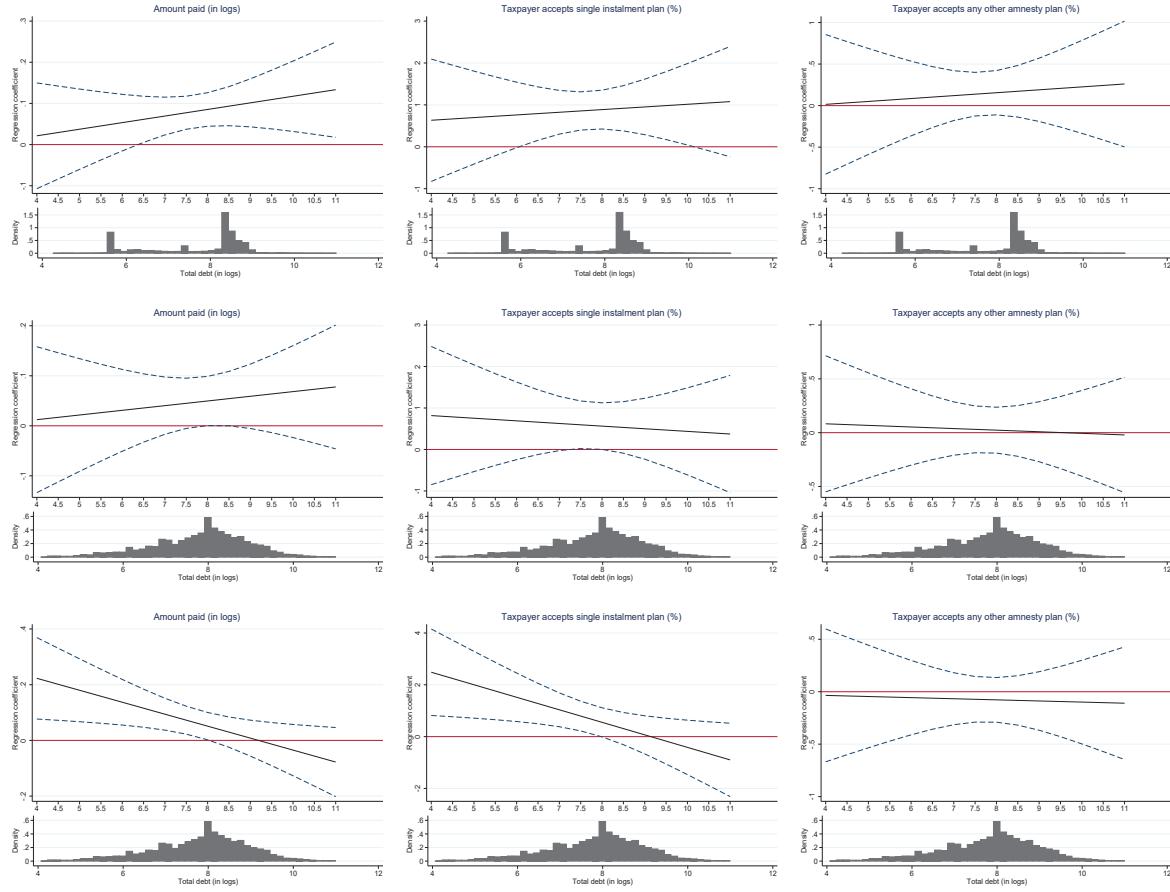
Notes: Table 16 displays the estimate of OLS regression models when outcome $Y^v : (v = e, f, g, h, i)$ of property i is regressed on the proportion of the experiment participants per block $\{f_t\}$ (the proportion of treatments D_1 , D_2 and D_3), and a set of covariates. The set of characteristics of the block are the total proportion of participants in the experiment ($\{f_t\} + frac_C$) and the total number of taxpayers in the block. The set of characteristics of the tax bill are the total amount and average age of the outstanding debt with the tax authority. The set of characteristics of the property includes the size of the building, the property's fiscal valuation, and the public service index. Sample includes all non-participant properties, those with less than three unpaid bills by May 2017. Each column in the table corresponds to a different specification. Standard errors clustered at the block level are reported in parenthesis. *, **, and *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Figure 1:
Taxpayer Compliance Problem



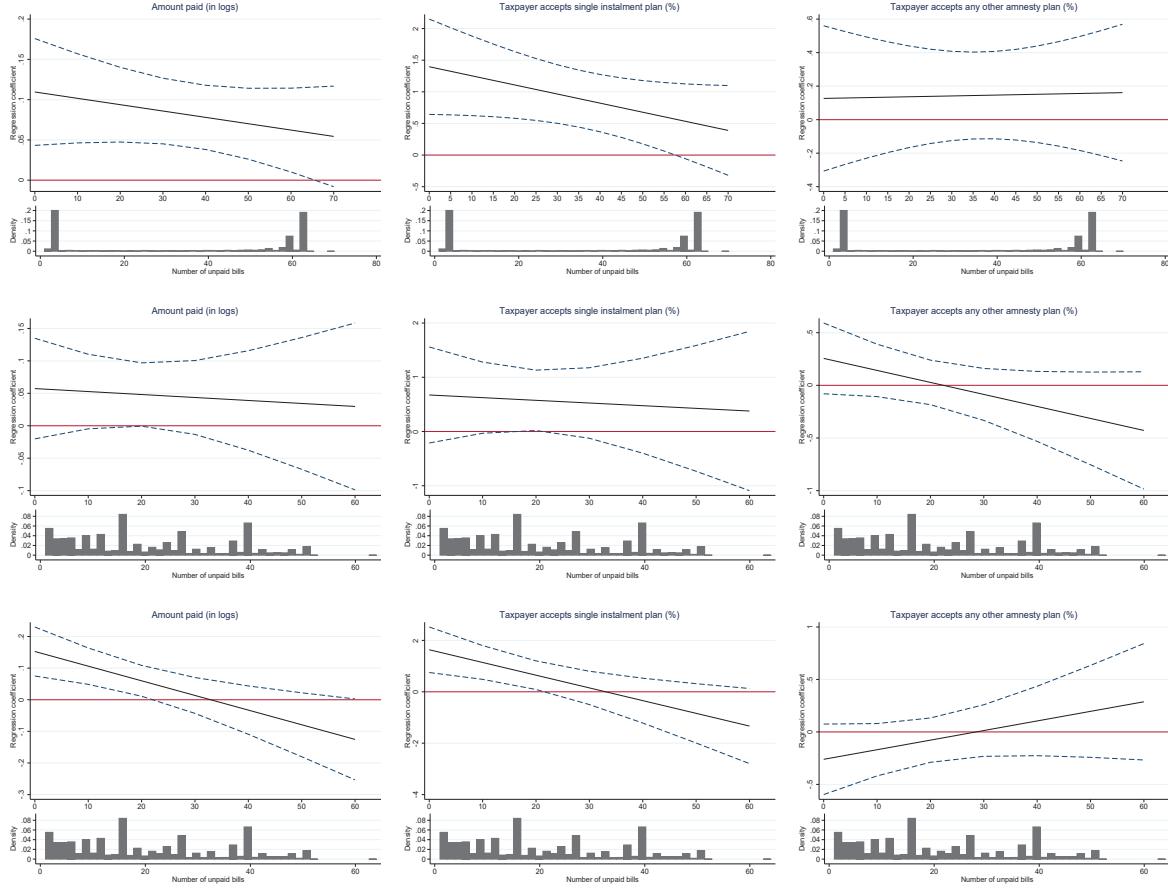
Notes: The left graph illustrates the taxpayer problem described in Equation 1. The right graph illustrates the taxpayer problem described in Equation 2. In the case of no amnesty, consumers compare $U(Y - T_d)$ with a weighted average of $U(Y)$ and $U(Y - fT_d)$. The solid line denotes the optimal choice: it is optimal for all taxpayers with $p > p^*$ to pay the tax and *vice versa*. The right panel illustrates the effect of the amnesty and the reduction in the cost of paying what the taxpayer owes by a . Since $aT_d < T$, $U(Y - aT_d) > U(Y - T_d)$, and the number of people that would pay what they owe increases: $[1 - F(p^*_a)] > [1 - F(p^*)]$. With limited attention, taxpayers make their decision according to a^s , which is an estimate of a .

Figure 2: Heterogeneous Effects - Total unpaid liability



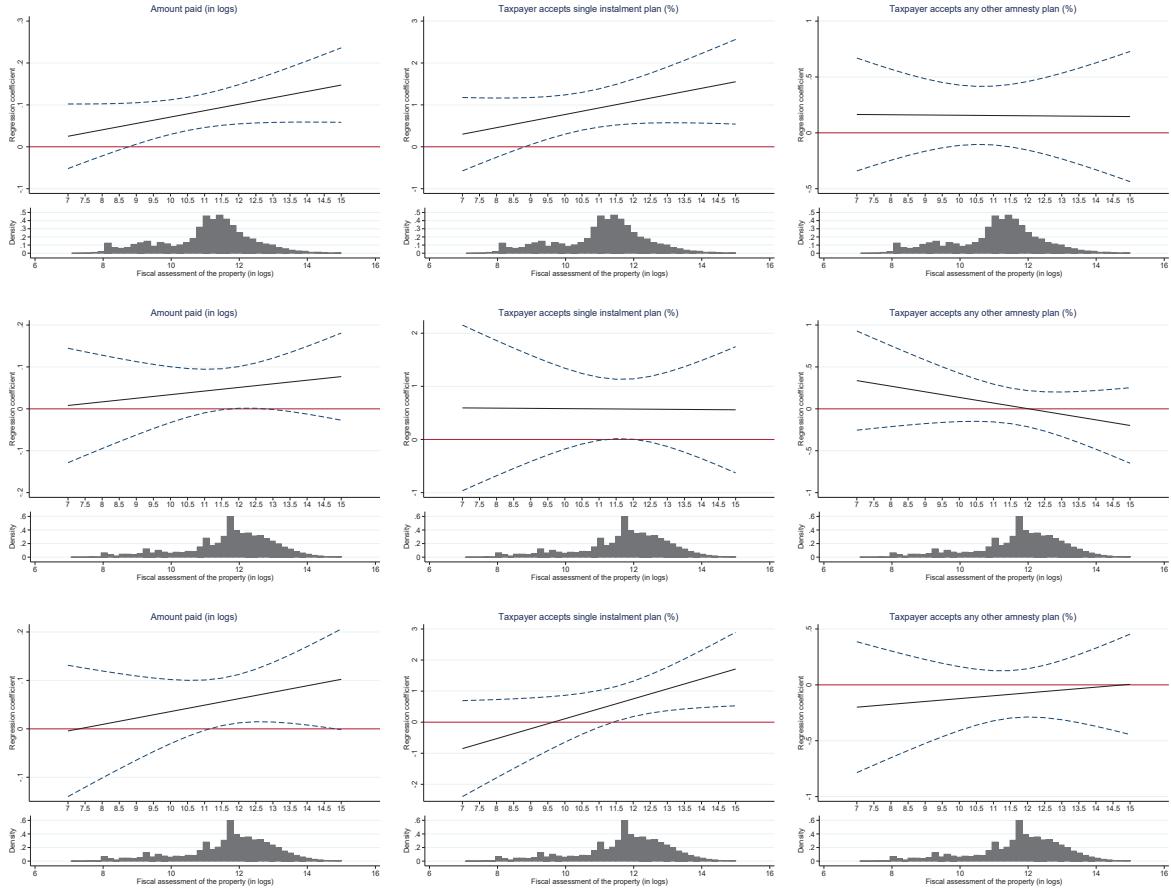
Notes: Figure 2 shows the estimated effect of the interactions between treatments and the total unpaid liability. Columns indicate the outcomes: amount paid, joined single installment plan, and joined any other amnesty plan; while the rows correspond to each of the treatments with a new CDA: the first row, to treatment D_1 ; the second, to treatment D_2 ; and the third, to treatment D_3 , respectively. In each of the individual graphs, the solid black line corresponds to the regression line while the dashed lines indicate the 90% confidence intervals. The red line indicates the zero value.

Figure 3: Heterogeneous Effects - Number of unpaid bills



Notes: Figure 3 shows the estimated effect of the interactions between treatments and the number of unpaid bills. Columns indicate the outcomes: amount paid, joined single installment plan, and joined any other amnesty plan; while the rows correspond to each of the treatments with a new CDA: the first row, to treatment D_1 ; the second, to treatment D_2 ; and the third, to treatment D_3 , respectively. In each of the individual graphs, the solid black line corresponds to the regression line while the dashed lines indicate the 90% confidence intervals. The red line indicates the zero value.

Figure 4: Heterogeneous Effects - Fiscal Assessment



Notes: Figure 4 shows the estimated effect of the interactions between treatments and the fiscal assessment of the property. Columns indicate the outcomes: amount paid, joined single installment plan, and joined any other amnesty plan; while the rows correspond to each of the treatments with a new CDA: the first row to treatment D_1 ; the second, to treatment D_2 ; and the third, to treatment D_3 , respectively. In each of the individual graphs, the solid black line corresponds to the regression line while the dashed lines indicate the 90% confidence intervals. The red line indicates the zero value.

Figure 5:
Old CDA - Control Example

CONTRIBUYENTE		CANCELACIÓN DE DEUDA ATRASADA																						
 MUNICIPALIDAD DE LA CIUDAD DE SANTA FE DE LA VERA CRUZ www.santafeciudad.gov.ar																								
<p>(No incluye deudas en gestión judicial, ni convenios de pago, ni moratorias) www.santafeciudad.gov.ar</p>																								
CONTRIBUYENTE 		PADRÓN N° 	LIQUIDACIÓN N° 																					
SAN FRANCISCO 2400		BOLETA N° 63																						
<p>Conforme a nuestros registros su cuenta posee un saldo deudor al 31/03/2015 de \$ 11366,63 Hasta el 21/08/2015, tendrán vigencia los siguientes beneficios:</p>																								
<p>Total a Cancelar por Pago Contado \$ 7178,67</p> <p>Pago en cuotas: Interés por financiación del 2% mensual Plan A: Hasta 6 cuotas mensuales, iguales y consecutivas, reducción interés por mora del 3% al 1%. Plan B: Anticipo del 10% plazo máximo en 12 cuotas mensuales, iguales y consecutivas, reducción interés por mora del 3% al 1%. Plan C: Hasta 18 cuotas mensuales, iguales y consecutivas, reducción del interés por mora del 3% al 2%. Plan D: Anticipo del 10% plazo máximo en 24 cuotas mensuales, iguales y consecutivas, reducción interés por mora del 3% al 2%.</p> <p>La presente liquidación es válida para la cancelación por pago contado. Podrá realizar planes de pago ingresando a: http://www.santafeciudad.gov.ar/servicios/contribuyentes/tasa_general_inmuebles.html o concurriendo al Centro de Distrito más cercano a su domicilio.</p> <p>También podrá abonar con tarjeta de crédito Mastercard y Visa del Banco Santa Fe y Credifair hasta 6 cuotas sin interés en las cajas ubicadas en el Palacio Municipal.</p> <p>De no regularizar la deuda, su cuenta será asignada a gestión judicial para iniciar las acciones necesarias para el cobro.</p> <p>De haber efectuado pagos por los períodos detallados, deberá acreditar los correspondientes comprobantes durante los meses de julio y agosto de 2015. Los reclamos podrán hacerse vía web o en ventanilla de contribuyentes del Palacio Municipal.</p> <p>Evite mayores inconvenientes regularizando su situación a la brevedad. Atentamente,</p> <p style="text-align: right;">Dirección de Rentas</p>																								
MAYOR INFORMACIÓN: Palacio Municipal Ventanilla de Contribuyente de 7.30 a 14.00 hs.		LOTE: 1102																						
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Figure 6:
First Intervention Treatment Example

 MUNICIPALIDAD DE LA CIUDAD DE SANTA FE DE LA VERA CRUZ www.santafeciudad.gov.ar		CANCELACIÓN DE DEUDA ATRASADA		TGI																																						
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Pago CONTADO		Vencimiento xx/xx/xxxx	Importe \$XXX.XXX,XX																																							
																																										

Figure 7:
Second Intervention Treatment 1 Example

 MUNICIPALIDAD DE LA CIUDAD DE SANTA FE DE LA VERA CRUZ www.santafeciudad.gov.ar	CANCELACIÓN DE DEUDA ATRASADA		TGI																																																																																													
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Figure 8:
Second Intervention Treatment 2 Example

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