Online appendix for

Using Divide-and-Conquer to Improve Tax Collection

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Abstract

Online Appendix OA reports additional reduced form findings. Online Appendix OB describes the in-sample fit of our structural model and performs robustness checks. Online Appendix OC investigates additional counterfactuals. Online Appendix OD extends the theoretical analysis to environments where taxes due are private information. Online Appendixe OE reports findings from laboratory experiments testing various divide-and-conquer mechanisms. Online Appendix OF provides precise organizational details for the experiment.

OA Reduced-form findings

OA.1 Impact of priorities and actions on repayments

In this section, we reestimate the regression reported in column 2 of Table 5 of the main text, including all balance variables as controls. The key observation is that coefficients of interest are nearly unchanged.

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	Payment Next Week
	Estimate (s.e.)
G1	0.019 (0.002)
G2	0.000 (0.002)
G3	-0.005 (0.001)
Writ	0.016 (0.001)
Garnishment	0.007 (0.003)
G1 & Writ	-0.004 (0.004)
G1 & Garnishment	-0.011 (0.005)
Est. Repayment Prob (Endo. covariates)	0.013 (0.006)
Some Repayment	0.043 (0.002)
Share Repaid	-0.024 (0.000)
Prev. Year Share Repaid at 3M	0.032 (0.003)
Constant	0.011 (0.002)
Additional Covariates	Yes
N	295504

Table OA.1: OLS Regression of Payment Events on Priorities, Actions and Covariates

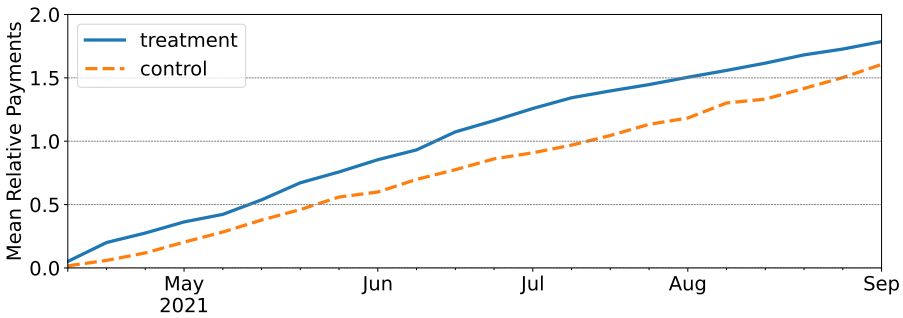
Notes. Robust standard errors in parentheses. *Additional covariates* are remaining variables in Table D.1.

OA.2 Relative payment by assignment

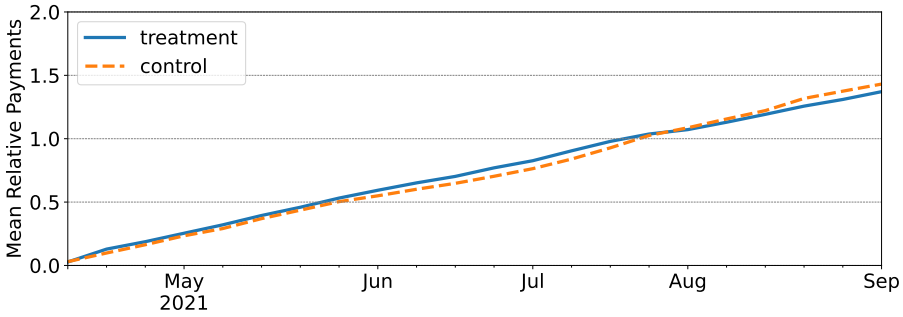
In this subsection, we present additional figures that clarify the effect of being assigned to treatment and, more specifically, to priority group G1.

Figure OA.1 reports the mean of relative payments $\Pi_{i,t}$ over time, for taxpayers with total taxes due above and below 1000 Soles. The graphs confirm that treatment increases repayment rates, but only on tax payers with a total taxes due high enough to be assigned priority G1.

In the initial group assigned to priority G1, we included 200 taxpayers drawn at random from the treatment group. To measure the effect of G1 on a typical taxpayer, we can compare the evolution of repayment over time for those initially assigned to G1 to the evolution of repayment over time to a comparable control group. Figure OA.2 does this by randomly



(a) Mean relative payments, Taxes Due $\geq$ 1000.



(b) Mean relative payments, Taxes Due $<$ 1000.

Figure OA.1: Mean relative payment

Note: Panel (a) plots the ratio of payment (in Peruvian S/.) to taxes due (in Peruvian S/.) for taxpayers with taxes due above 1000 Peruvian S/., and includes both voluntary payments by taxpayers and collection through garnishment. Panel (b) plots the same ratio, but for taxpayers with taxes due below 1000 Peruvian S/.

selecting a sample of size 200 from the control to match the distribution across quintiles of the ranking score (based on endogenous covariates) of the 200 randomly selected taxpayers in the initial G1 group.

OA.3 Voluntary Payments

In the main text, we analyze behavior using *all* payments, including both voluntary payments and payments from garnishment. Here, we reproduce key findings from Section 5 using voluntary payments alone. In Figure OA.3, we plot cumulative tax voluntarily collected over the sample period. The treatment group voluntarily paid 6.4% higher tax than the control

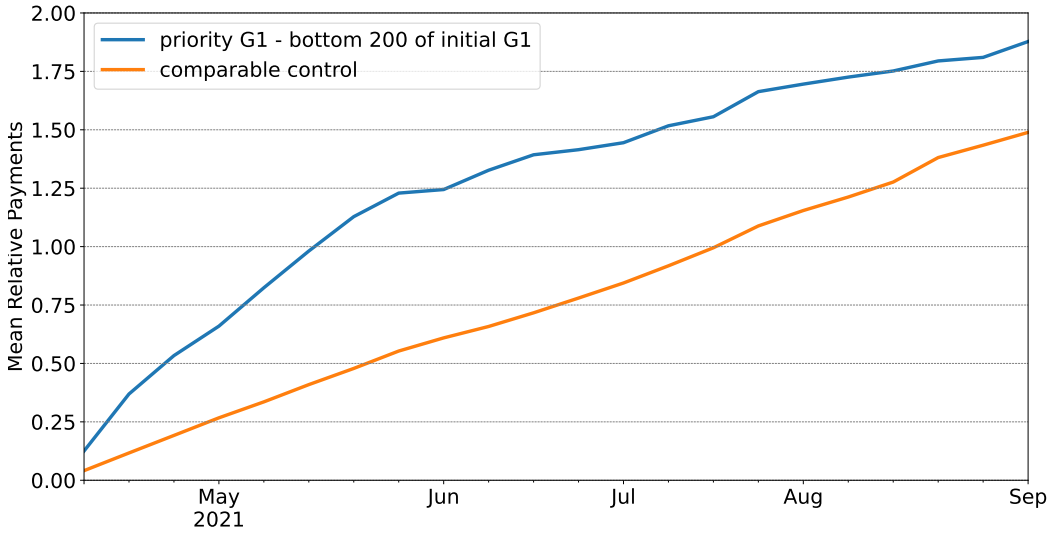


Figure OA.2: Mean relative payment for randomly selected 200 initial G1 v.s. comparable control

Note: To generate comparable control, we compute the quintiles of the score based on endogenous covariates for the randomly selected 200 taxpayers in the initial G1 group. We then draw the same number of taxpayers between consecutive quintiles of score from the control group.

group. In Figure OA.4, we plot the share of tax revenue collected as a function of quantile of taxes due. As in Figure 8 of the main text, treatment collects more taxes from those with greater taxes due, i.e., treatment is progressive. Finally, Figure OA.5 plots the repayment rates of tax-payers in the initial G1 group against a comparable control (matched based on endogenous repayment probability). As in Figure 9 of the main text, tax-payers with priority $G1$ pay (voluntarily) at a faster rate than those in control. This difference tapers more quickly for voluntary payments towards the end of the sample period than for total payments. Nevertheless, the key result that tax-payers with priority G1 pay more quickly than comparable tax-payers in control—which quickly frees up capacity for the authority to recycle—remains quantitatively similar. For instance, through the second week of May, the difference in payment rates between those in priority G1 and those in the comparable control group is approximately 20 percentage points for both voluntary and total payments.

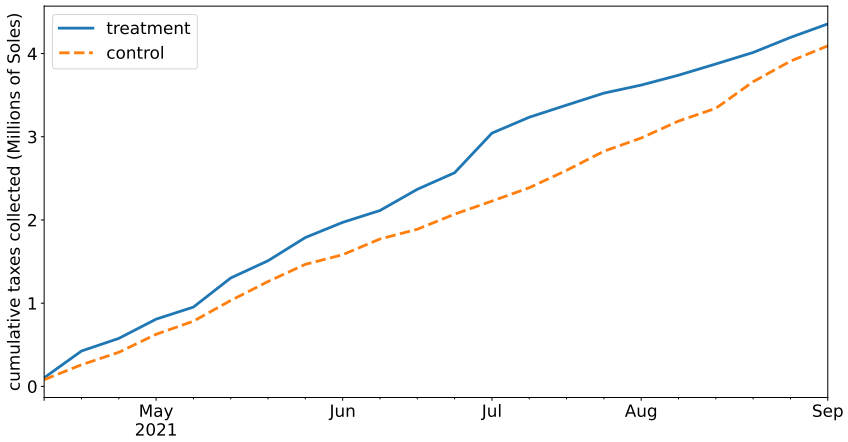


Figure OA.3: Cumulative taxes collected April - September 2021, voluntary payments.

Note: Cumulative taxes collected through voluntary payment by taxpayers (in millions of Peruvian S/.).

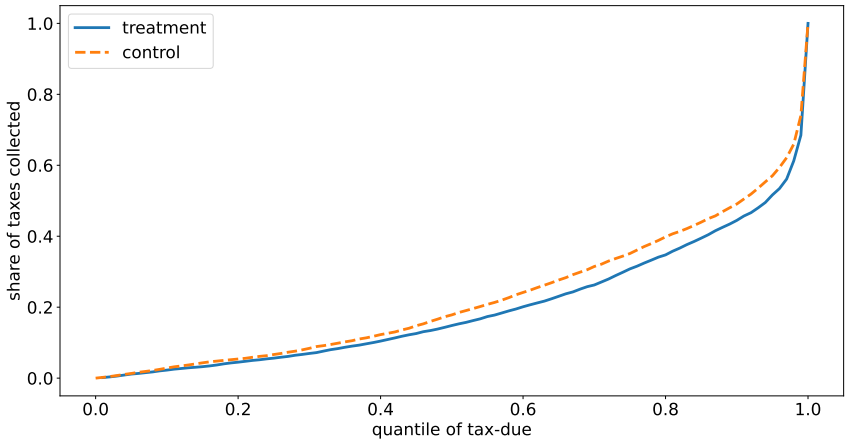


Figure OA.4: Share of total tax revenue collected as a function of quantile of taxes due, voluntary payments.

Note: To compute the share of taxes collected from taxpayers through voluntary payment at quantile q of taxes due, we divide taxes paid voluntarily by taxpayers below the q^{th} quantile of taxes due, with taxes paid voluntarily by all taxpayers.

In Table OA.2, we report MCMC estimates using only voluntary payments data. Estimates are approximately the same as in Table 7 of the main text.

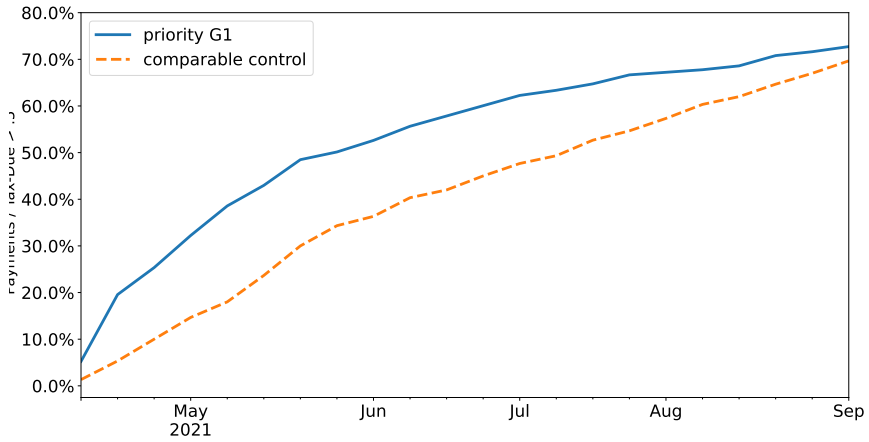


Figure OA.5: Repayment G1 vs Control

Note: The solid and dashed lines represent the share of taxpayers who have voluntarily paid at least 50% of their tax due for the treatment and control groups.

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$2.90 \cdot 10^{-2}$	$(0.28 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-3.50 \cdot 10^{-2}$	$(0.13 \cdot 10^{-2})$
β_{G1}	$3.54 \cdot 10^{-2}$	$(0.32 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$-4.00 \cdot 10^{-2}$	$(0.67 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$-1.16 \cdot 10^{-2}$	$(0.59 \cdot 10^{-2})$
β_{G2}	$0.42 \cdot 10^{-2}$	$(0.29 \cdot 10^{-2})$
β_{G3}	$-0.66 \cdot 10^{-2}$	$(0.14 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$1.83 \cdot 10^{-2}$	$(0.48 \cdot 10^{-2})$
β_{writ}	$3.19 \cdot 10^{-2}$	$(0.24 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$0.02 \cdot 10^{-2}$	$(0.01 \cdot 10^{-2})$
β_{ξ}	$1.26 \cdot 10^{-1}$	$(0.41 \cdot 10^{-2})$
$\underline{\varphi}$	$1.13 \cdot 10^{-2}$	$(0.20 \cdot 10^{-2})$
$\overline{\varphi}$	$3.43 \cdot 10^{-1}$	$(0.91 \cdot 10^{-1})$
σ	$4.87 \cdot 10^{-2}$	$(0.24 \cdot 10^{-2})$

Table OA.2: Estimating the settlement behavior of taxpayers for voluntary payments.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, but using voluntary payments only.

OA.4 Spillover Effects

This section examines a possible failure of SUTVA through spillover effects: treated taxpayers may affect the repayment behavior of control taxpayers through conversations and information sharing. It is important to assess whether such a spillover effect increases or decreases repayments from control taxpayers (for instance, if control taxpayers infer that they have a lower priority than their treated neighbors): in the former case, our analysis underestimates the impact of treatment on collection; in the latter case, our analysis overestimates the impact of treatment on collection.

We offer two pieces of evidence to inform this question. First, we report results from a 2014 survey showing that discussions of taxes across neighbors are rare, even following salient communication with tax authorities. Second, we attempt to replicate the analysis of Drago et al. (2020) which identifies positive spillovers across taxpayers in a letter-based enforcement experiment studying the payment of TV license fees in Austria. Our data is imperfect, and estimates very noisy, but if anything they also point to positive spillovers.

Survey evidence on the odds of information exchange. Informational spillovers between treatment and control taxpayers only happen if neighbors exchange information about taxes. Information flows from treated to control taxpayers occur if and only if: (i) the control taxpayer speaks with a neighbor about taxes, and (ii) the neighbor belongs to the treatment group.

A survey conducted in the context of Del Carpio (2014), a letter based experiment informing taxpayers of the frequency with which other taxpayers repaid their taxes, informs on the frequency of tax conversations. The survey included the following question.

> [English] Have you recently discussed with other people in the district about property tax payment or compliance? Yes/No
>
> [Spanish] Recientemente ha discutido con otras personas del distrito acerca del

pago o cumplimiento del impuesto predial? Si/No

Survey respondents included 2,381 residents of Jesus Maria (the sample was stratified by neighborhood). Responses were: No (2,109 or 89%), Yes (272 or 11%). Note that the survey was implemented after the intervention took place (i.e., the first time residents in the treatment groups received a letter from the municipality), so that taxes were likely salient.

Even if a control taxpayer exchanges information with a neighbor, the odds that the neighbor is included in the treatment group are relatively low. Overall, treatment included 6704 taxpayers, out of roughly 35000 taxpayers. Only 1838 taxpayers ever received a priority G1 assignment.

Altogether, although there may be selection on who taxpayers discuss taxes with, information exchanges between control and treatment taxpayers are likely infrequent, limiting the channels through which spillover effects can occur.

Measuring spillovers. We have partial data on taxpayers' residence block. This allows us to replicate in spirit the analysis of Drago et al. (2020), a letter-based tax-enforcement experiment studying the impact of treated close-by neighbors on the repayment behavior of control taxpayers. In our context, we define two taxpayers as close if their properties are in the same block. There are two main limits to our replication efforts:

- Block data is only available for taxpayers that were delinquent in a previous year. This restricts our sample to $8,570$ taxpayers forming a selected group (see Table OA.3). Although treatment and control are balanced within this group (see Table OA.4), spillover effects may be different for this subpopulation.

- Because of the urban setting we work in, blocks are large: the median number of properties in a block is 142. As a result, our definition of close-by neighbors – taxpayers in the same block – will typically include between 100 and 200 taxpayers. In contrast, Drago et al. (2020) study rural and suburban residents and have access to precise

location information. Under their baseline proximity measure, a taxpayer has a median of 6 close-by neighbors. This means that we only observe a noisy proxy of taxpayers' effective network, biasing estimates towards zero.

	Mean Full Sample	Mean Sub-sample	p-value
Endogenous score (s_i)	550.08	397.79	0.00
Annual Total Tax Due	1196.35	1403.39	0.00
Treatment Rate	0.4991	0.4951	0.56
Ever in G1	0.1401	0.1116	0.00
Observations	13,432	8,570	

Table OA.3: The sub-sample of taxpayers for whom we have block data differs from our experimental sample.

	Mean Treatment	Mean Control	p-value
Endogenous score (s_i)	404.04	391.67	0.81
Annual Total Tax Due	1378.20	1428.10	0.53
Observations	4,243	4,327	

Table OA.4: Treatment assignment remains balanced in the sub-sample of taxpayers for which block data is available.

With these caveats, we implement our analysis of spillovers as follows. We focus on blocks that cover at least one control and one treatment taxpayer in our estimation sample: a total of 218 blocks, out of 243 in the whole district. Table OA.5 reports descriptive statistics at the block level. Block size N_k corresponds to the number of properties in the block. Its median is 142 and its mean is 227. For each block k, we compute measures of treatment coverage: $Total_k$ denotes the share of other taxpayers in the same block included in the experimental sample (e.g., those that were delinquent in Q1 2021).[1] $Treatment_k$ and $Control_k$ indicate the share of other taxpayers in the treatment and control groups.

[1]We do not observe the total number of taxpayers living in each block and use the number of properties

	Mean	SD	Median	25^{th} Quantile	75^{th} Quantile
Block Size (N_k)	226.88	268.63	142.00	63.00	273.00
$Total_k$	0.22	0.13	0.21	0.14	0.27
$Treatment_k$	0.11	0.07	0.10	0.07	0.13
$Control_k$	0.11	0.07	0.10	0.07	0.13
Observations	218				

Table OA.5: Descriptive statistics of block characteristics.

We estimate spillover effects from treatment using the following models:

$$y_{ik} = \alpha Treatment_k + \delta_{Decile\,Total_k} + \epsilon_{ik} \tag{O1}$$

$$y_{ik} = \alpha Treatment_k + \beta Treatment_i + \gamma Ever\_G1_i + \delta_{Decile\,Total_k} + \epsilon_{ik}. \tag{O2}$$

Variable y_{ik} measures total payments from taxpayer i in block k, $Treatment_i$ denotes taxpayer i's assignment to treatment, and $Ever\_G1_i$ indicates whether the taxpayer was ever assigned a G1 priority. Following Drago et al. (2020), both specifications include fixed-effects for each decile of $Total_k$ to capture the fact that blocks with a higher share of delinquent taxpayers are systematically different from blocks with a lower share of delinquent taxpayers. Equation (O1) is estimated on control taxpayers alone, while equation (O2) is estimated on both control and treatment taxpayers.

Table OA.6 reports estimation results. The parameter of interest is the coefficient α on $Treatment_k$, the share of taxpayers treated in the block. In both specifications estimated spillover effects are positive but noisily estimated. Large standard errors make the estimates difficult to interpret, but if anything, their sign matches the evidence for positive spillovers in Drago et al. (2020).

as a proxy.

	(O1) Control Only Total Tax Paid	(O2) Treatment and Control Total Tax Paid
Ever in G1		1,480.40***
		(285.81)
Treatment		-274.50***
		(54.74)
$Treatment_k$	3,359.20	1,225.69
	(2,585.30)	(1,677.09)
Constant	184.47	405.54**
	(263.83)	(170.51)
Observations	4,321	8,559
R-squared	0.004	0.016
$Total_k$ Decile FE	Yes	Yes
Blocks	218	218

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Note: Ever G1 and Treatment are dummies taking value 1 for taxpayers ever assigned a priority G1 and assigned to treatment, respectively. $Treatment_k$ is the block level share of other taxpayers in the experimental sample. Column (O1) includes control observations only, and Column (O2) includes control and treatment observations. Both include $Total_k$ decile fixed effects.

Table OA.6: Spillover estimates are noisy and positive.

OB Model Fit and Robustness

OB.1 In Sample Fit

Figure OB.1 plots collection, actions, and priorities in the actual treatment data, and in the simulated treatment *(as implemented)* (CF1 in Table 8 of the main text). Figure OB.2 plots collection and actions in the actual control data and in our *control* simulation. In both cases, simulated outcomes appear to match actual outcomes fairly closely.

Table OB.1, compares the number of binary payment events under simulated treatment (as implemented) and control to the data. Again simulated outcomes are fairly close to actual outcomes.

Finally, Table OB.2 reports actual and simulated average payments per event, both for the entire sample and taxpayers below the 99^{th} percentile of tax due. In both cases our model appears to underestimate payment amounts under treatment, making our treatment effect estimates conservative. We discuss alternative specifications of payment amounts conditional on payment events in Section OB.4.

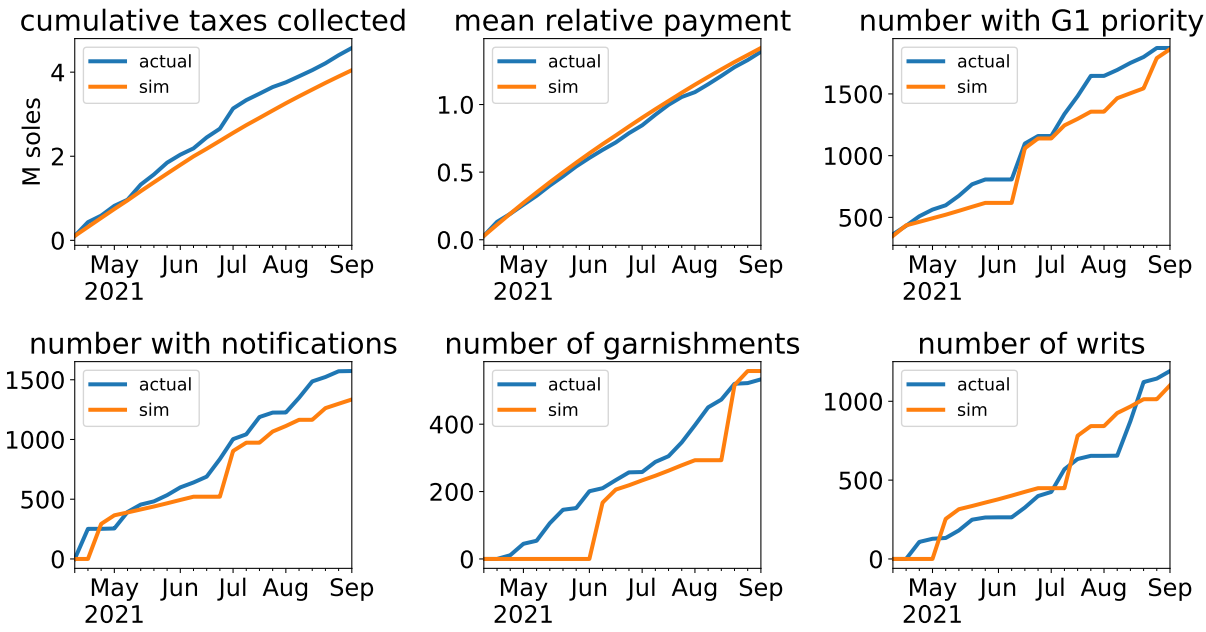


Figure OB.1: Simulated v.s. actual treatment actions, priorities, collection.

Note: *sim* indicates statistics simulated using counterfactual CF1 (experiment as implemented) from main text Table 8 using our semi-structural model; *actual* indicates statistics from the actual data.

OB.2 Findings using Q1 taxes only

The main text of the paper considers all tax payments made by taxpayers delinquent on their Q1 taxes, whether the payments correspond to Q1, or Q2-Q4 taxes.

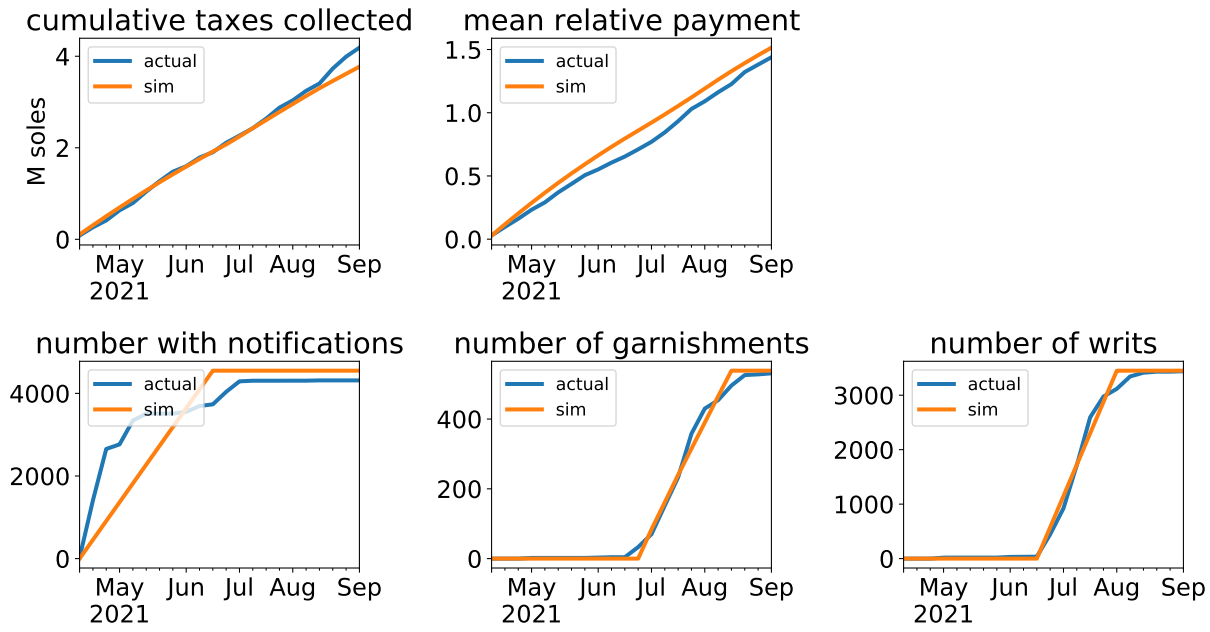


Figure OB.2: Simulated v.s. actual control actions and collection

Note: *sim* indicates statistics simulated using counterfactual CF1 (experiment as implemented) from main text Table 8 using our semi-structural model; *actual* indicates statistics from the actual data.

	# Payment events	
	Actual Data	Simulations
Treatment	4928	5100
Control	5279	5345

Table OB.1: Simulated v.s. actual binary payment events.

Note: The first column, *Actual data*, reports the number of times a payment was made in treatment and control, respectively. The second column, *Simulations*, reports the same but for simulated data from our semi-structural model (using CF1 from main text Table 8).

Our findings are similar if we focus on payments relating to Q1 taxes alone, though parameter estimates from the model are mechanically smaller since there are less payment events within the same time horizon. We report both tax collection by experimental group, and parameter estimates for the model of Section 6.

	Average payment per event (in Peruvian S/.)			
	All taxpayers		$\leq 99^{th}$ percentile tax due	
	Actual Data	Simulation	Actual Data	Simulation
Treatment	928	792	652	632
Control	793	706	597	594

Table OB.2: Simulated v.s. actual average payment per event.

Note: The first two columns correspond to data from all taxpayers, while the last two columns correspond to data from taxpayers below the 99th percentile of tax due.

Cumulative 2021 tax collection of Q1 debt by experimental group during the five months following the first-quarter 2021 tax deadline is shown in Figure OB.3. The pattern is very similar to total tax collection for unrestricted payments presented in Figure 7.

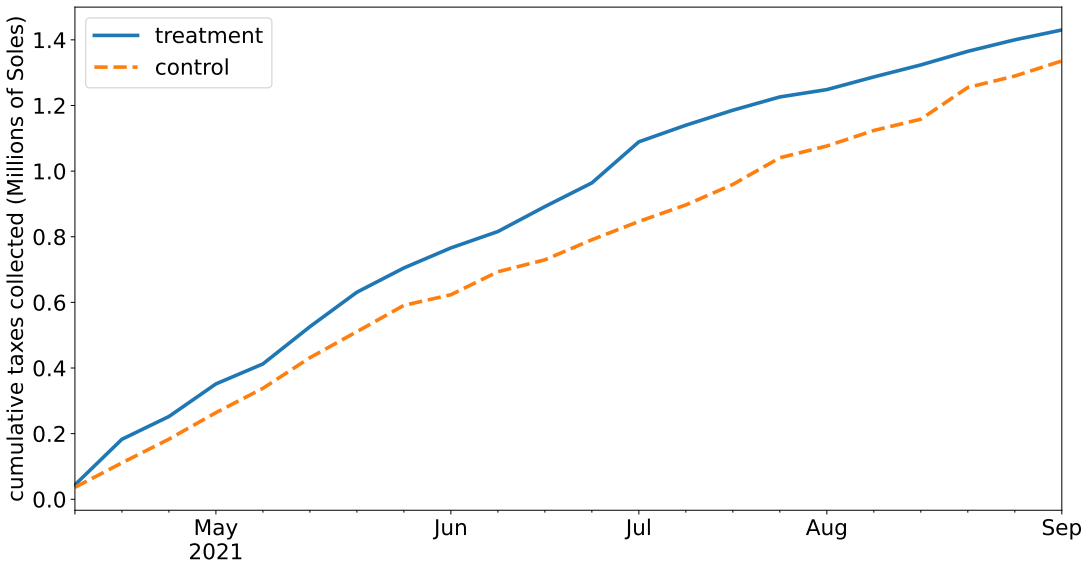


Figure OB.3: Cumulative Tax Collected April - September 2021, Q1 Debt Only

Note: Cumulative taxes collected for Q1 debt by taxpayers (in millions of Peruvian S/.).

Table OB.3 reports posterior means and standard deviations for parameters of interest in the estimation restricted to payments of Q1 debt only. Estimates are qualitatively similar to those for unrestricted payments reported in Table 7, though settlement intensities are

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$2.70 \cdot 10^{-2}$	$(0.21 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-9.96 \cdot 10^{-2}$	$(0.04 \cdot 10^{-2})$
β_{G1}	$1.41 \cdot 10^{-2}$	$(0.22 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$-1.03 \cdot 10^{-2}$	$(0.48 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$-0.53 \cdot 10^{-2}$	$(0.38 \cdot 10^{-2})$
β_{G2}	$-0.09 \cdot 10^{-2}$	$(0.20 \cdot 10^{-2})$
β_{G3}	$-0.32 \cdot 10^{-2}$	$(0.08 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$0.97 \cdot 10^{-2}$	$(0.30 \cdot 10^{-2})$
β_{writ}	$1.59 \cdot 10^{-2}$	$(0.16 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$0.01 \cdot 10^{-2}$	$(0.01 \cdot 10^{-2})$
β_{ξ}	$8.63 \cdot 10^{-2}$	$(0.23 \cdot 10^{-2})$
$\underline{\varphi}$	$-0.13 \cdot 10^{-2}$	$(0.09 \cdot 10^{-2})$
$\overline{\varphi}$	$3.09 \cdot 10^{-1}$	$(1.13 \cdot 10^{-1})$
σ	$1.58 \cdot 10^{-2}$	$(0.17 \cdot 10^{-2})$

Table OB.3: Estimating the settlement behavior of taxpayers for Q1 debt.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, but using Q1 debt and payments only.

mechanically smaller. The coefficient on $G1$ is smaller by a factor of roughly two and a half, while the coefficient on writs is smaller by a factor of roughly two.

OB.3 Alternative Functional Forms

Time trend. In Table OB.4, we report posterior means and standard deviations from an estimation in which we allow for a linear time trend equal to the number of weeks elapsed since the beginning of the experiment, while still imposing the lower bound of 0 on the coefficient on notifications. Estimates are similar to those reported in Table 7.

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$-1.46 \cdot 10^{-2}$	$(0.43 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-6.06 \cdot 10^{-2}$	$(0.36 \cdot 10^{-2})$
β_{G1}	$4.78 \cdot 10^{-2}$	$(0.51 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$-1.02 \cdot 10^{-2}$	$(0.98 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$-0.35 \cdot 10^{-2}$	$(0.74 \cdot 10^{-2})$
β_{G2}	$-0.04 \cdot 10^{-2}$	$(0.46 \cdot 10^{-2})$
β_{G3}	$-1.38 \cdot 10^{-2}$	$(0.28 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$1.39 \cdot 10^{-2}$	$(0.69 \cdot 10^{-2})$
β_{writ}	$3.61 \cdot 10^{-2}$	$(0.34 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$0.02 \cdot 10^{-2}$	$(0.02 \cdot 10^{-2})$
β_{ξ}	$2.44 \cdot 10^{-1}$	$(1.13 \cdot 10^{-2})$
β_{time}	$0.44 \cdot 10^{-2}$	$(0.03 \cdot 10^{-2})$
$\underline{\varphi}$	$1.09 \cdot 10^{-1}$	$(0.89 \cdot 10^{-2})$
$\overline{\varphi}$	$3.79 \cdot 10^{-1}$	$(7.43 \cdot 10^{-2})$
σ	$1.15 \cdot 10^{-1}$	$(0.58 \cdot 10^{-2})$

Table OB.4: Estimating the settlement behavior of taxpayers allowing for linear time trend.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, with an additional variable, *time*, equal to the number of weeks elapsed since the beginning of the experiment.

Explicit control for repayment in past years and age. In Table OB.5 we re-estimate our model including previous year repayment share as a covariate, as well as age. We find qualitatively the same coefficients as in our baseline specification.

Controlling for time spent on calls with taxpayer. In Table OB.6 we re-estimate our model controlling for the cumulative amount of time spent calling taxpayers. Estimated parameters of interest are similar to those obtained in our main specification.[2]

[2]The distribution of call times has a long right tail, so we also estimate a version in which we truncate call length at 500 seconds. This leads to nearly indistinguishable changes to all coefficients except for $\beta_{\text{cumulative calls (hours)}}$, which increases.

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$2.84 \cdot 10^{-2}$	$(0.31 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-3.68 \cdot 10^{-2}$	$(0.16 \cdot 10^{-2})$
β_{G1}	$4.00 \cdot 10^{-2}$	$(0.34 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$-2.68 \cdot 10^{-2}$	$(0.67 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$-1.26 \cdot 10^{-2}$	$(0.60 \cdot 10^{-2})$
β_{G2}	$0.78 \cdot 10^{-2}$	$(0.30 \cdot 10^{-2})$
β_{G3}	$-0.87 \cdot 10^{-2}$	$(0.15 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$2.79 \cdot 10^{-2}$	$(0.47 \cdot 10^{-2})$
β_{writ}	$3.56 \cdot 10^{-2}$	$(0.25 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$0.02 \cdot 10^{-2}$	$(0.01 \cdot 10^{-2})$
β_{ξ}	$5.66 \cdot 10^{-2}$	$(0.56 \cdot 10^{-2})$
$\beta_{\text{last year share repaid}}$	$5.03 \cdot 10^{-2}$	$(0.35 \cdot 10^{-2})$
$\beta_{\text{quantile age}}$	$-0.37 \cdot 10^{-2}$	$(0.23 \cdot 10^{-2})$
$\underline{\varphi}$	$0.69 \cdot 10^{-2}$	$(0.25 \cdot 10^{-2})$
$\overline{\varphi}$	$3.57 \cdot 10^{-1}$	$(8.83 \cdot 10^{-2})$
σ	$5.28 \cdot 10^{-2}$	$(0.25 \cdot 10^{-2})$

Table OB.5: Estimating the settlement behavior of taxpayers including last year share repaid within 3 months and taxpayer age quantile as covariates.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, with two additional variables: *last year share repaid*, which is the share of taxes due repaid in the previous year within 3 months of the deadline, and *quantile age*, which is the taxpayer's quantile in the age distribution.

Controlling for length of deadline. In Table OB.7, we report results of an estimation in which parameters are allowed to depend on whether or not the deadline for payment in G1 is above or below the median deadline length. Coefficients are broadly similar, though the coefficient on garnishment shrinks, and the coefficients on G1-garnishment and G1-writ become mildly positive. However, these coefficients are estimated more noisily than in the estimation of the main text.

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$2.76 \cdot 10^{-2}$	$(0.29 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-3.54 \cdot 10^{-2}$	$(0.14 \cdot 10^{-2})$
β_{G1}	$3.54 \cdot 10^{-2}$	$(0.33 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$-2.56 \cdot 10^{-2}$	$(0.70 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$-1.27 \cdot 10^{-2}$	$(0.57 \cdot 10^{-2})$
β_{G2}	$0.37 \cdot 10^{-2}$	$(0.30 \cdot 10^{-2})$
β_{G3}	$-0.62 \cdot 10^{-2}$	$(0.15 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$2.12 \cdot 10^{-2}$	$(0.47 \cdot 10^{-2})$
β_{writ}	$3.29 \cdot 10^{-2}$	$(0.24 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$0.02 \cdot 10^{-2}$	$(0.02 \cdot 10^{-2})$
β_{ξ}	$1.32 \cdot 10^{-2}$	$(0.46 \cdot 10^{-2})$
$\beta_{\text{cumulative calls (hours)}}$	$0.11 \cdot 10^{-2}$	$(0.02 \cdot 10^{-2})$
$\underline{\varphi}$	$1.48 \cdot 10^{-2}$	$(0.22 \cdot 10^{-2})$
$\overline{\varphi}$	$3.44 \cdot 10^{-1}$	$(8.97 \cdot 10^{-2})$
σ	$5.18 \cdot 10^{-2}$	$(5.18 \cdot 10^{-2})$

Table OB.6: Estimating the settlement behavior of taxpayers controlling for call hours.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, with the additional variable *cumulative calls (hours)*, which is the number of hours that staff at Jesús María spent on the phone with the taxpayer.

Allowing treatment effect to change over time. We now consider a robustness check in which we allow G1 and writ coefficients to depend on whether we are in the pre June or post June period (alternatively pre or post July). In particular, we interact the priority status G1 indicator, the writ indicator, and the priority status G1 $\times$ writ interaction with a dummy for whether or not the data is after June 6th or before June 6th (respectively after and before July 12th). The results are reported in Table OB.8 below.

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$2.83 \cdot 10^{-2}$	$(0.28 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-3.50 \cdot 10^{-2}$	$(0.13 \cdot 10^{-2})$
β_{G1}	$3.54 \cdot 10^{-2}$	$(0.45 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$1.68 \cdot 10^{-2}$	$(1.64 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$1.13 \cdot 10^{-2}$	$(1.12 \cdot 10^{-2})$
$\beta_{\text{G1-above med. deadline}}$	$0.21 \cdot 10^{-2}$	$(0.61 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment-above med. deadline}}$	$-2.67 \cdot 10^{-2}$	$(0.73 \cdot 10^{-2})$
$\beta_{\text{G1-writ-above med. deadline}}$	$-1.60 \cdot 10^{-2}$	$(0.75 \cdot 10^{-2})$
β_{G2}	$0.45 \cdot 10^{-2}$	$(0.30 \cdot 10^{-2})$
β_{G3}	$-0.64 \cdot 10^{-2}$	$(0.14 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$2.18 \cdot 10^{-2}$	$(0.46 \cdot 10^{-2})$
β_{writ}	$3.29 \cdot 10^{-2}$	$(0.23 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$0.02 \cdot 10^{-2}$	$(0.02 \cdot 10^{-2})$
β_{ξ}	$1.30 \cdot 10^{-1}$	$(0.42 \cdot 10^{-2})$
$\underline{\varphi}$	$1.31 \cdot 10^{-2}$	$(0.20 \cdot 10^{-2})$
$\overline{\varphi}$	$3.46 \cdot 10^{-1}$	$(0.91 \cdot 10^{-1})$
σ	$5.05 \cdot 10^{-2}$	$(0.23 \cdot 10^{-2})$

Table OB.7: Estimating the settlement behavior of taxpayers, including an interaction with an indicator for having a G1 deadline above the median.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, with interactions for having a G1 deadline above the median. The qualifier *above med. deadline* appended to a coefficient subscript indicates an interaction between the variable and an indicator for having a G1 deadline above the median.

Alternative ϕ. In Table OB.9, we report posterior means and standard deviations from an estimation in which ϕ (defined in 6) takes the form of a logistic function:

$$\phi(x) = \frac{\overline{\varphi}}{1 + e^{-(x-\underline{\varphi})}}$$

for $\underline{\varphi} \in \mathbb{R}$ and $\overline{\varphi} \in \mathbb{R}_+$.

Findings remain qualitatively similar: both group G1 assignment and writs have a large

	June cutoff		July cutoff	
	Mean	(std. dev.)	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$2.92 \cdot 10^{-2}$	$(0.28 \cdot 10^{-2})$	$2.91 \cdot 10^{-2}$	$(0.27 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-3.48 \cdot 10^{-2}$	$(0.14 \cdot 10^{-2})$	$-3.49 \cdot 10^{-2}$	$(0.13 \cdot 10^{-2})$
β_{G1}	$4.08 \cdot 10^{-2}$	$(0.59 \cdot 10^{-2})$	$3.65 \cdot 10^{-2}$	$(0.44 \cdot 10^{-2})$
$\beta_{\text{G1-after cutoff date}}$	$0.32 \cdot 10^{-2}$	$(3.48 \cdot 10^{-2})$	$3.04 \cdot 10^{-2}$	$(1.56 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$0.50 \cdot 10^{-2}$	$(3.13 \cdot 10^{-2})$	$2.43 \cdot 10^{-2}$	$(1.07 \cdot 10^{-2})$
$\beta_{\text{G1-writ-after cutoff date}}$	$-0.65 \cdot 10^{-2}$	$(0.64 \cdot 10^{-2})$	$-0.13 \cdot 10^{-2}$	$(0.49 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$-1.55 \cdot 10^{-2}$	$(3.52 \cdot 10^{-2})$	$-4.83 \cdot 10^{-2}$	$(1.66 \cdot 10^{-2})$
β_{G2}	$0.43 \cdot 10^{-2}$	$(0.31 \cdot 10^{-2})$	$0.41 \cdot 10^{-2}$	$(0.31 \cdot 10^{-2})$
β_{G3}	$-0.65 \cdot 10^{-2}$	$(0.14 \cdot 10^{-2})$	$-0.65 \cdot 10^{-2}$	$(0.14 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$0.89 \cdot 10^{-2}$	$(0.47 \cdot 10^{-2})$	$0.92 \cdot 10^{-2}$	$(0.49 \cdot 10^{-2})$
β_{writ}	$2.85 \cdot 10^{-2}$	$(3.13 \cdot 10^{-2})$	$0.97 \cdot 10^{-2}$	$(1.09 \cdot 10^{-2})$
$\beta_{\text{writ-after cutoff date}}$	$-1.23 \cdot 10^{-2}$	$(0.69 \cdot 10^{-2})$	$-1.32 \cdot 10^{-2}$	$(0.69 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$0.01 \cdot 10^{-2}$	$(0.01 \cdot 10^{-2})$	$0.01 \cdot 10^{-2}$	$(0.01 \cdot 10^{-2})$
β_{ξ}	$1.28 \cdot 10^{-1}$	$(0.42 \cdot 10^{-2})$	$1.28 \cdot 10^{-1}$	$(0.43 \cdot 10^{-2})$
$\underline{\varphi}$	$1.22 \cdot 10^{-2}$	$(0.20 \cdot 10^{-2})$	$1.25 \cdot 10^{-2}$	$(0.20 \cdot 10^{-2})$
$\overline{\varphi}$	$3.37 \cdot 10^{-1}$	$(9.08 \cdot 10^{-2})$	$3.45 \cdot 10^{-1}$	$(0.91 \cdot 10^{-1})$
σ	$4.92 \cdot 10^{-2}$	$(0.23 \cdot 10^{-2})$	$4.94 \cdot 10^{-2}$	$(0.24 \cdot 10^{-2})$

Table OB.8: Estimating the settlement behavior of taxpayers allowing for different G1 and writ parameters before and after June and July.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, allowing for different G1 and writ parameters before and after June and July. *June cutoff* indicates that the cutoff variable takes value 1 if the date is after June 6th and 0 otherwise. *July cutoff* indicates that the cutoff variables takes value 1 if the date is after July 12th and 0 otherwise.

impact on settlement intensities.

OB.4 Alternative payment specifications.

Change in number of bins. As described in Section 6, in simulations, we place taxpayers into one of 13 bins based on total due, and draw $\pi_{i,t}$ (taxpayer i's payment at time t, expressed

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	1.21	(0.46)
$\beta_{\Pi_{i,t}}$	-1.07	(0.79)
β_{G1}	1.18	(0.24)
$\beta_{\text{G1-garnishment}}$	-0.53	(0.40)
$\beta_{\text{G1-writ}}$	-0.45	(0.26)
β_{G2}	0.19	(0.23)
β_{G3}	-0.24	(0.06)
$\beta_{\text{garnishment}}$	0.27	(0.34)
β_{writ}	1.12	(0.12)
$\beta_{\text{notification}}$	0.01	(0.01)
β_{ξ}	4.71	(1.50)
$\underline{\varphi}$	3.41	(0.29)
$\overline{\varphi}$	0.20	(0.15)
σ	1.54	(0.28)

Table OB.9: Estimating the settlement behavior of taxpayers using a logistic ϕ.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, but using $\phi(x) = \frac{\overline{\varphi}}{1+e^{-(x-\underline{\varphi})}}$.

as a share of total due) from the empirical distribution of payments associated with that group of taxpayers. We show here that the results of the simulations are robust to the number of bins used. In particular, we rerun our simulations using two alternative bin specifications: one with 4 bins of equal size (i.e., quartiles) and another with 20 bins of equal size.

Using 4 bins, replicating CF2 from Table 8 of the main text (*experiment as intended*) increases tax revenue over control by 3.8%. Using 20 bins, CF2 increases tax revenue over control by 1.8%. The changes in tax revenue with 4 bins are larger than those with 13 bins. This is because taxpayers with large total due—who are most exposed to the positive effects of G1—pay on average a smaller share of what they owe per binary event in the actual data, but using only 4 bins in the simulations mutes this effect. The changes in tax revenue with 20 bins are approximately the same as those in the main text with 13 bins. Estimated effects

for other counterfactuals behave similarly with respect to the number of bins.

Allowing payment to depend on treatment status. In the actual data, there are differences in relative payment rates between treatment and control, even conditional on a payment event. We report these in Table OB.10.

	Relative Payment	
Taxes Due	Treatment	Control
0-1000 Soles	1.95	1.89
1000-5000 Soles	0.94	0.87
5000+ Soles	1.34	0.89

Table OB.10: Average relative payment conditional on a payment event, by treatment status.

Note: The first (second) column reports the the average ratio of payment to taxes due in treatment (control), within each of three sets of taxes due: 0-1000 Soles, 1000-5000 Soles, 5000+ Soles.

We consider a robustness check in which simulations for control use relative payments from control only, and simulations for treatment use relative payments from treatment only. In particular, we recompute CF1 from Table 8 of the main text using relative payments from treatment only (at the mean parameters in Table 7), and compare to the control simulation from Table 8 of the main text using relative payments from control only (at the mean parameters in Table 7). Doing this, we find that CF1 improves by 15% over control.

OB.5 Investigating the impact of notifications

As we discuss in Section 6, our main specification imposes the prior restriction that the coefficient on notifications is weakly positive. This restriction is at least in part challenged by aspects of our data.

Data. In Figure OB.4, we plot the average across control-group taxpayers of the relative payments they make each week, as a fraction of annualized Q1 debt. We split the population

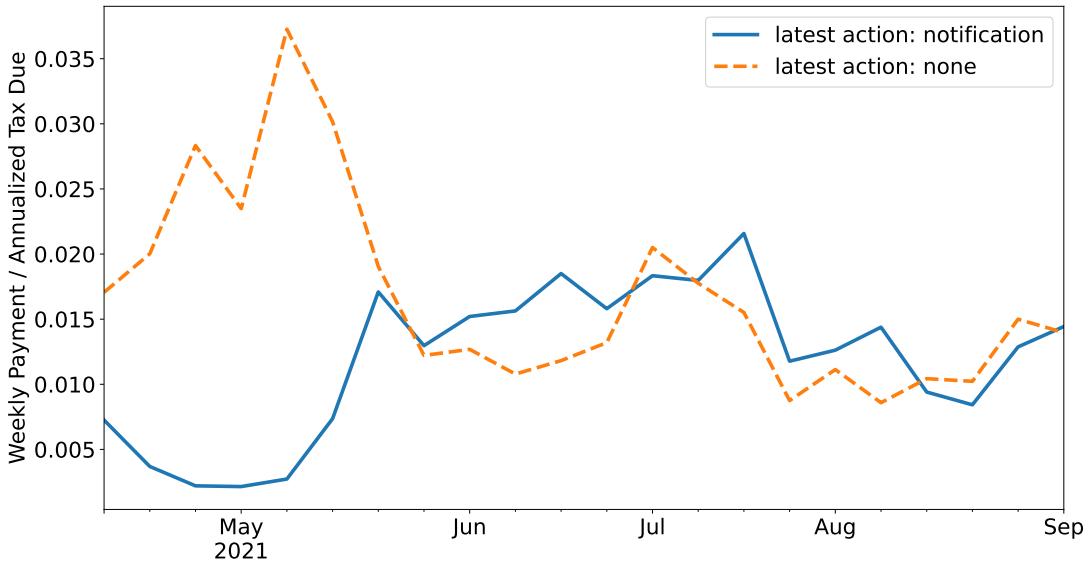


Figure OB.4: Payment given latest action (notification or none), control group.

Note: Each point on the blue (orange) line corresponds to the ratio of payments made in that week to total taxes due, for taxpayers in control whose most recent action is receiving a notification (have not been subject to any action).

in two subgroups: (1) the group of taxpayers for whom the most recent collection-action taken is a notification, and (2) the group of taxpayers who have not yet been subjected to any action. In Figure OB.5, we plot the same statistic for the treatment group. In April and May 2021, control group taxpayers who had received no collection action settled their taxes at a much higher rate than taxpayers who received just a notification. This is not the case in the treatment group, and this is not the case in later periods.

We note that there is no evidence that the city engaged in significant selection when issuing notifications: taxpayers who are issued a notification by June are not predicted by our scoring model to be more likely to repay than those against whom no action had been taken by June (0.40 v.s. 0.41), but they do owe a higher amount of taxes on average (440 soles v.s. 338 soles).

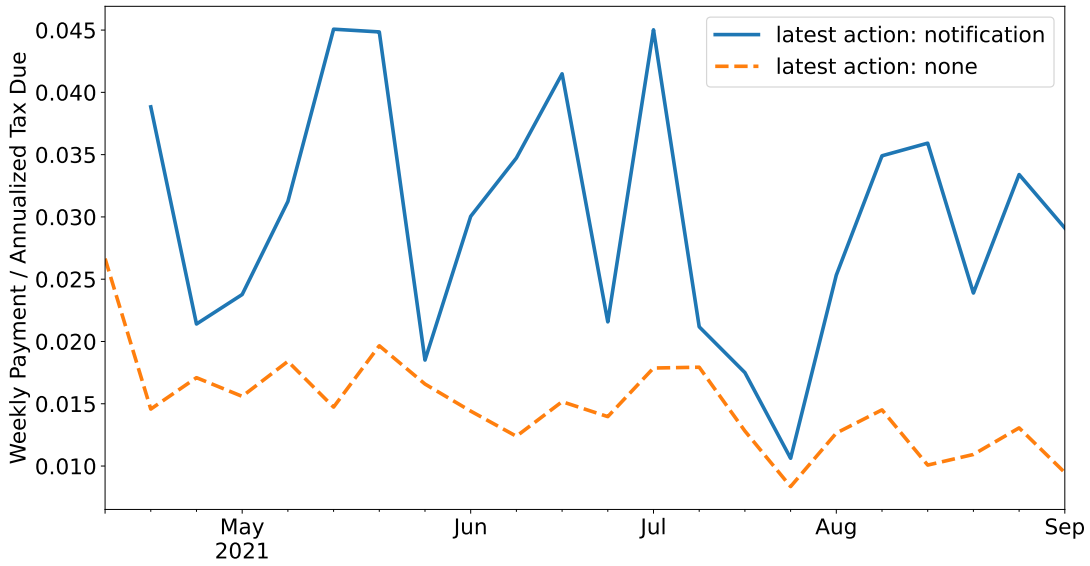


Figure OB.5: Payment given latest action (notification or none), treatment group.

Note: Each point on the blue (orange) line corresponds to the ratio of payments made in that week to total taxes due, for taxpayers in treatment whose most recent action is receiving a notification (have not been subject to any action).

Unconstrained estimation. Table OB.11 reports parameters' posterior means and standard deviations using a specification in which we do not constrain the coefficient on collection notifications to be positive. The coefficient on notifications is then -2.00%, while the coefficients on G1 priorities and writs are 3.70% and 2.19% respectively.[3]

A flexible specification. Table OB.12 reports posterior means and standard deviations for parameters of interest in an estimation with no lower bound on the coefficient on notification, but allowing the coefficient on notification to take different values before and after June 1st. The coefficient $\beta_{\text{notification}}$ is an indicator for receiving a notification any time, while $\beta_{\text{notification - post June}}$ is an indicator for receiving a notification after June 1^{st}. We find,

[3]Recall that the collection action dummy variables are exclusive: they capture the latest collection action taken. Hence the coefficient of 2.19% associated with writs captures the joint impact of receiving a notification and then receiving a writ.

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$3.11 \cdot 10^{-2}$	$(0.28 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-3.56 \cdot 10^{-2}$	$(0.13 \cdot 10^{-2})$
β_{G1}	$3.68 \cdot 10^{-2}$	$(0.32 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$-2.49 \cdot 10^{-2}$	$(0.70 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$-1.18 \cdot 10^{-2}$	$(0.55 \cdot 10^{-2})$
β_{G2}	$-0.39 \cdot 10^{-2}$	$(0.30 \cdot 10^{-2})$
β_{G3}	$-1.44 \cdot 10^{-2}$	$(0.16 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$1.08 \cdot 10^{-2}$	$(0.48 \cdot 10^{-2})$
β_{writ}	$2.19 \cdot 10^{-2}$	$(0.24 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$-2.00 \cdot 10^{-2}$	$(0.18 \cdot 10^{-2})$
β_{ξ}	$1.27 \cdot 10^{-1}$	$(0.42 \cdot 10^{-2})$
$\underline{\varphi}$	$0.35 \cdot 10^{-2}$	$(0.21 \cdot 10^{-2})$
$\overline{\varphi}$	$3.48 \cdot 10^{-1}$	$(8.89 \cdot 10^{-2})$
σ	$4.81 \cdot 10^{-2}$	$(0.24 \cdot 10^{-2})$

Table OB.11: Estimating the settlement behavior of taxpayers allowing for negative collection notification coefficient.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, but allowing for a negative notification coefficient.

consistent with Figure OB.4, that the coefficient on notifications is negative before June, but becomes approximately 0 (by adding up the two notification coefficients) after June. Other coefficients of the model are similar to those reported in Table 7.

Interpretation and policy impact. It is possible to attribute the pattern of early repayment in control to a meaningful mechanism rather than just noise. One possible interpretation is that this pattern reflects the temporary crowding out of intrinsic incentives: along the lines of Gneezy and Rustichini (2000) taxpayers interpret the notification as a clarifying price for late payment. Alternatively, taxpayers may be surprised by the relatively mild short-term penalties associated with late payment. These considerations do not apply in the treatment group since notifications are always preceded by an information letter promising

	Mean	(std. dev.)
$\beta_{\Pi_{i,t}>0}$	$2.57 \cdot 10^{-2}$	$(0.29 \cdot 10^{-2})$
$\beta_{\Pi_{i,t}}$	$-3.77 \cdot 10^{-2}$	$(0.17 \cdot 10^{-2})$
β_{G1}	$3.84 \cdot 10^{-2}$	$(0.34 \cdot 10^{-2})$
$\beta_{\text{G1-garnishment}}$	$-2.47 \cdot 10^{-2}$	$(0.70 \cdot 10^{-2})$
$\beta_{\text{G1-writ}}$	$-1.14 \cdot 10^{-2}$	$(0.60 \cdot 10^{-2})$
β_{G2}	$-0.47 \cdot 10^{-2}$	$(0.31 \cdot 10^{-2})$
β_{G3}	$-1.62 \cdot 10^{-2}$	$(0.18 \cdot 10^{-2})$
$\beta_{\text{garnishment}}$	$1.19 \cdot 10^{-2}$	$(0.50 \cdot 10^{-2})$
β_{writ}	$2.37 \cdot 10^{-2}$	$(0.25 \cdot 10^{-2})$
$\beta_{\text{notification}}$	$-5.63 \cdot 10^{-2}$	$(0.34 \cdot 10^{-2})$
$\beta_{\text{notification - post June}}$	$4.73 \cdot 10^{-2}$	$(0.33 \cdot 10^{-2})$
β_{ξ}	$1.39 \cdot 10^{-1}$	$(0.46 \cdot 10^{-2})$
$\underline{\varphi}$	$0.70 \cdot 10^{-2}$	$(0.22 \cdot 10^{-2})$
$\overline{\varphi}$	$3.45 \cdot 10^{-1}$	$(8.91 \cdot 10^{-2})$
σ	$5.51 \cdot 10^{-2}$	$(0.24 \cdot 10^{-2})$

Table OB.12: Estimating the settlement behavior of taxpayers allowing for different notification parameters before and after June.

Note: The first (second) column reports the mean (standard deviation) of parameter estimates from the MCMC procedure described in Section 6.1, but allowing for a negative notification coefficient and for separate notification coefficients before and after June.

clear short-term enforcement.

While our primary interpretation is that this pattern is noise, the potential implications for design if it were in fact persistent, are clear. While the notification is a legal constraint which cannot be eliminated, the city government should ensure that the delay between notification and writs is short. Instead of first sending all notifications, and only then sending all legal writs, it may be preferable to prioritize completing (notification, writ) pairs close together in time.

OC Further Counterfactuals

In this section, we report estimated treatment effects from additional counterfactuals.

OC.1 Other counterfactuals of interest

Uniformly random and other rankings. In Table OC.1 we replicate counterfactual CF5 using alternative rankings. Most importantly, using a uniformly random ranking has a dramatic effect on revenue, yielding a treatment effect of -2.1% percent over control.

Counterfactual Policy	% Change in Revenue		#G1	#Writs	#Garnished
	Mean Effect	(95% CI)			
CF5. CF4 + Rank by taxes due	12.3	(8.6, 15.5)	1451	3450	595
CF5a. CF4 + Rank by exogenous score	11.0	(7.3, 14.1)	1495	3450	565
CF5b. CF4 + Rank by endogenous score	10.8	(7.4, 13.8)	1551	3450	527
CF5c. CF4 + Rank by random score	-2.1	(-4.9, 0.2)	1440	3450	598

Table OC.1: Evaluation of counterfactual policy CF4 from Table 8 in the main text with different rankings.

Early credible writs. In Table OC.2 we implement a version of counterfactual CF3 that issues approximately the same number of writs as taxpayers who enter G1, but issues them immediately at the beginning of the sample period. This in contrast to CF4, which is CF3 with a writ process similar to control, scaling up to $>$ 3000 writs issued, but later in the sample period. An important aspect of this policy (in contrast to either control, or counterfactual CF4) is that all writs issued are credibly enforced: only writs leading to a G1 priority are issued.

Counterfactual Policy	% Change in Revenue Mean Effect	(95% CI)	#G1	#Writs	#Garnished
CF3 + Early credible writs	11.2	(7.3, 14.4)	1524	1491	546

Table OC.2: Evaluation of counterfactual policy CF3 from Table 8 in the main text with early writs.

Activating G2 and shutting down G3. In Table OC.3 we implement counterfactual CF5, but under alternative parameters in which the coefficient on $G2$ is set to $\frac{1}{2}$ the coefficient on $G1$ or the coefficient on $G3$ is set to 0, or both. By setting the $G3$ coefficient to 0, we shut down the negative effect of being in $G3$ relative to control which, while small for an individual taxpayer, has a large effect because so many taxpayers are in $G3$. Practically, providing no information about ranking to taxpayers in $G3$ may be beneficial.[4] By increasing the coefficient on $G2$ to $\frac{1}{2}$ the coefficient on $G1$, we simulate a scenario in which we successfully activate higher-order reasoning for tax-payers in $G2$.

Counterfactual Policy	% Change in Revenue Mean Effect	(95% CI)	#G1	#Writs	#Garnished
CF5 + $G2$ set to $\frac{1}{2}$G1	13.9	(10.3, 17.4)	1450	3450	596
CF5 + $G3$ set to 0	15.7	(12.0, 18.7)	1449	3449	596
CF5 + $G3$ set to 0, $G2$ set to $\frac{1}{2}$	17.3	(13.7, 20.6)	1448	3449	596

Table OC.3: Evaluation of counterfactual policy CF5 from Table 8 in the main text with different counterfactual assumptions about the coefficients on G2 and G3.

OC.2 Isolating the Effect of Priorities

Our treatment is a policy bundle: because we seek to implement garnishments promptly, priority G1 tends to be associated with receiving a writ early. In this section we seek to

[4]Such gains may not last though, if it becomes clear that only $G3$s receive no information.

identify the component of treatment effects associated with priorities alone.

We reproduce the first column of Table 8 in the main text, except that for each policy, we measure the change in revenue against a hypothetical control scenario, referred to as a precise control, in which the process for priorities and actions are exactly the same as in that policy, except the coefficients on priority status variables are set to 0.

For CF1, CF2, and CF3, the precise control is worse than the actual control, so that treatment effects are greater against precise controls than the actual control. For CF4, CF5, and CF6, precise controls improve over actual control, and estimated treatment effects against precise controls shrink to approximately 2/3 of treatment effects against actual control.

Counterfactual Policy	% Change in Revenue Against Precise Control Mean Effect (95% CI)
CF1. Experiment as implemented	8.8 (5.2, 11.9)
CF2. Experiment as intended	5.1 (1.4, 8.0)
CF3. Expand G1 & deadlines	7.9 (4.2, 10.9)
CF4. CF3 + Matching writs in control	7.2 (3.6, 10.3)
CF5. CF4 + Rank by taxes due	8.1 (3.9, 11.5)
CF6. Adopted policy	7.4 (3.1, 10.7)

Table OC.4: Evaluation of counterfactual policies from Table 8 in the main text against precise controls, as described in Section OC.2.

OC.3 Effect of Distribution of Taxes due

In this section, we compute two additional counterfactuals. The first row in Table OC.5 compares counterfactual CF5 to the control simulation for the population of taxpayers with tax due below 3000. The improvement over control is smaller compared to the improvement in Table OC. The second row in OC.5 performs a similar evaluation under the assumption that each taxpayer's tax due is the average tax due across the entire population. The

counterfactual policy CF5 actually induces a loss relative to control under this alternative distribution of tax due. The reason for this is that the negative coefficient on $G3$ priorities now applies to a larger fraction of total taxes due.

Counterfactual Policy	% Change in Revenue Against Control Mean Effect (95% CI)
CF5 on	
tax due < 3000	6.8 (3.9, 9.6)
homogeneous tax due	0.8 (-2.8, 2.7)

Table OC.5: Evaluation of counterfactual policy CF5 from Table 8 in the main text for different distributions of tax due.

OD Further Theoretical Analysis

We now outline how to extend the model of Section 2 to an income tax setting in which tax payers have private information about the amount of taxes $D_i \leq \overline{D}$ they would owe following a formal audit. Based on observables, the principal has a prior density f_i (with c.d.f. Q_i) over the actual tax due D_i for taxpayer i. The taxpayer knows D_i. Draws of D_i are independent across taxpayers. For simplicity, we assume that

$$\frac{1 - Q_i(D_i)}{f_i(D_i)}$$

is decreasing in $D_i \in [0, \overline{D}]$.

In this context, the collection action taken $a_i \in \{0, 1\}$ is better interpreted as an audit decision. As in Section 2 the capacity constraint is that the total audit costs $\sum_{i=1}^{N} \lambda_i a_i$ must be less than αN. The government can commit to any direct mechanism in which:

- each taxpayer i reports an amount of tax due $m_i \in [0, \overline{D}]$;

- the government recommends a payment $\widehat{P}_i$ to each taxpayer i;
- each taxpayer i chooses an actual payment P_i;
- the government implements a feasible audit profile as a function of messages, recommendations and actual payments (and can force collection of at most D_i on audited taxpayers)

The principal maximizes revenue from taxpayers who settle and forceful collection:

$$\Pi = \frac{1}{N}\sum_{i=1}^{N}(1-a_i)P_i + \rho \times \frac{1}{N}\sum_{i=1}^{N} a_i(D_i - P_i)$$

where $\rho \in \{0,1\}$ denotes the collection recovery rate from unpaid tax due.[5]

For any $P_i > 0$, let $\Gamma_i(P_i) \equiv \mathbb{E}_i[D_i | D_i < P_i]$ denote the expected tax due for a tax payer i who owes less than P_i (the distribution of taxes due is allowed to depend on observed characteristics of taxpayer i).

Proposition OD.1 (upper-bound on equilibrium revenue)**.** *Under any mechanism, in Bayes Nash equilibrium, expected tax revenue is bounded above by*

$$\max\left\{ \sum_{i=1}^{N} \delta_i \left[(1-Q_i(P_i))P_i + \rho\, Q_i(P_i)\Gamma(P_i)\right] \;\middle|\; (P_i,\delta_i)_{i\in\{1,\cdots,N\}} \in ([0,\overline{D}]\times[0,1])^N \right. \quad \text{(O1)}$$
$$\left. \text{such that } \sum_{i=1}^{N} \delta_i Q_i(P_i)\lambda_i \leq \alpha N \right\}.$$

When taxpayers can either pay a known amount D or not (as in the model of Section 2.2), then $\Gamma(D) = 0$. In that case, bound (O1) corresponds to bound (1) with an insolvency rate q_i set to $Q_i(P_i)$ for optimally chosen settlement prices P_i: intuitively, taxpayers get a take-it-or-leave-it price offer P_i and endogenously refuse to pay whenever $D_i \leq P_i$.

Importantly, conditional on an optimal choice of prices $(P_i)_{i\in\{1,\cdots,N\}}$, an analogue of Proposition 3 also holds: bound (O1) is asymptotically attained by setting optimal settlement

[5]For simplicity we focus on the case where the recovery rate is either 0 or 1.

prices P_i, and implementing a prioritized enforcement scheme using score

$$z_i \equiv \frac{(1 - Q_i(P_i))P_i + \rho\, Q_i(P_i)\Gamma(P_i)}{\lambda_i Q_i(P_i)}.$$

Note that while optimizing over $(\delta_i)_{i\in\{1,\cdots,N\}}$ in (O1) is immediate, optimizing over $(P_i)_{i\in\{1,\cdots,N\}}$ may be computationally demanding.

Proof. Consider a Bayes Nash equilibrium of a direct mechanism. A feasible auditing policy must satisfy the following constraint in expectation:

$$\mathbb{E}\left(\sum_{i=1}^{N} \lambda_i a_i\right) \leq \alpha N.$$

Consider a given taxpayer i with equilibrium audit probability $\mathbb{E}(a_i) = \overline{\alpha}_i$. Because the audit constraint in expectation is a relaxation of the ex post feasibility constraint, expected collection from i is lower than the highest expected collection from i under any individual collection mechanism such that $\mathbb{E}(a_i) \leq \overline{\alpha}_i$.

Let us denote by $\overline{a}_i(D_i)$ the audit probability of a taxpayer that discloses tax due D_i, and asked to make a payment $P_i(D_i)$. The expected payoff of a taxpayer with true tax due D_i, reporting tax due D_i', and obeying recommendation $P_i(D_i')$ is

$$-\widehat{P}_i(D_i') - \overline{a}_i(D_i')(D_i - P_i(D_i')).$$

Observing that the payoff of a taxpayer with tax due 0 is 0, incentive compatibility and the usual application of the envelope theorem yields the payoff formula

$$-P_i(D_i) - \overline{a}_i(D_i)(D_i - P_i(D_i)) = -\int_0^{D_i} \overline{a}_i(D)\mathrm{d}D. \tag{O2}$$

When recovery rate $\rho = 0$, this implies that the expected collection from tax payer i is

bounded above by

$$\max_{\overline{a}_i} \int_0^{\overline{D}} \left[\int_0^{D_i} \overline{a}_i(D) \mathrm{d}D - \overline{a}_i(D_i) D_i \right] f_i(D_i) \mathrm{d}D_i \tag{O3}$$
$$\overline{a}_i \text{ s.t. } \int_0^{\overline{D}} \overline{a}_i(D_i) f_i(D_i) \mathrm{d}D_i \leq \overline{\alpha}_i.$$

Letting $\mu \geq 0$ denote the Lagrange multiplier on the auditing constraint, and applying Fubini's theorem, this means that the audit policy $\overline{a}_i$ solving (O3) solves

$$\max_{\overline{a}_i} \int_0^{\overline{D}} \overline{a}_i(D_i) \left[1 - Q_i(D_i) - (D_i + \mu) f_i(D_i) \right] \mathrm{d}D_i \tag{O4}$$

Similarly, when recovery rate $\rho = 1$, (O2) implies that the expected tax collection from taxpayer i is bounded above by

$$\max_{\overline{a}_i} \int_0^{\overline{D}} \int_0^{D_i} \overline{a}_i(D) f_i(D_i) \mathrm{d}D \mathrm{d}D_i \tag{O5}$$
$$\overline{a}_i \text{ s.t. } \int_0^{\overline{D}} \overline{a}_i(D_i) f_i(D_i) \mathrm{d}D_i \leq \overline{\alpha}_i.$$

Letting $\mu \geq 0$ denote the Lagrange multiplier on the auditing constraint, and applying Fubini's theorem, this means that the audit policy $\overline{a}_i$ solving (O5) solves

$$\max_{\overline{a}_i} \int_0^{\overline{D}} \overline{a}_i(D_i) \left[1 - Q_i(D_i) - \mu \times f_i(D_i) \right] \mathrm{d}D_i \tag{O6}$$

In both cases, since $\frac{1-Q_i(D_i)}{f_i(D_i)}$ is decreasing in D_i it follows that an audit policy $\overline{a}_i^*$ solving (O3) or (O5) will take a threshold form: there exists D_i^* such that for all $D_i > D_i^*$, $\overline{a}_i^*(D_i) = 0$, while for all $D_i < D_i^*$, $\overline{a}_i^*(D_i) = 1$. In turn, for all $D_i > D_i^*$, $P_i(D_i) = D_i^*$. In other terms the optimal individual taxation policy is a posted settlement price. If the taxpayer accepts, then no audit takes place. If the taxpayer refuses, an audit takes place with probability 1.

This implies that collection under any mechanism is bounded above by

$$\max\left\{\sum_{i=1}^{N}(1-Q_i(P_i))P_i+\rho\,Q_i(P_i)\Gamma_i(P_i)\;\middle|\;(P_i)_{i\in\{1,\cdots,N\}}\text{ such that }\sum_{i=1}^{N}Q_i(P_i)\lambda_i\leq\alpha N\right\}$$
$$=\max\left\{\sum_{i=1}^{N}\delta_i\left[(1-Q_i(P_i))P_i+\rho\,Q_i(P_i)\Gamma(P_i)\right]\;\middle|\;(P_i,\delta_i)_{i\in\{1,\cdots,N\}}\in([0,\overline{D}]\times[0,1])^N\right.$$
$$\left.\text{such that }\sum_{i=1}^{N}\delta_iQ_i(P_i)\lambda_i\leq\alpha N\right\}$$

where the point of the last equality is to highlight that as in the case of Proposition (2), given prices P_i, the optimal policy offers all taxpayers with score

$$z_i\equiv\frac{(1-Q_i(P_i))P_i+\rho Q_i(P_i)\Gamma(P_i)}{\lambda_iQ_i(P_i)}$$

greater than some threshold z^* a take-it-or-leave-it settlement offer at price P_i, under the threat of audit if they do not accept, while taxpayers with scores z_i less than z^* are not audited even if they do not settle. □

OE Laboratory Evidence

Ahead of field implementation, and to refine our understanding of various implementations of divide and conquer, we ran lab experiments on Amazon Mechanical Turk (MTurk), whose main goal was to compare settlement behavior under random enforcement, prioritized static enforcement, and prioritized iterative enforcement.

OE.1 Experiment Design

We ran two rounds of laboratory experiments replicating the formal tax collection games introduced in Section 2. The first round of experiments were run between March 2020 and August 2020, and helped refine our field implementation choices. The insolvency rate q was

set to 20%. Unfortunately, logistical constraints limited the number of participants in any game to $N = 10$. This means that the large N results provided in Section 2 did not apply, making the link between theory and laboratory experiment less clear.

For this reason, we ran a second round of experiments in which insolvency rate q was set to 0 to ensure that the analysis of Section 2 would continue to apply even though N is not large. For simplicity we only report findings from this second round of lab experiments. Results from our first round are almost identical, and discussed in Appendix C of Chassang et al. (2020).

Baseline game. Our second round of experiments was run on MTurk from August to October of 2021. Because of the difficulty of simultaneously recruiting sufficiently many reliable players, and to allow multiple treatments to be run at the same time, we set the number of agents N to 10. As was already mentioned, the insolvency rate q was set to 0.

The experimenter played the role of the principal, and recruited participants playing the role of agents. All agents received an initial endowment of 100 points and owed the same amount $D = 100$. In our three main treatment arms, the initial settlement price was set to $P_0 = 89$, and increased linearly over time up to $P_1 = 91$. In a fourth treatment arm, the initial settlement price was set to $P_0 = 80$ and increased to $P_1 = 91$. Time $t = 1$ corresponded to 45 seconds.

The principal's enforcement capacity was set to $\alpha = 10\%$, so that the principal can physically collect taxes from a single agent. To reduce sampling variation, the players were able to settle at some time randomly drawn without replacement from the set of 10 equidistant points between 5 seconds and 36 seconds.[6]

Treatments. We implemented three main treatments corresponding to different enforcement policies and different information structures. Under these three treatments, the initial

[6]The buffer at the beginning was to ensure that any minor latency issues in the software would not impede play, while the buffer at the end ensured that a player had sufficient time to settle if they wanted to.

settlement price was set to $P_0 = 89$, with a final settlement price at $P_1 = 91$.

In the random enforcement treatment, participants were not informed of the order in which enforcement would occur, and did not receive information about the settlement behavior of others. Players were simply made aware of when it was possible for them to settle, and at what price.

The other two main treatments implemented a prioritized enforcement rule, in which participants were informed of their enforcement priority, but received different additional information over time:

- In the priority+no-info treatment, players were given no information about the realized settlement of others.
- In the priority+info treatment, players were informed of their *real time effective rank*, i.e. their updated rank after taking into account settlement by other players.

  This corresponds to PIE.

Finally, a fourth priority+info+stakes treatment replicated the priority+info treatment but increased the incentives for fast settlement by setting initial settlement price to $P_0 = 80$ and final settlement price to $P_1 = 91$.

Protocol. The experiment design was filed with the AEA RCT registry under ID number AEARCTR-0004802. The experiment was programmed in oTree (Chen et al., 2016) and experimental instructions were conveyed to players through their browser. Screenshots of instructions are reproduced in Online Appendix OE.3.

Because of the difficulty of recruiting many MTurk users to play simultaneously, we did not implement all four treatments jointly at all times. Instead we implemented overlapping joint sessions along the lines described by Figure OE.1. When we compare different treatment outcomes, we focus on the subset of overlapping sessions for the relevant treatments.[7]

[7]Specifically, we ran 7 sessions, each with 30 participants randomly assigned to one of three treatments: random, priority+no-info, priority+info. To understand the role of steeper incentives to settle early, we ran 10 sessions with 20 participants randomly assigned to either priority+info or priority+info+stakes. Finally, we ran 3 sessions with 20 participants randomly assigned to random or priority+no-info. Altogether, we ran 10

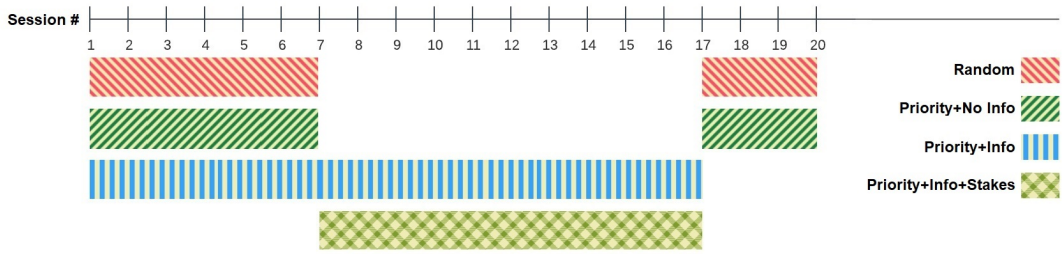


Figure OE.1: treatment overlap across sessions

Participants played the collection game 5 times. The first collection game did not count towards participants' final payoff. Points earned in the last four collection games were averaged across games, and converted to cash at the rate of USD 8 for 100 points. Players were *not* reallocated across different treatments over time.

Participants earned a USD 3.5 fee for showing up at a pre-announced time. The experiment began once the required number of participants arrived. Participants earned between USD 0 and USD 8 from their play in the collection game, with mean total earnings at approximately USD 6. Participants played for an average of 25 minutes. Participants were selected from a pool of US adults over 18 years old, with an MTurk approval rate over 98% and who had completed at least 10 tasks on MTurk.

OE.2 Findings

OE.2.1 Is prioritized enforcement effective and when?

Mean settlement by treatment. Table OE.1 displays results from regressing settlement rates and tax revenue on treatment status for the 7 overlapping sessions of treatments random, priority+no-info, and priority+info. Treatment random is the omitted category.

Three observations are immediate. First, players do not play the high settlement equi-

sessions of each treatment, except for priority+info, of which we ran 17.

Table OE.1: Settlement rates and revenues across treatments.

	settlement rate	tax revenue (per person)
constant	0.443	39.86
priority+no-info	0.068 (0.271)	6.109 (0.359)
priority+info	0.318 (0.000)	28.72 (0.000)
Observations	840	840

Two-sided p-values in parentheses. Standard-errors are clustered at the (treatment, session) level.

librium under random enforcement: roughly 44% of players settle, compared to a 100% theoretical bound under the high settlement equilibrium.

Second, while the priority+no-info treatment increases settlement rates and revenues, it fails to implement full settlement by a large margin. It improves settlement rates by 6.8pp (or 15.3%).[8]

Third, the priority+info treatment does a much better job of reducing the distance to full settlement. It increases settlement rates by 31.8pp (or 71.8%). Effects on revenues are similar.

Altogether, these findings show that in our context, non-obviously dominated play appears to be a much better suited solution concept than either selecting the high settlement equilibrium, or rationalizability.

Distributional effects. The distribution of group-level settlement rates is also instructive. Figure OE.2 plots the c.d.f. of group-level settlement rates, computed at the (session, treatment, round) level, by treatment.

Two facts are noteworthy. First, the priority+info treatment induces a first-order stochastic dominance (FOSD) increase in settlement rates. In addition, although the mean impact

[8]The effect is significant at the 10% level if we use the 10 overlapping sessions of the random and priority+info, with a magnitude of 7pp.

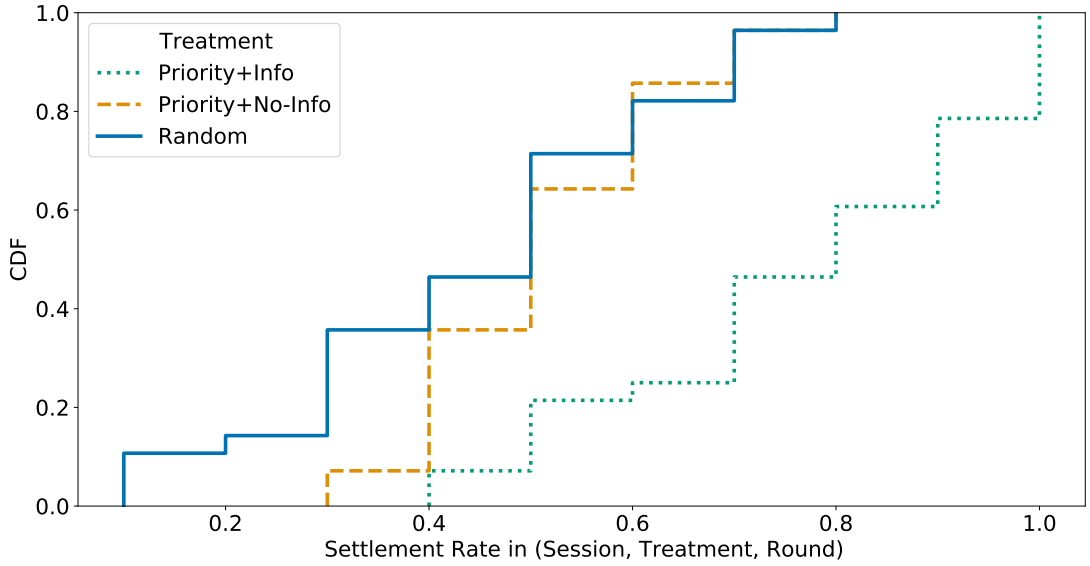


Figure OE.2: Cumulative distribution function of settlement rate by treatment.

of priority+no-info over random is small, priority+no-info does seem to effectively reduce the left tail of outcomes. In data from the 10 overlapping sessions between the two treatments, it raises the 20^{th} percentile of settlement rates from 30% to 40% (p-value 0.057). This can be viewed as an improvement in the equity of taxation across groups. Intuitively this finding makes sense since settling is dominant for at least one player under priority+no-info, while a settlement rate of 0 is an equilibrium under random enforcement.

OE.3 Player instructions

This section reproduces instructions given to participants in different treatments.

OE.3.1 Instructions for Priority - Info

Introduction

You are about to participate in an experiment. During this experiment you have the opportunity to earn a sum of money that will be paid to you at the end of the experiment. The amount of money you earn may be larger if

- you read the instructions carefully.
- you think carefully about the decisions you make.

In today's experiment, you will interact with other participants via your computer. Your decision as well as others' will affect your payoff, which is calculated in points. The experiment consists of a number of rounds, and at the end of the experiment we will calculate your **average payoff (in points) across rounds**. We then convert this average into US Dollars (USD) according to the following exchange rate:

100 points = USD 8

To compute your final payment, we add to this a USD 3.5 participation fee for the experiment.

Summary of the Experiment

In this experiment, you and other participants interact with an automated *collection authority*. General details are:

- there are 10 participants in this experiment, including you
- all participants read the same set of instructions
- there are 5 rounds including 1 practice round
- each round consists of 2 stages
  - stage 1: *settlement stage*
  - stage 2: *collection stage*

Stages Overview

Stage 1: Settlement Stage

You start each round with **100** points. At the beginning of the round, you will enter the settlement stage with the other participants. The collection authority (CA) offers you and all other participants an identical settlement opportunity to keep a number of points. During the settlement stage, you will have **45** seconds to accept the offer made by the CA. Further details of the settlement stage are given in the *Settlement Stage — Details* tab.

Stage 2: Collection Stage

The CA is able to *investigate* **1 participant**. If the CA investigates you, then you will certainly pay 100 points. If you accepted a settlement offer in the settlement stage, the CA will certainly not investigate you. Details of the investigation and collection procedure are given in the *Collection Stage — Details* tab.

Collection Stage — Details

The collection authority (CA) will choose to investigate according to a pre-specified line. You will be assigned an initial position in line at the start of the settlement stage, with no two participants assigned the same position. The **one** participant with the **lowest** initial position in line **among those who do not accept a settlement offer** is investigated and forced to pay 100 points, leaving that participant with a payoff of 0 points in the round. The lowest position is 1 and the highest is 10. Participants who do not accept a settlement offer and are not investigated pay 0 points, leaving each of them with a payoff of 100 points in the round. If all participants accept a settlement offer, the CA does not investigate anybody.

Settlement Stage — Details

Your Decision

You start the round with 100 points. You will be offered a settlement by the collection authority to keep a number of points — this number decreases over time. The initial settlement offer is to keep **11** points. This offer decreases by **0.045** per second, and the final settlement offer is to keep **9** points. If you accept the offer in the settlement stage, the number of points you accept is your payoff in the round. If you do not accept the offer by the deadline, your payoff in the round depends on the outcome of the collection stage described in the *Collection Stage — Details* tab.

Delayed Decision Opportunity

The button to accept a settlement offer may not be immediately available. The button will become available after a random amount of time, before the end of the settlement stage. Once the acceptance button becomes available, it will stay available until the end of the settlement stage.

Information

You will receive information about your *current position in line* to be investigated, which is a value that is updated continuously throughout the settlement stage. At the start of the round, your current position in line is equal to your initial position in line. Afterwards, any time a participant with an initial position in line lower than yours accepts a settlement offer, your current position in line decreases by 1. In general, if your current position in line to be investigated is X, you will be shown the phrase, **Your current position in line to be investigated is X.**

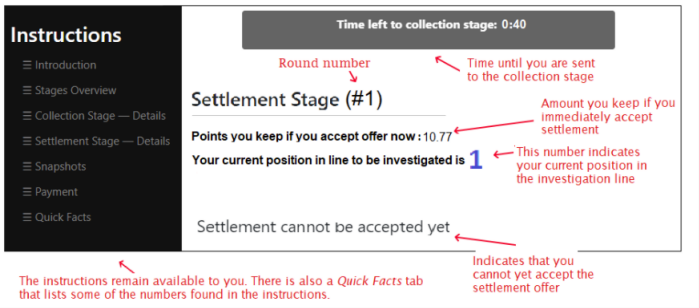
Other Participants

All other participants are offered the same settlement. Their buttons become available after a random amount of time, before the end of the settlement stage.

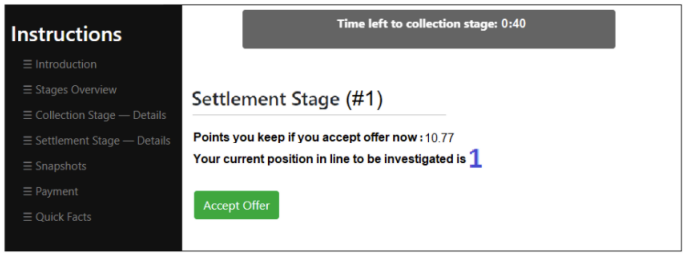
Snapshots

Below we produce example snapshots of the screens you will see in each round. Text in red is commentary describing the page — please read these comments so you understand the screen.

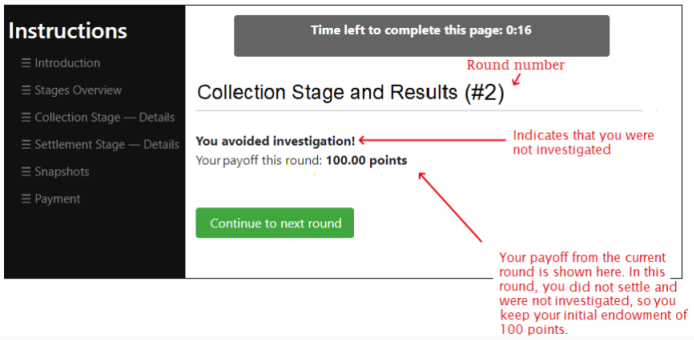
The snapshot below shows an example of the settlement stage screen.



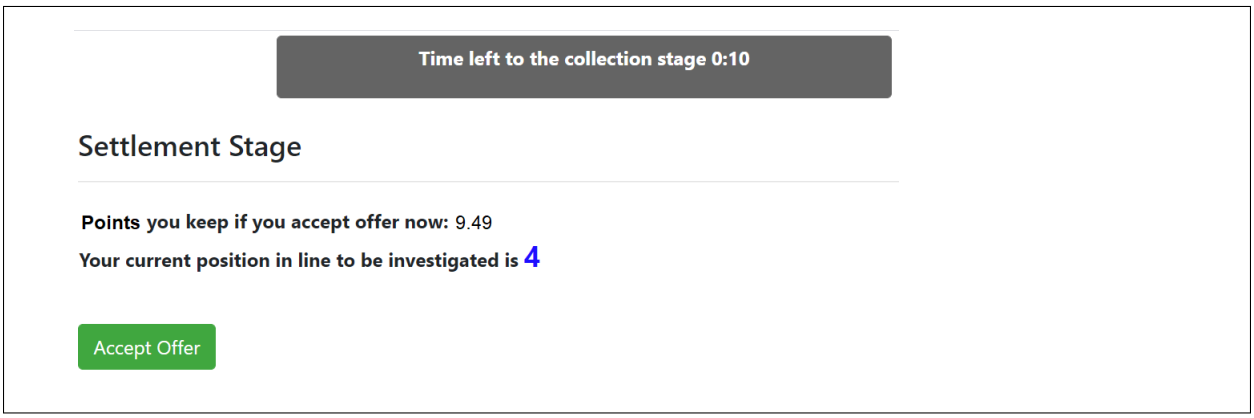
Next we produced a snapshot of an example of the settlement stage once the "accept offer" button becomes available.



At the end of the round, you will see a results page. Below is an example of the results page for a case in which the participant did not accept a settlement offer and was not investigated.

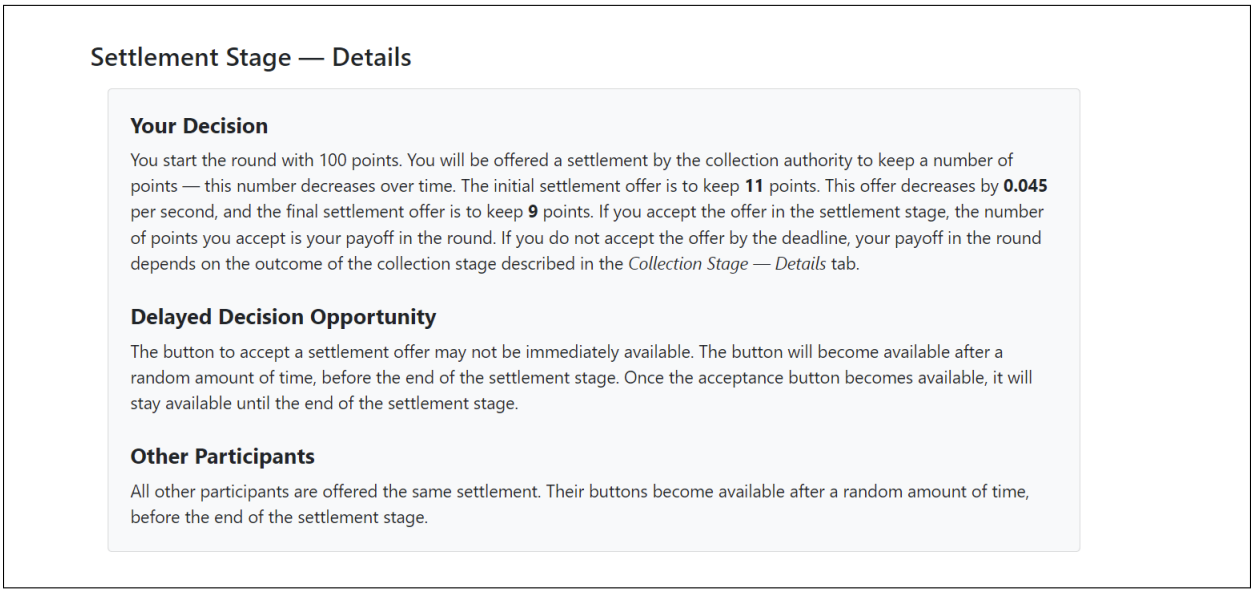


During the game, players were shown the following screen. Whenever a player was unable to settle, the “Accept Offer" button was deactivated.



OE.3.2 Instructions for Priority - No Info Treatment

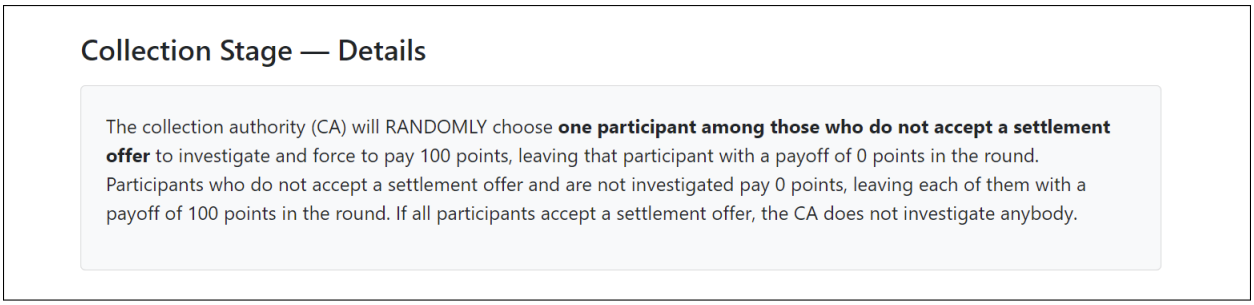
The instructions are identical to the priority - info treatment, except for the description of the collection stage (and the snapshots page).



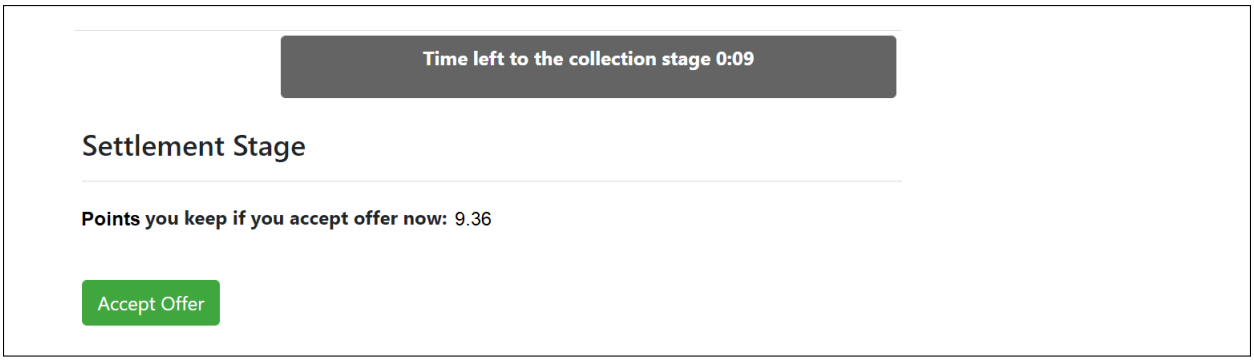
During the game, players were shown the following screen with their *initial rank*.

OE.3.3 Instructions for Random Treatment

The instructions are identical to the priority-no info treatment, except for the description of collection (and the snapshots page).



During the game, players were shown the following screen.



OF Organizational Details

OF.1 Ranking taxpayers

As we highlighted in the main text, the central challenge of ranking consists in predicting taxpayers' probability of repayment.

We used repayment data from 2019 and 2020, as well as information obtained by the government from credit rating agencies to build a simple predictive model of repayment behavior following delinquency. We set as our predicted variable of interest

$$Y = \mathbf{1}_{\text{3M repayment}>20\%}$$

i.e. the binary variable equal to 1 whenever the taxpayer repays at least 20% of their debt within 3 months of the debt becoming due. The threshold 20% was chosen in order to maximize the variance of the outcome variable: roughly 50% of taxpayers meet that threshold.

Endogenous vs. exogenous covariates. We used covariates listed in Table OF.1, all of which are normalized to take values in $[0, 1]$. We distinguish models by whether or not they use the share of taxes repaid in the last year as a covariate. The difficulty here is that if the mechanism assigns a low collection rank based on past failures to pay, then it provides dynamic incentives not to make repayments: repayment behavior is endogenous. Everything else equal, we would prefer to use only exogenous covariates, but we wanted to evaluate the potential gains from using endogenous information. We refer to models using past repayment as endogenous, and to models excluding past repayments as exogenous.

We fit linear, LASSO, and Random Forest models on training data using k-fold cross-validation. Table OF.1 reports coefficients from LASSO. As expected, past repayment behavior is a key predictor of current repayment. Having an email address, and a mobile phone

Covariate	Exogenous covs only	Incl. Endogenous covs
Taxpayer lives in the district	0	0
Has email	0.155	0.104
Has cellular	0.091	0.077
Is employed	0.074	0.048
Has education	0.011	0
Quantile of total tax due	0.302	0.200
Quantile of property tax due	0	0
Quantile of user charges due	0.031	0.029
Quantile of tax base	0	0
Quantile of credit score rating	0.034	0
Quantile of salary	0	0
Quantile of year of most recent car	0	0
Quantile of age	0.062	0.008
Quantile of past delinquency	-0.010	0
Last year's share repaid (by 3 months)	—	0.370
Num Observations	7940	7940

Table OF.1: LASSO Coefficients with and without endogenous covariate

are also important predictors, possibly for selection reasons, or because these make it much easier for city officials to get in touch with the taxpayer.

We then evaluate all three models on 3441 out-of-sample data points by ranking taxpayers according to their predicted probability of repaying at least 20% of tax due within 3 months, and computing the share of tax payers who actually do repay. Figure OF.1 summarizes results. There are three main takeaways. First, estimated ranks have predictive power: with 70 to 90% of highest ranked taxpayers being in partial repayment status within 3 months, and between 10 to 25% of the lowest ranked taxpayers being in partial repayment within 3 months. Second there is little difference across the linear, LASSO, and Random Forest models. Finally, while using endogenous past repayment behavior improves on the ranking of taxpayers (the curve of actual repayment shares is steeper, by construction it must have the same integral), the difference is not large. This suggests that excluding endogenous variables does not come at a high efficiency cost.

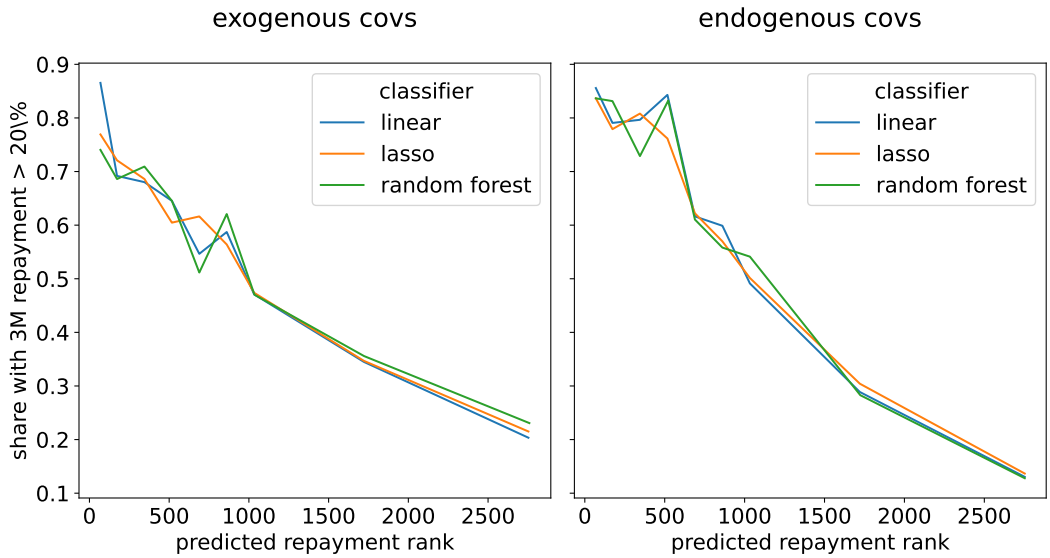


Figure OF.1: Classification performance, with exogenous and endogenous covariates.

We assign each taxpayer i a subjective settlement probability $1 - q_i$ equal to the out-of-sample share of taxpayers with similar predicted repayment rate, repaying more than 20% of their taxes within 3 months. We average predictions across linear, LASSO, and random forest models. Half of treated taxpayers are assigned a subjective probability of repayment $1-q_i$ based on models excluding endogenous covariates, half of treated taxpayers are assigned a subjective probability of repayment $1-q_i$ based on models including exogenous covariates. The randomization is performed using the same balance objectives as in Section 4.

Progressivity. Under revenue-maximizing score (2), PIE may be regressive. For instance, if taxpayers who owe relatively little are also very likely to repay, while taxpayers who owe large amounts are unlikely to repay, then scoring rule

$$z_i = \frac{(1 - q_i)D_i}{q_i}$$

may rank taxpayers who owe little ahead of taxpayers who owe large amounts. Fortunately this is not the case in our application. As Table OF.1 highlights, the predicted probability of

non-repayment q_i is decreasing in amount of tax due: taxpayers who owe more are therefore ranked ahead of taxpayers who owe less. As a result, we should expect PIE to enhance the progressivity of tax-collection.

OF.2 Operational Logistics

Responsibilities. The research team provided software to score taxpayers, track payments, and make weekly assignments to different priority groups. Employees of the municipality took over labor intensive and taxpayer facing steps such as entering data, issuing notification letters, processing payments, making phone calls to taxpayers, and issuing garnishments.

For the majority of the tax collection team (9 out of 16 employees), the nature of the tasks performed were not affected by the experiment. This is the case for:

- 1 employee issuing initial notifications ("valor")
- 7 employees (the legal team) responsible of issuing writs and garnishments
- 1 employee responsible of delivering legal communications to taxpayers' residences (who works with a team of 12 subcontractors)

These employees were just provided lists of instruments to be issued or delivered, and we can use accounting reports to assess time used in treatment and control activities. Estimates reported in Table OF.2 (see below) suggest that control activities took 60% of the collection unit's time, and treatment 40%.

The 7 remaining team-members, the "collection agents", have direct contact with taxpayers. Their roles were assigned as follows:

- The most experienced agent, who also acted as team leader, was dedicated to collection from the top 500 largest taxpayers. The agent followed protocols associated with the

taxpayer's treatment assignment, and was tested to make sure the protocol of each treatment arm was followed.

- The 6 other agents engage with the remaining taxpayers (in our experiment more than 12,500). Each treatment arm was assigned 3 agents who rotated every 3 weeks. We monitored the overall input use of this group, and call statistics are balanced.

	Notifications	**Writs**	**Garnishment**	**G1 Card**	**Total**
Unitary cost (S/.)	2.73	4.6	67.17	1.83	
Time use (minutes)	15.23	17.42	167.13	5.08	
Total actions - Control	4314	3620	531	0	
Total actions - Treatment	1573	1306	533	1800	
Total cost in Soles - Control	11777	16652	35667	0	64096
Total cost in Soles - Treatment	4294	6008	35802	3294	49398
Total time cost in hours - Control	1095	1051	1479	0	3625
Total time cost in hours - Treatment	399	379	1485	152	2415

Table OF.2: Time and monetary cost of collection actions

OF.3 Communication Materials

Figures OF.2, OF.3, OF.4, OF.5, OF.6, and OF.7 report the original information letters sent to taxpayers in treatment groups G1, G2, and G3, as well as their Enlighs translations. Figures OF.8 provide the template for information letters sent to the control group, with English translation in Figure OF.9. The treatment and control groups were sent identical notifications (*Valor*, Figure OF.10, with English translation in Figure OF.11) and legal writs (*REC1*, Figure OF.12, with English translation in Figure OF.13). From Q1 to Q2, there were two changes to the information letters sent to treatment and control. First, in Q2, the (English translated) text "The coercive collection process will start at the latest on:" in the G1 and G2 information letters was changed to "The coercive seizure process (Bank

Withholding or Deposit of Assets) will start at the latest on:"[9] Second, in the information letters, we added a line between the "Weekly interest" and "Payment options" sections that reads (in the English translation): "This notice is sent so that you have clarity about your debts and the next steps for collection."[10]

[9]In the original Spanish, "El proceso de Embargo Coactivo (Retención Bancaria o Depósito de Bienes) se iniciará a más tardar el día:"

[10]In the original Spanish, "Se remite el presente aviso con la finalidad de que tenga claridad acerca de sus deudas y los próximos pasos para su cobranza."

Municipalidad de Jesús María

GERENCIA DE ADMINISTRACIÓN TRIBUTARIA Y RENTAS

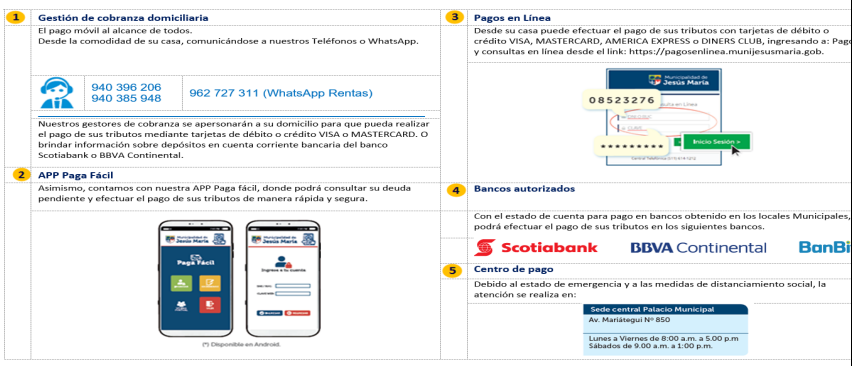
Jesús María, Fecha

Aviso de Deuda Pendiente y Cobranza Inminente

Estimado contribuyente **Nombre**
Dirección **DIRECCION**

Le recordamos que tiene la siguiente deuda pendiente con el municipio*:		**Monto Deuda**: **S/ Monto_Deuda**
*Por concepto de:	1era cuota predial 1era cuota predial + Arbitrios 2021	
El proceso de cobranza coactiva **se iniciará a más tardar** el día:		**Fecha límite:** **Fecha + 6 semans**
Y la cobranza **puede ser iniciada en cualquier momento** y sin previo aviso.		
Si se inicia el proceso de cobranza coactivo, su deuda incluirá las gastos y costas procesales reguladas por Ley y ascenderá al monto de **:		**Monto Deuda con Gastos Adicionales:** **S/Monto_Deuda *1.1 + US$35**
**Incluye gastos administrativos de 10% y otros derechos de emisión		
Además de acumular un interés semanal de:	**Interés semanal** **S/ Interes_semanal**	

Le recordamos que **le conviene pagar inmediatamente** para evitar costos mayores. Use nuestros siguientes canales de pago:



Si quiere pagar y no puede, llámenos o escríbanos para evaluar las opciones de pago:

Whats App
962 727 311 / 940 396 206 / 940 385 948

servicios_rentas@munijesusmaria.gob.pe

Figure OF.2: Information letter template, priority group G1, Q1

Municipality of Jesús María

TAX AND REVENUE ADMINISTRATION OFFICE

Jesús María, Date

Notice of Pending Debt and Imminent Collection

Dear taxpayer **Name**

Address: **Address**

We remind you that you have the following debt outstanding with the municipality*:	**Debt Amount**: **S/. Amount_Debt**
*By concept of: Q1 Property tax / Q1 Property tax and User charges	
The coercive collection process **will start at the latest on**:	**Deadline:** **Date + 6 weeks**
and it **can start at any time** and without prior warning.	
If the coercive collection process is started your debt will include the penalties and administrative expenses regulated by law and will amount to**:	**Debt Amount with Additional Expenses:** **S/.Amount_Debt*1.1 + US$35**
**Includes administrative expenses of 10% and other debt issuance rights	
In addition to accruing a weekly interest of: **Weekly Interest** **S/ Weekly_interest**	

We remind you that **it is on your own interest to pay immediately** to avoid higher expenses. You can use any of the payment options listed below:

1 Home collection

Mobile payment available to everyone.
From the comfort of your home, contact our phones or WhatsApp.

940 360 206
940 385 948

962 727 311 (Whatsapp Revenues)

Our collection managers will come to your home so that you can pay your taxes using VISA or Mastercard debit or credit cards. Or provide information regarding deposits in a Scotiabank or BBVA Continental bank checking account.

2 App "Easy Pay"

Likewise, we have our Easy Pay App, where you can check your pending debt and pay your taxes quickly and safely.

(*) Available on Android

3 Online payments

From home, you can pay your taxes with Visa, Mastercard, American Express or Diners Club debit or credit cards, by going to: "Online payments and inquiries" from the link: https://pagosenlinea.munijesusmaria.gob

4 Authorized banks

With the bank payment account statement obtained at municipal premises, you can pay your taxes at the following banks:

Scotiabank BBVA Continental BanBif

5 Payment center

Due to the state of emergency and social distancing measures, attention is provided at:

Municipal Palace Headquarters
Av. Mariátegui N.850
Monday to Friday from 8AM to 5PM Saturday from 9AM to 1PM

If you want to pay and cannot, call or write to us to evaluate payment options:

Whats App
962 727 311 / 940 396 206 / 940 385 948

servicios_rentas@munijesusmaria.gob.pe

Figure OF.3: Information letter template, priority group G1, Q1 - English translation

Municipalidad de Jesús María

GERENCIA DE ADMINISTRACIÓN TRIBUTARIA Y RENTAS

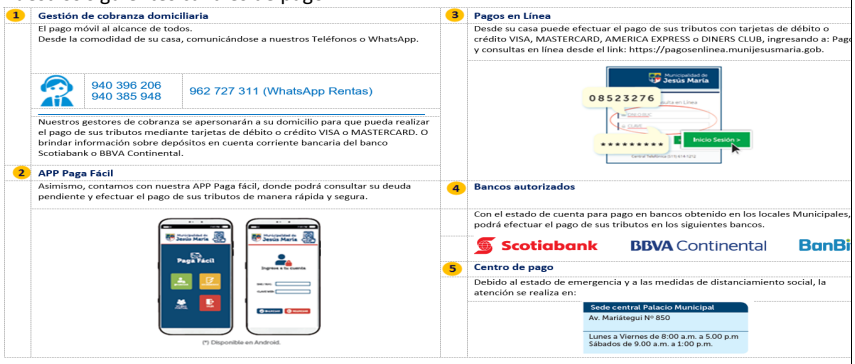
Jesús María, Fecha

Aviso de Deuda Pendiente y Cobranza Inminente

Estimado contribuyente **Nombre**

Le recordamos que tiene la siguiente deuda pendiente con el municipio*:		**Monto Deuda**: **S/ Monto_Deuda**
*Por concepto de:	1era cuota predial 1era cuota predial + Arbitrios Ene-Feb 2021	
El proceso de cobranza coactiva **se iniciará a más tardar** el día:		**Fecha límite:** **Fecha + 12 semanas**
Y su deuda **puede pasar en cualquier momento y sin previo aviso al grupo de máxima prioridad** (lo que implicará el inicio del proceso de cobranza coactivo en máximo 6 semanas).		
Si se inicia el proceso de cobranza coactivo, su deuda incluirá las gastos y costas procesales reguladas por Ley y ascenderá al monto de **:		**Monto Deuda con Gastos Adicionales:** **S/Monto_Deuda * 1.1 + US$35**
**Incluye gastos administrativos de 10% y otros derechos de emisión		
Además de acumular un interés semanal de:	**Interés semanal** **S/ Interes_semanal**	

Le recordamos que **le conviene pagar inmediatamente** para evitar costos mayores. Use nuestros siguientes canales de pago:



Si quiere pagar y no puede, llámenos o escribanos para evaluar las opciones de pago:

Whats App
962 727 311 / 940 396 206 / 940 385 948

servicios_rentas@munijesusmaria.gob.pe

Figure OF.4: Information letter template, priority group G2, Q1

Municipality of
Jesús María

TAX AND REVENUE ADMINISTRATION OFFICE

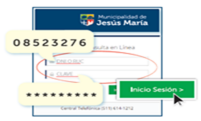
Jesús María, Date

Notice of Pending Debt and Imminent Collection

Dear taxpayer **Name**

We remind you that you have the following debt outstanding with the municipality*:		**Debt Amount**: **S/. Amount_Debt**
*By concept of:	Q1 Property tax Q1 Property tax and User charges	
The coercive collection process **will start at the latest on**:		**Deadline:** **Date + 12 weeks**
And your debt **can be moved at any time and without prior notice to the highest priority group** (which will imply the start of the coercive collection process in a maximum of 6 weeks).		
If the coercive collection process is started your debt will include the penalties and administrative expenses regulated by law and will amount to**:		**Debt Amount with Additional Expenses:** **S/.Amount_Debt*1.1 + US$35**
**Includes administrative expenses of 10% and other debt issuance rights		
In addition to accruing a weekly interest of:	**Weekly Interest** **S/ Weekly_interest**	

We remind you that **it is on your own interest to pay immediately** to avoid higher expenses. You can use any of the payment options listed below:

1	**Home collection** Mobile payment available to everyone. From the comfort of your home, contact our phones or WhatsApp. 940 360 226 940 385 948 962 727 311 (Whatsapp Rentas) Our collection managers will come to your home so that you can pay your taxes using VISA or Mastercard debit or credit cards. Or provide information regarding deposits in a Scotiabank or BBVA Continental bank checking account.	3	**Online payments** From home, you can pay your taxes with Visa, Mastercard, American Express or Diners Club debit or credit cards, by going to: "Online payments and inquiries" from the link: https://pagosenlinea.munijesusmaria.gob 
2	**App "Easy Pay"** Likewise, we have our Easy Pay App, where you can check your pending debt and pay your taxes quickly and safely.  (*) Available on Android	4	**Authorized banks** With the bank payment account statement obtained at municipal premises, you can pay your taxes at the following banks: Scotiabank BBVA Continental BanBif
		5	**Payment center** Due to the state of emergency and social distancing measures, attention is provided at: **Municipal Palace Headquarters** Av. Mariátegui N.850 Monday to Friday from 8AM to 5PM Saturday from 9AM to 1PM

If you want to pay and cannot, call or write to us to evaluate payment options:

Whats App
962 727 311 / 940 396 206 / 940 385 948

servicios_rentas@munijesusmaria.gob.pe

Figure OF.5: Information letter template, priority group G2, Q1 - English translation

Municipalidad de Jesús María

GERENCIA DE ADMINISTRACIÓN TRIBUTARIA Y RENTAS

Jesús María, Fecha

Aviso de Deuda Pendiente

Estimado contribuyente **Nombre**

Le recordamos que tiene la siguiente deuda pendiente con el municipio*:		**Monto Deuda**: **S/ Monto_Deuda**
*Por concepto de:	1era cuota predial 1era cuota predial + Arbitrios Ene-Feb-Mar 2021	
Y que su deuda puede pasar **en cualquier momento y sin previo aviso** al **grupo de cobranza prioritaria** (lo que implicará el inicio del proceso de cobranza coactivo en máximo 12 semanas).		
Si se inicia el proceso de cobranza coactivo, su deuda incluirá las gastos y costas procesales reguladas por Ley y ascenderá al monto de **:		**Monto Deuda con Gastos Adicionales:** **S/Monto_Deuda * 1.1 + US$35**
**Incluye gastos administrativos de 10% y otros derechos de emisión		
Además de acumular un interés semanal de:	**Interés semanal** **S/ Interes_semanal**	

Le recordamos que **le conviene pagar inmediatamente** para evitar costos mayores. Use nuestros siguientes canales de pago:

Si quiere pagar y no puede, llámenos o escribanos para evaluar las opciones de pago:

Whats App
962 727 311 / 940 396 206 / 940 385 948

servicios_rentas@munijesusmaria.gob.pe

Figure OF.6: Information letter template, priority group G3, Q1

Municipality of
Jesús María

TAX AND REVENUE ADMINISTRATION OFFICE

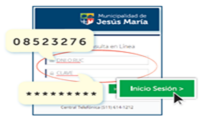
Jesús María, DATE

Notice of Pending Debt

Dear taxpayer **Name**

We remind you that you have the following debt outstanding with the municipality*:		**Debt Amount**: **S/. Amount_Debt**
*By concept of:	Q1 Property tax Q1 Property tax and User charges	
And that your debt **can be transferred at any time and without prior notice to the priority collection group** (which will imply the start of the coercive collection process in a maximum of 12 weeks).		
If the coercive collection process is started your debt will include the penalties and administrative expenses regulated by law and will amount to**:		**Debt Amount with Additional Expenses: S/.Amount_Debt*1.1 + US$35**
**Includes administrative expenses of 10% and other debt issuance rights		
In addition to accruing a weekly interest of:	**Weekly Interest** **S/ Weekly_interest**	

We remind you that **it is on your own interest to pay immediately** to avoid higher expenses. You can use any of the payment options listed below:

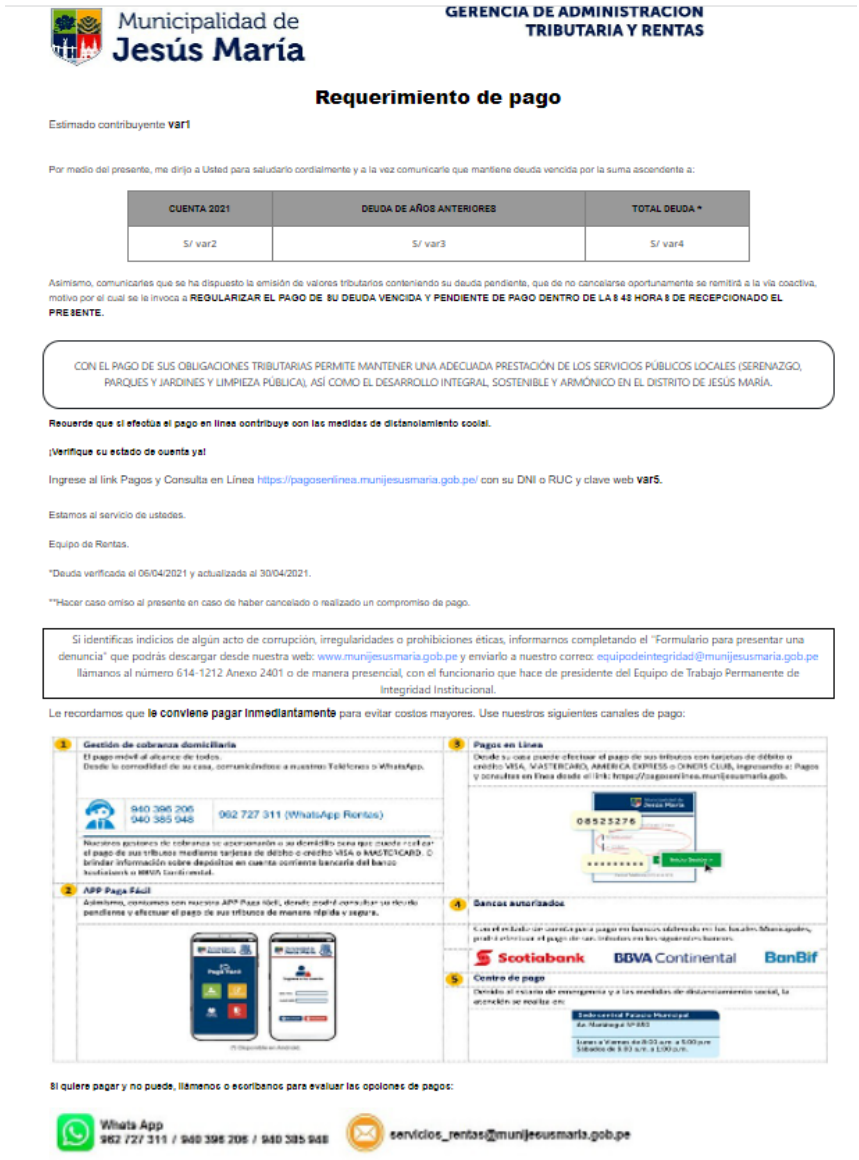
1	**Home collection** Mobile payment available to everyone. From the comfort of your home, contact our phones or WhatsApp. 940 396 206 940 385 948 962 727 311 (Whatsapp Rentas) Our collection managers will come to your home so that you can pay your taxes using VISA or Mastercard debit or credit cards. Or provide information regarding deposits in a Scotiabank or BBVA Continental bank checking account.	3	**Online payments** From home, you can pay your taxes with Visa, Mastercard, American Express or Diners Club debit or credit cards, by going to: "Online payments and inquiries" from the link: https://pagosenlinea.munijesusmaria.gob 
2	**App "Easy Pay"** Likewise, we have our Easy Pay App, where you can check your pending debt and pay your taxes quickly and safely.  (*) Available on Android	4	**Authorized banks** With the bank payment account statement obtained at municipal premises, you can pay your taxes at the following banks: Scotiabank BBVA Continental BanBif
		5	**Payment center** Due to the state of emergency and social distancing measures, attention is provided at: **Municipal Palace Headquarters** Av. Mariátegui N.850 Monday to Friday from 8AM to 5PM Saturday from 9AM to 1PM

If you want to pay and cannot, call or write to us to evaluate payment options:

Whats App
962 727 311 / 940 396 206 / 940 385 948

servicios_rentas@munijesusmaria.gob.pe

Figure OF.7: Information letter template, priority group G3, Q1 - English translation



Municipalidad de Jesús María

GERENCIA DE ADMINISTRACION TRIBUTARIA Y RENTAS

Requerimiento de pago

Estimado contribuyente **var1**

Por medio del presente, me dirijo a Usted para saludarlo cordialmente y a la vez comunicarle que mantiene deuda vencida por la suma ascendente a:

CUENTA 2021	DEUDA DE AÑOS ANTERIORES	TOTAL DEUDA *
S/ var2	S/ var3	S/ var4

Asimismo, comunicarles que se ha dispuesto la emisión de valores tributarios conteniendo su deuda pendiente, que de no cancelarse oportunamente se remitirá a la vía coactiva, motivo por el cual se le invoca a **REGULARIZAR EL PAGO DE SU DEUDA VENCIDA Y PENDIENTE DE PAGO DENTRO DE LA 8 48 HORA 8 DE RECEPCIONADO EL PRE 8ENTE.**

CON EL PAGO DE SUS OBLIGACIONES TRIBUTARIAS PERMITE MANTENER UNA ADECUADA PRESTACIÓN DE LOS SERVICIOS PÚBLICOS LOCALES (SERENAZGO, PARQUES Y JARDINES Y LIMPIEZA PÚBLICA), ASÍ COMO EL DESARROLLO INTEGRAL, SOSTENIBLE Y ARMÓNICO EN EL DISTRITO DE JESÚS MARÍA.

Recuerde que si efectúa el pago en línea contribuye con las medidas de distanciamiento social.

¡Verifique su estado de cuenta ya!

Ingrese al link Pagos y Consulta en Línea https://pagoenlinea.munijesusmaria.gob.pe/ con su DNI o RUC y clave web **var5.**

Estamos al servicio de ustedes.

Equipo de Rentas.

*Deuda verificada el 06/04/2021 y actualizada al 30/04/2021.

**Hacer caso omiso al presente en caso de haber cancelado o realizado un compromiso de pago.

Si identificas indicios de algún acto de corrupción, irregularidades o prohibiciones éticas, informarnos completando el "Formulario para presentar una denuncia" que podrás descargar desde nuestra web: www.munijesusmaria.gob.pe y enviarlo a nuestro correo: equipodeintegridad@munijesusmaria.gob.pe llámanos al número 614-1212 Anexo 2401 o de manera presencial, con el funcionario que hace de presidente del Equipo de Trabajo Permanente de Integridad Institucional.

Le recordamos que **le conviene pagar inmediantamente** para evitar costos mayores. Use nuestros siguientes canales de pago:

1 Gestión de cobranza domiciliaria

El pago móvil al alcance de todos.
Desde la comodidad de su casa, comunicándose a nuestros Teléfonos o WhatsApp.

940 396 206
940 385 948
962 727 311 (WhatsApp Rentas)

Nuestros gestores de cobranza se apersonarán a su domicilio para que cuente con el pago de sus tributos mediante tarjetas de débito o crédito VISA o MASTERCARD. O brindar información sobre depósitos en cuenta corriente bancaria del banco scotiabank o BBVA Continental.

2 APP Paga Fácil

Asimismo, contamos con nuestra APP Paga fácil, donde podrá consultar su deuda pendiente y efectuar el pago de sus tributos de manera rápida y segura.

3 Pagos en Línea

Desde su casa puede efectuar el pago de sus tributos con tarjetas de débito o crédito VISA, MASTERCARD, AMERICA EXPRESS o DINERS CLUB, ingresando a: Pagos y consultas en línea desde el link: https://pagoenlinea.munijesusmaria.gob.

08523276

4 Bancos autorizados

Con el código de cuenta para pago en bancos obtenido en las locales Municipales, podrá efectuar el pago de sus tributos en los siguientes bancos:

Scotiabank BBVA Continental BanBif

5 Centro de pago

Debido al estado de emergencia y a las medidas de distanciamiento social, la atención se realiza en:

Sede central Palacio Municipal
Av. Nicolás de Piérola N° 1351

Lunes a Viernes de 8:00 a.m. a 5:00 p.m
Sábados de 8:00 a.m. a 1:00 p.m.

Si quiere pagar y no puede, llámenos o escríbanos para evaluar las opciones de pagos:

Whats App
962 727 311 / 940 396 206 / 940 385 948

servicios_rentas@munijesusmaria.gob.pe

Figure OF.8: Information letter template, control group

Municipality of
Jesús María

TAX AND REVENUE ADMINISTRATION OFFICE

Payment Requirement

Mr. taxpayer **Name**

I am hereby writing to you to inform you that you have overdue debt for the ascending amount

Debt 2021	Debt previous years	Total Debt
Amount current year	**Amount previous years**	**Total Amount**

Likewise, to inform you that the issuance of the legal notification comprising your pending debt has been arranged, which if not paid in a timely manner will trigger the start of the coercive collection process, which is why you are invoked to **REGULARIZE THE PAYMENT OF YOUR OVERDUE AND PENDING DEBT WITHIN 48 HOURS OF RECEIVING THE PRESENT.**

WITH THE PAYMENT OF YOUR TAX OBLIGATIONS, YOU ALLOW TO MAINTAIN ADEQUATE PROVISION OF LOCAL PUBLIC SERVICES (SAFETY, PARKS AND GARDENS, AND PUBLIC CLEANING), AS WELL AS THE INTEGRAL, SUSTAINABLE AND HARMONIOUS DEVELOPMENT IN THE DISTRICT OF JESUS MARIA.

Remember that paying online contributes to social distancing.

Check your account status now!

Enter the link Online payments and consultations https://pagosenlinea.munijesusmaria.gob with your DNI or RUC and web code **code**.

We are at your service.
Revenue Team.

If you identify signs of any act of corruption, irregularities or ethical prohibitions, inform us by completing the "Form to file a complaint" that you can download from our website www.munijesusmaria.gob.pe and send it to our email equipodeintegridad@munijesusmaria.gob.pe, call us at number 614-1212 Anexo 2401, or in person, with the official who acts as President of the Institutional Integrity Task Force.

We remind you that **it is on your own interest to pay immediately** to avoid higher expenses. You can use any of the payment options listed below:

1 Home collection

Mobile payment available to everyone.
From the comfort of your home, contact our phones or WhatsApp.

940 360 206
940 385 948

962 727 311 (Whatsapp Revenues)

Our collection managers will come to your home so that you can pay your taxes using VISA or Mastercard debit or credit cards. Or provide information regarding deposits in a Scotiabank or BBVA Continental bank checking account.

2 App "Easy Pay"

Likewise, we have our Easy Pay App, where you can check your pending debt and pay your taxes quickly and safely.

(*) Available on Android

3 Online payments

From home, you can pay your taxes with Visa, Mastercard, American Express or Diners Club debit or credit cards, by going to: "Online payments and inquiries" from the link: https://pagosenlinea.munijesusmaria.gob

4 Authorized banks

With the bank payment account statement obtained at municipal premises, you can pay your taxes at the following banks:

Scotiabank BBVA Continental BanBif

5 Payment center

Due to the state of emergency and social distancing measures, attention is provided at:

Municipal Palace Headquarters
Av. Mariátegui N.850
Monday to Friday from 8AM to 5PM Saturday from 9AM to 1PM

If you want to pay and cannot, call or write to us to evaluate payment options:

Whats App
962 727 311 / 940 396 206 / 940 385 948

servicios_rentas@munijesusmaria.gob.pe

Figure OF.9: Information letter template, control group - English translation

Municipalidad de Jesús María

Gerencia de Administración Tributaria y Rentas
SubGerencia de Recaudación Tributaria y Ejecutoría Coactiva

ORDEN DE PAGO N° 014483-2020-MDJM-SGRTEC

Lote: 2020-0122
Fecha: 22/12/2020

IDENTIFICACION DEL DEUDOR TRIBUTARIO:
Nombre o Razón social:
Documento de Identidad:
Domicilio Fiscal:

Tributo: IMPUESTO PREDIAL

Se le requiere la cancelación de la deuda contenida en el presente documento, bajo apercibimiento de iniciar el procedimiento de ejecució n coactiva.
La presente se emite por los tributos y periodos que se indican, cuyo monto se ha actualizado al 30/12/2020, luego de esta fecha se actualizar á con una tasa diaria de 0.04%, conforme a la tasa de interés moratorio fijada.

Motivo Determinante: Se ha verificado la existencia de una deuda tributaria no cancelada dentro de los plazos establecidos
Declaración Jurada: Actualización 2016 de DJ N°0016040239 de fecha 2020-08-29
Actualización 2017 de DJ N°0017041683 de fecha 2020-08-29
Actualización 2018 de DJ N°0018044121 de fecha 2020-08-29
Actualización 2019 de DJ N°0019046083 de fecha 2020-08-29

Año	Base Imponible	Tramos	Alicuota	Insolutos	Imp. Anual	Trim. acotados:	Insoluto	Reajuste(1)	Interes(2)	Total
2016		Hasta 15 UIT Mas de 15 UIT a 60UIT Mas de 60 UIT	0.20% 0.60% 1.00%			01 02 03 04		0.00		
2017		Hasta 15 UIT Mas de 15 UIT a 60UIT Mas de 60 UIT	0.20% 0.60% 1.00%			01 02 03 04		0.00		
2018		Hasta 15 UIT Mas de 15 UIT a 60UIT Mas de 60 UIT	0.20% 0.60% 1.00%			01 02 03 04		0.00		
2019		Hasta 15 UIT Mas de 15 UIT a 60UIT Mas de 60 UIT	0.20% 0.60% 1.00%			01 02 03 04		0.00		

Gastos de Emisión de la Cuponera:	
Total Deuda General:	

UIT: AÑO 2016 = S/3950.00,AÑO 2017 = S/4050.00,AÑO 2018 = S/4150.00,AÑO 2019 = S/4200.00

(1) Factores de Reajuste: 2016-01=0.0000,2016-02=0.0000,2016-03=0.0000,2016-04=0.0000,2017-01=0.0000,2017-02=0.0000,2017-03=0.0000,2017-04=0.0000,2018-01=0.0000,2018-02=0.0000,2018-03=0.0000,2018-04=0.0000,2019-01=0.0000,2019-02=0.0000,2019-03=0.0000,2019-04= 0.0000

(2) TIM Aplicada: 2016-01=64.96%,2016-02=61.91%,2016-03=58.84%,2016-04=55.80%,2017-01=52.23%,2017-02=49.73%,2017-03=46.67%,2017-04=43.63%,2018-01=39.95%,2018-02=37.56%,2018-03=34.07%,2018-04=30.45%,2019-01=26.23%,2019-02=26.23%,2019-03=26.23%,2019-04=26.24%

BASE LEGAL:
Art. 33°, 78° inc. 1 y 104° del TUO del Codigo Tributario aprobado por D.S. N° 133-2013-EF y sus modificatorias
Art. 8° y siguientes del TUO de la Ley de Tributacion Municipal aprobado por D.S. 156-04-EF y sus modificatorias
Redondeo: Novena Disposición Final del TUO del Codigo Tributario D.S. 133-2013
Ordenanza N° 551 -MDJM; que aprueban la TIM para el distrito de Jesús María.

MUNICIPALIDAD DISTRITAL DE JESUS MARIA
GERENCIA DE ADMINISTRACION TRIBUTARIA Y EJECUTORIA COACTIVA
Abog.

Ordenanza No. 476-MDJM, que regula el monto de la tasa por concepto de la emisión mecanizada del Impuesto Predial y los Arbitrios Municipales para el ejercicio 2016., Ordenanza No. 510-MDJM, que regula el monto del derecho de emision mecanizada de actualización de Valores, determinación del tributo y distribución domiciliaria del Impuesto Predial y Arbitrios Municipales del ejercicio 2017., Ordenanza N°538-MDJM, que prórroga para el ejercicio 2018, la vigencia de la ordenanza N° 510 que establece el monto de derecho de emisión mecanizada de actualización de valores, determinación y distribución del Impuesto Predial y Arbitrios Municipales, Ordenanza N°554-MDJM, que prórroga para el ejercicio 2019, la vigencia de la ordenanza N° 510 que establece el monto de derecho de emisión mecanizada de actualización de valores, determinación y distribución del Impuesto Predial y Arbitrios Municipales

NOTA:

- Si a la recepción de esta, usted ya realizó el pago de tales conceptos, le rogamos no prestar atención a la presente.
- De no estar conforme, podrá interponer recurso de reclamación debidamente sustentado, para la cual deberá acreditar la cancelación de la totalidad de la deuda,salvo sea evidente la improcedencia de la cobranza.
- Cualquier consulta, los esperamos en la SubGerencia de Recaudación Tributaria y Ejecutoría Coactiva en el Palacio Municipal. Tlf. 940396206 , 940385948 o al WhatsApp Tributario 962-727311

Figure OF.10: Notification (Valor), treatment and control groups

Municipality of
Jesús María

Lot:
Date:

PAY ORDER N° -MDJM-SGRTEC

IDENTIFICATION OF THE TAX DEBTOR:
Name:
ID:
Fiscal Address:
Tax: PROPERTY TAX

You are required to cancel the debt contained in this document, under warning of initiating the coercive execution procedure.

This is issued for the taxes and periods indicated, the amount of which has been updated as of DATE, after this date it will be updated with a daily rate of 0.04%, in accordance with the default interest rate set.

Determinant Reason: The existence of a tax debt not paid within the established deadlines has already been verified

Sworn Declaration: Year Update of DJ N°Number from Date

Year	Tax base	Tranches	Rate	Unpaid amount	Annual tax	Quarters	Unpaid amount	Readjust. (1)	Interest (2)	Total
year	amount	Up to 15 UIT Between 15 and 60 UIT More than 60 UIT	0.20% 0.60% 1.00%	amount	amount	01 02 03 04	amount	amount	amount	amount
year	amount	Up to 15 UIT Between 15 and 60 UIT More than 60 UIT	0.20% 0.60% 1.00%	amount	amount	01 02 03 04	amount	amount	amount	amount
year	amount	Up to 15 UIT Between 15 and 60 UIT More than 60 UIT	0.20% 0.60% 1.00%	amount	amount	01 02 03 04	amount	amount	amount	amount
year	amount	Up to 15 UIT Between 15 and 60 UIT More than 60 UIT	0.20% 0.60% 1.00%	amount	amount	01 02 03 04	amount	amount	amount	amount

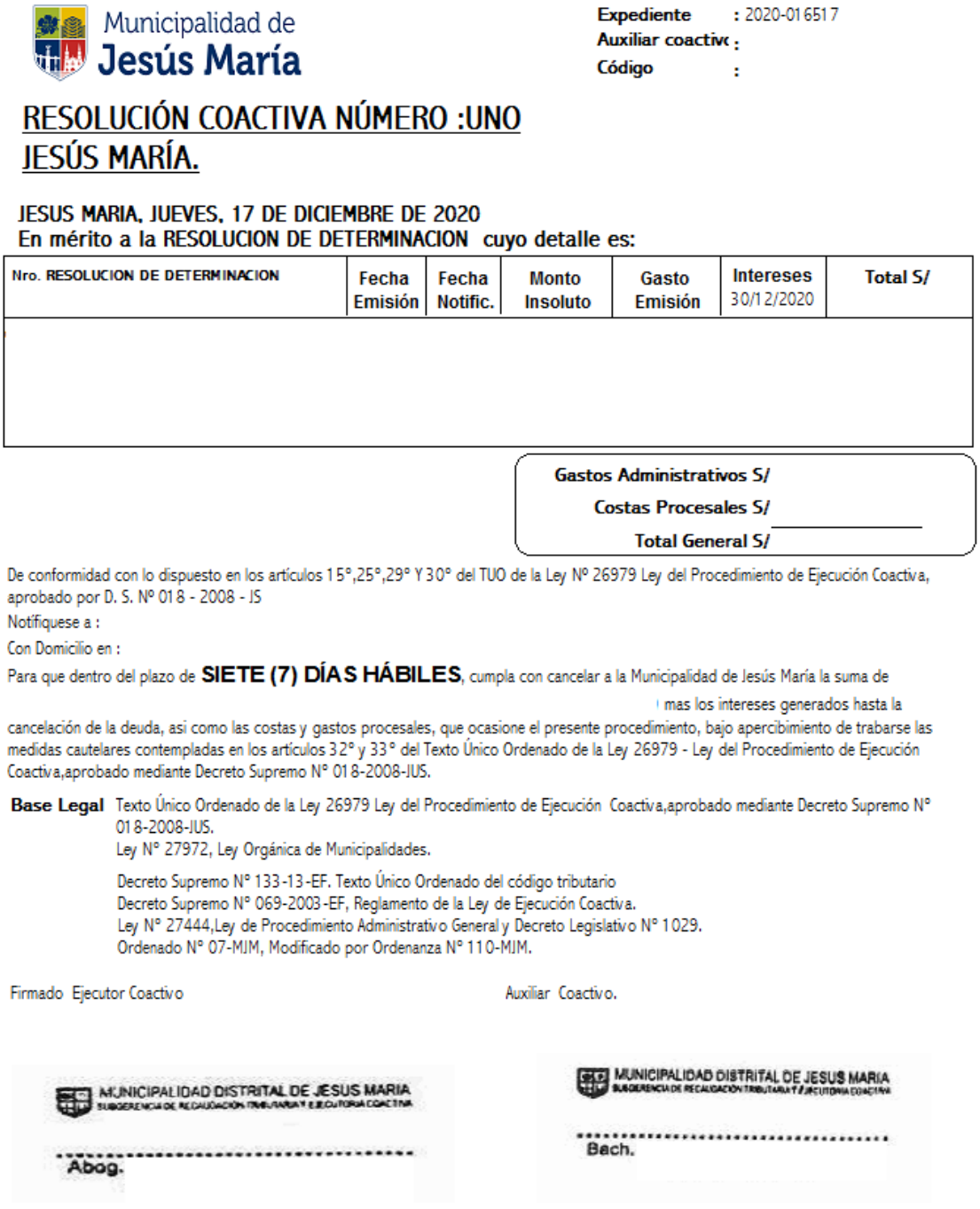
Gastos de Emisión de la Cuponera: 25.38
Total Deuda General: Amount

UIT: YEAR 2016=S/3950.00, YEAR 2017=S/4050.00, YEAR 2018=S/4150.00, YEAR 2019=S/4200.00
(1) Readjustment factors: 2016-01=0.0000, 2016-02=0.0000, 2016-03=0.0000, 2016-04=0.0000, 2017-01=0.0000, 2017-02=0.0000, 2017-03=0.0000, 2017-04=0.0000, 2018-01=0.0000, 2018-02=0.0000, 2018-03=0.0000, 2018-04=0.0000, 2019-01=0.0000, 2019-02=0.0000, 2019-03=0.0000, 2019-04=0.0000
(2) Default interest rate applied: 2016-01=64.96%, 2016-02=61.91%, 2016-03=58.84%, 2016-04=55.80%, 2017-01=52.23%, 2017-02=49.73%, 2017-03=46.67%, 2017-04=43.63%, 2018-01=39.95%, 2018-02=37.56%, 2018-03=34.07%, 2018-04=30.45%, 2019-01=26.23%, 2019-02=26.23%, 2019-03=26.23%, 2019-04=26.24%

LEGAL BASE:
Art. 33°, 78° inc. 1 and 104° of the TUO of the Tax Code approved by D.S. N°133-2013-EF and its amendments
Art. 8 and following of the TUO of the Municipal Taxation Law approved by D.S. 156-04-EF and its amendments
Rounding: Ninth Final Provision of the TUO of the D.S. Tax Code. 133-2013
Ordinance No. 551-MDJM; that approve the TIM for the district of Jesús María.
Ordinance No. 476-MDJM, which regulates the amount of the fee for the mechanized issuance of the Property Tax and Municipal Excise Taxes for the fiscal year 2016., Ordinance No. 510-MDJM, which regulates the amount of the mechanized emission right of update of Values, determination of the tax and home distribution of the Property Tax and Municipal Excise Taxes for the year 2017., Ordinance No. 538-MDJM, which extends for the year 2018, the validity of the ordinance No. 510 that establishes the amount of the issuance right mechanized updating of values, determination and distribution of the Property Tax and Municipal Excise Taxes, Ordinance No. 554-MDJM, which extends for the year 2019, the validity of ordinance No. 510 that establishes the amount of the right to mechanized issuance of updating of values , determination and distribution of Property Tax and Municipal Excise Taxes

NOTE:
- If upon receipt of this, you have already made payment for such concepts, we ask you not to pay attention to this.
- If you are not satisfied, you may file a duly supported claim, for which you must prove the cancellation of the entire debt, unless the inadmissibility of collection is evident.
- If you have any questions, we are waiting for you at the Tax Collection and Coercive Execution Office in the Municipal Palace. Tel. 940396206, 940385948 or WhatsApp Tax 962-727311

Figure OF.11: Notification (Valor), treatment and control groups - English translation



Municipalidad de
Jesús María

Expediente : 2020-016517
Auxiliar coactivo :
Código :

RESOLUCIÓN COACTIVA NÚMERO :UNO
JESÚS MARÍA.

JESUS MARIA, JUEVES, 17 DE DICIEMBRE DE 2020
En mérito a la RESOLUCION DE DETERMINACION cuyo detalle es:

Nro. RESOLUCION DE DETERMINACION	Fecha Emisión	Fecha Notific.	Monto Insoluto	Gasto Emisión	Intereses 30/12/2020	Total S/

Gastos Administrativos S/
Costas Procesales S/
Total General S/

De conformidad con lo dispuesto en los artículos 15°,25°,29° Y 30° del TUO de la Ley Nº 26979 Ley del Procedimiento de Ejecución Coactiva, aprobado por D. S. Nº 018 - 2008 - JS

Notifiquese a :

Con Domicilio en :

Para que dentro del plazo de **SIETE (7) DÍAS HÁBILES**, cumpla con cancelar a la Municipalidad de Jesús María la suma de mas los intereses generados hasta la cancelación de la deuda, así como las costas y gastos procesales, que ocasione el presente procedimiento, bajo apercibimiento de trabarse las medidas cautelares contempladas en los artículos 32° y 33° del Texto Único Ordenado de la Ley 26979 - Ley del Procedimiento de Ejecución Coactiva,aprobado mediante Decreto Supremo N° 018-2008-JUS.

Base Legal Texto Único Ordenado de la Ley 26979 Ley del Procedimiento de Ejecución Coactiva,aprobado mediante Decreto Supremo N° 018-2008-JUS.
Ley N° 27972, Ley Orgánica de Municipalidades.

Decreto Supremo N° 133-13-EF. Texto Único Ordenado del código tributario
Decreto Supremo N° 069-2003-EF, Reglamento de la Ley de Ejecución Coactiva.
Ley N° 27444,Ley de Procedimiento Administrativo General y Decreto Legislativo N° 1029.
Ordenado N° 07-MJM, Modificado por Ordenanza N° 110-MJM.

Firmado Ejecutor Coactivo

Auxiliar Coactivo.

MUNICIPALIDAD DISTRITAL DE JESUS MARIA
SUBGERENCIA DE RECAUDACIÓN TRIBUTARIA Y EJECUTORIA COACTIVA

Abog.

MUNICIPALIDAD DISTRITAL DE JESUS MARIA
SUBGERENCIA DE RECAUDACIÓN TRIBUTARIA Y EJECUTORIA COACTIVA

Bach.

Figure OF.12: Writ (REC1), treatment and control groups

Municipality of
Jesús María

Record No.:
Coercive aux staff:
Code:

COERCIVE RESOLUTION NUMBER: ONE
JESUS MARIA.

JESUS MARIA. DATE
In merit of the DETERMINATION RESOLUTION, the detail of which is:

Nbr. DETERMINATION RESOLUTION	Issue Date	Notific. Date	Unpaid Amount	Issue Expense	Interest Date	Total S/
050869 2019 2018: FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT,...	Date	Date	Amount		Amount	Amount

Administrative expenses S/	**Amount**
Court costs S/	**Amount**
Total General S/	**Amount**

In accordance with the provisions of articles 15, 25, 29 and 30 of the TUO of Law No. 26979 Law of the Coercive Execution Procedure. approved by D.S. N° 01 8 - 2008 – JS

Notify: **NAME**

With address at: **ADDRESS**

So that within the period of **SEVEN (7) BUSINESS DAYS**, you comply with paying the Municipality of Jesús María the sum of **S/Amount (AMOUNT IN LETTERS)** plus the interest generated until the debt is paid, as well as the costs and procedural expenses caused by this procedure, under warning of blocking the precautionary measures contemplated in articles 32 and 33 of the Single Ordered Text of Law 26979 - Law of the Coercive Execution Procedure, approved by Supreme Decree N°01 8-2008-JUS.

Legal Base Single Ordered Text of Law 26979 Law of the Coercive Execution Procedure, approved by Supreme Decree No. 01 8-2008-JUS.
Law No. 27972, Organic Law of Municipalities.

Supreme Decree No. 133-13-EF. Single Ordered Text of the tax code
Supreme Decree N°069-2003-EF, Regulation of the Coercive Execution Law.
Law No. 27444, General Administrative Procedure Law and Legislative Decree No. 1029.
Ordered No. 07-M.IM, Modified by Ordinance No. 11 0-M1M.

Signed Coercive Excecutor

Coercive Auxiliary

Figure OF.13: Writ (REC1), treatment and control groups - English translation

We note that although similar, the letters across treatment and control groups are not identical, and it is possible that small differences across letters contribute to the measured effect of treatment. This concern is alleviated by the fact that all subsequent communication (.e.g. the legal writ) was identical across treatment and control groups. In addition, the effect of receiving a G3 notification, instead of being in the control group is small and negative. This suggests that the impact of priority group G1 was driven by the substance of enforcement promises, rather than formatting differences.

References

Chassang, S., L. Del Carpio, and S. Kapon (2020): "Using Divide and Conquer to Improve Tax Collection: Theory and Laboratory Evidence," Working Paper 28042, National Bureau of Economic Research.

Chen, D. L., M. Schonger, and C. Wickens (2016): "oTree—An open-source platform for laboratory, online, and field experiments," *Journal of Behavioral and Experimental Finance*, 9, 88–97.

Gneezy, U. and A. Rustichini (2000): "A fine is a price," *The journal of legal studies*, 29, 1–17.