

No shame in my name: Public disclosure and tax compliance in a low-capacity state

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Abstract

Public disclosure of tax behavior is a potentially promising policy tool for raising tax compliance in low-capacity states. Through two cross-randomized experiments involving 70,000 taxpayers in Kampala, Uganda, we study effects of reporting delinquents and recognizing compliers. In doing so, we provide evidence on the social dimensions of tax morale. The threat of publicly disclosing delinquency raises compliance by 17%, but subsequently disseminating delinquent behavior lowers compliance of others by 21%. Public recognition backfires, lowering compliance both for those promised recognition (16%) and for those who receive information about compliant taxpayers (19%). Symmetric reporting and recognition results are consistent with a model in which being publicly known as a rental property owner is costly, but social sanctions for delinquency are limited. This is corroborated by interviews with tax-liable property owners. Further, disseminating information causes beliefs to be updated down toward the true compliance rate, suggesting a likely channel through which information dissemination lowers compliance. Overall, these policies are limited at raising revenue in a low-capacity context.

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1 Introduction

Raising tax revenue is a challenge in many low-income countries where, despite widening tax nets, collection rates remain low and means of enforcement are limited (Besley & Persson 2014). For instance, only around 10% of liable properties pay their annual property tax in many sub-Saharan African cities (Okunogbe 2019, Bergeron et al. 2019, Cogneau et al. 2020, Ahabwe et al. 2020, Sandholtz & Vicente 2024, Collin et al. 2021). In contexts with limited state capacity, there is interest in policies that aim to raise ‘voluntary’ compliance through channels of tax morale (Luttmer & Singhal 2014).

Publicly disclosing the tax behavior of individuals is one common policy tool that aims to leverage social image to raise tax compliance.¹ These policies involve publicizing information on the payment behavior of individual taxpayers in the form of shaming tax delinquents, recognizing tax compliers, or indiscriminately publishing taxpayer behavior (Nakayama 2021). The ability to implement such programs with limited administrative capacity makes them particularly appealing to governments in low-income countries.

There are at least three potential mechanisms through which public disclosure could encourage payment. First, through shame in delinquency or pride in compliance status. For instance, the threat of disclosing delinquents could have a positive impact on tax payment if individuals are ashamed to appear as renegeing on their social obligations (Benabou & Tirole 2011).² Second, by implicitly disclosing an individual’s status as tax liable. Property tax eligibility signals asset ownership and wealth and, if such a signal imposes a social cost (e.g., through informal or ‘kin’ taxes (Jakiela & Ozier 2015, Baland et al. 2011)), then disclosing delinquents raises the cost of delinquency while recognizing compliers raises the cost of compliance.³ Third, public disclosure may indirectly influence the taxpayers to whom the information is disclosed. Depending on prior beliefs, information about others’ tax behavior can have an effect on one’s tax morale and therefore their decision to comply (Del Carpio 2022, Nathan et al. 2024).

While there is a long literature on public disclosure policies in developed countries (Perez-Truglia & Troiano 2018, Reck et al. 2022, Bø et al. 2015, Hasegawa et al. 2013, Angaretis et al. 2022, Lenter & Slemrod 2003, Alm et al. 2017, Dwenger & Treber 2022), there is less evidence on *how* such policies work and their replicability in low-income countries where, among other things, low rates of compliance may shape norms around tax evasion (Traxler 2010, Besley et al. 2022). As such, it is important to ask: what are the effects of public disclosure policies on tax compliance in a low-income setting,

¹The OECD (2017) cites disclosure as the fourth most used instrument of tax debt enforcement behind: obtaining a lien over assets; initiating bankruptcy or liquidation; and imposing a liability on company directors for company tax debts, and ahead of: temporarily closing a business or withdrawing a license; denying access to government services; and imposing restrictions on international travel.

²Equivalently, recognizing compliers could have a positive effect on payment if there is esteem or social merit obtained from being known by others as having paid taxes.

³Opposing effects could exist if there is a social gain to signaling wealth (Glazer & Konrad 1996).

and how do these compare to alternative policies? Further, what can we learn about the social dimensions of tax morale that drive effects - do taxpayers feel social pressure to pay their taxes? And how do beliefs about others' compliance affect motivations to pay?

To answer these questions, we study the impact of publicly disclosing property tax behavior in the city of Kampala where incomes are low, baseline tax compliance is minimal, and administrative capacity is relatively weak. In Kampala, owners of rental properties are subject to a tax on their assessed annual property income. We work with the Kampala Capital City Authority (KCCA) to design two cross-randomized, multi-armed field experiments with roughly 70,000 tax-liable property owners to test the effects of delinquent reporting and complier recognition policies on tax payments. We model the social determinants of tax evasion and use this structure to interpret our estimates of treatment effects, and determine the empirical relevance of different mechanisms. Finally, we conduct surveys at baseline and endline as well as a follow-up qualitative survey to provide direct evidence on taxpayer sentiments and beliefs and strengthen our understanding of the mechanisms.

Our experiment was designed with two broad aims. First, to separately identify the effect of warning taxpayers that their behavior will be publicly disclosed (direct effects) from the effect of publicly disseminating this information on the tax behavior of recipients (indirect effects). To do so, we implement our experiment across two waves (June 2020 and December 2020) and cross-randomize our treatments, so that the direct effects are tested in the first wave, and indirect effects are tested in the second wave. Our second aim is to estimate the effects of publicly reporting delinquent taxpayers separately from the effects of publicly recognizing compliant taxpayers. To do so, we compare randomly assigned public disclosure sub-treatments that can be either positive or negatively framed. In wave one, taxpayers can be informed that their delinquency will be reported or their compliance recognized. In addition, we compare these treatments with different types of text message nudges from the literature (e.g., Brockmeyer et al. 2023, Cohen 2020, Mascagni & Nell 2022, De Neve et al. 2021, Collin et al. 2021, Okunogbe 2019). In wave two, taxpayers can receive reports of delinquents or compliers. In all cases, treatments are administered by text message: wave one treatment messages inform taxpayers whether they will be disclosed for delinquency or for compliance; and wave two treatment messages contain information about past delinquents or past compliers.

To explore mechanisms underlying the direct effects of public disclosure, we outline a model of tax evasion in the style of the canonical Allingham & Sandmo (1972), formalizing mechanisms as social payoffs following Bursztyn & Jensen (2017). Public disclosure policies can change the probability that peers believe an individual to be in tax compliant as well as the probability that peers believe an individual to own property. We apply this structure to help interpret our empirical estimates.

We conduct surveys with taxpayers at baseline and endline, as well as follow-up

interviews, to complement administrative data on tax payments. The baseline survey provides us with a broad set of descriptive statistics for a sample of taxpayers, whilst in the endline survey, we focus on a narrow set of beliefs for an expanded set of taxpayers. The latter allows us to estimate treatment effects on outcomes such as beliefs about compliance rates of different peer groups. Our follow-up interviews give further detail on perceived social image payoffs from a smaller sample of taxpayers.

There are five key takeaways from our study that together shed light on the social determinants of tax compliance and provide a policy-relevant basis for understanding the effects of public disclosure on tax payments in low-capacity, low-compliance settings.

First, we find evidence of both direct and indirect effects of publicly reporting tax delinquents (the ‘stick’). Our estimates of the direct effects are positive; taxpayers are 17% more likely to comply when they are warned that they will be disclosed as delinquents if they do not pay.⁴ Our estimates of the indirect effects are negative; taxpayers are 21% less likely to comply when they receive reports of delinquents. This demonstrates an important unintended consequence of public disclosure policies: that the dissemination of tax behavior may lower morale more generally.

Second, we find evidence of both direct and indirect effects of publicly recognizing compliers (the ‘carrot’). However, the effects differ substantially from those found when publicly reporting delinquents. Our estimates of the direct effects of recognizing compliers are negative; taxpayers are 16% less likely to comply when they are promised that they will be honored as compliers if they pay. Our estimates of the indirect effects are also negative; taxpayers are 19% less likely to comply when they receive lists of compliant taxpayers. Together, these suggest that publicly recognizing taxpayers actually backfires.

Third, we interpret these empirical estimates of the direct effects of reporting and recognition within the structure of our model to disentangle likely mechanisms. Our estimates of direct effects can be rationalized in the framework of our model only if there is both a privacy cost of being revealed as tax liable and no shame or pride in tax payment behavior. In other words, the mechanism that explains the direct effects of public disclosure policy is that of individuals incurring a cost from becoming revealed as a rental property owner – shame in tax delinquency plays no role. Qualitative evidence from our follow up survey strengthens this interpretation. Respondents perceive a variety of financial and material costs to having their ownership of rental properties publicly known.

Fourth, we provide evidence on the mechanisms through which both reporting and recognition policies induce negative indirect effects. We estimate treatment effects of disseminating lists of compliers and of delinquents on a range of taxpayer beliefs and sentiments in our endline survey. We find significant treatment effects on taxpayers

⁴This estimate is very similar in magnitude to the 21% increase of payment probability found in a field experiment shaming tax delinquents in the USA (Perez-Truglia & Troiano 2018).

beliefs of the compliance rate overall and of the wealthy in particular.⁵ Both treatments *lower* taxpayers' beliefs about the city wide compliance rate by 3-4% and the compliance rate of the wealthy by 6-7%. This is consistent with baseline survey evidence where respondents over-predict the general compliance rate, and so are likely to update beliefs downwards when shocked with information on actual compliers and delinquents. These deteriorated beliefs cause taxpayers to reduce their payment propensity.

Fifth, in benchmarking public disclosure policies we find that simple reminders of the different legal penalty measures that the government can take against delinquents are a relatively effective alternative means of raising compliance in this context. These types of messages are twice as effective as direct messages warning of public reporting, and without their negative indirect consequences.

This paper contributes to a broad literature on how social image affects economic behavior (Bursztyn & Jensen 2017, Butera et al. 2022, Bursztyn et al. 2019). In the tax context, studies have looked at reduced form effects of reporting (Perez-Truglia & Troiano 2018) and recognition (Slemrod et al. 2022). By studying both reporting and recognition policies in the same experimental context, we isolate social image effects of shame in tax delinquency and pride in compliance from the effects of being disclosed as tax liable in general. In particular, we demonstrate that the social pressure to pay taxes is weak and, instead, the reduced form effect of public disclosure is driven by publicity of wealth. As discussed in Section 7.2.2 on external validity, weak compliance norms may exist in similar contexts that have low baseline compliance and poor relationships between citizens and state.

By identifying (a lack of) shame in tax delinquency, we also contribute to a parallel literature on 'tax morale' (Luttmer & Singhal 2014, Prichard 2022, Hallsworth et al. 2017). We further contribute to this literature by providing evidence that beliefs of others' tax compliance positively affects ones own decision to comply. While this was considered in Del Carpio (2022), the results were statistically indistinguishable from standard reminders. In our setting, we demonstrate that such beliefs are the likely channel through which the indirect effects of public disclosure affect compliance.⁶

We also contribute to the literature on the effectiveness of public disclosure policies for raising tax compliance. By conducting a large scale field experiment, we are able identify indirect effects that lead to unintended consequences. This extends previous work that either looks at direct effects alone (Angaretis et al. 2022, Dwenger & Treber 2022) or estimates a combination of the two effects (Bø et al. 2015, Hasegawa et al. 2013). While there have been some efforts to separately estimate indirect effects, these have largely been through lab experiments (Blaufus et al. 2017, Wenzel 2005). As far as we know, our

⁵We find no statistically significant effect on alternative beliefs about the compliance rate of immediate neighbours, state detection capacity, or state benevolence.

⁶Contemporaneously to our study, Nathan et al. (2024) have found similarly that property tax payers in the USA are more likely to pay when they perceive that others pay as well.

study is the first to use experimental variation in the field to separately identify these indirect effects on a large population of information recipients. On net, we find that these indirect effects of disclosing tax delinquents cancels out the direct effect compliance gains. Further, we show that public recognition programs can have a negative direct effect, extending previous literature which bundles recognition with other benefits given to compliers (Slemrod et al. 2022).

This paper is related to a growing literature on strengthening property tax collection in sub-Saharan Africa (Knebelmann 2019, Okunogbe 2019, Cohen 2020, Bergeron et al. 2019, Balan et al. 2022, Weigel 2020, Collin et al. 2021). We are the first in this literature to study the effects of public disclosure policies. Additionally, by benchmarking our treatments against comparably cost-effective policies, we add to a growing literature that finds a positive effect of enforcement reminders (Brockmeyer et al. 2023, Cohen 2020, De Neve et al. 2021, Dwenger et al. 2016, Castro & Scartascini 2015), though Mascagni & Nell (2022) find insignificant effects of similar ‘deterrence’ messages in Rwanda. By providing these benchmark treatments, we provide a strong evidence base against the use of public disclosure policies given their relative ineffectiveness at raising tax payments and potential ethical issues.

The remainder of this paper is organized as follows. In Section 2, we we present background evidence on the property tax, compliance, and enforcement capacity in Kampala that informs our study. In Section 3 we outline key mechanisms through which public disclosure policies may affect compliance and their relevance in the Kampala context. In Section 4, we detail our experimental sample, design, estimation strategy, and main outcomes of interest. In Section 5, we develop a model of tax evasion to help interpret our findings. Our empirical results and the insights they provide through our conceptual model are presented in Section 6. Section 7 provides further discussion of our results and their policy implications, and Section 8 concludes.

2 Property taxes in Kampala

Property taxes can offer a significant source of funding for city governments around the developing world who are faced with limited municipal revenues, rapidly growing populations, and rising demand for urban public services. Property taxes play an important role in revenue collection for the Kampala Capital City Authority (KCCA), contributing 47% of own-source revenues in FY 2021/22. As shown in Figure A1, property tax revenues far exceed revenues from all other collection instruments at the KCCA’s disposal.

The property tax in Kampala is called “Property Rates”. It taxes a share (6%) of a property’s “Rateable Value”, which is a professional assessor’s estimate of the typical rental income for a property with given observable characteristics, minus a fixed proportion to account for vacancies. Property Rates are applied to all rented residen-

tial, commercial and institutional properties across the five urban divisions of the city.⁷ Owner-occupied properties are exempt, so our study population is exclusively landlords who earn rental income from their property. From our baseline survey, the median property owner’s liability is 2.1% of their household total income, and 5% of their household rental income.

The property tax roll had been limited to a relatively small set of properties. However, from 2016 to 2019, the KCCA successfully expanded the property tax net through mass enumeration, addressing, and valuation of properties in the city. In this process they collected ownership information, GIS coordinates, and property attributes for over 300,000 properties in the city. Panel b of Figure A1 shows how the relative importance of property rates in revenue collection has increased over time.

2.1 A compliance challenge

Despite its importance for KCCA own-source revenues, compliance rates with the property tax are very low. From 2019 to 2021, only 10-11% of properties paid their annual liability each year.⁸ While low, Kampala is not an outlier for cities in low-income countries. Figure A2 plots compliance rates for property taxes in a select set of cities around the world where studies are available. Kampala’s compliance rate is similar to that of cities in other African countries, and while cities in Latin America tend to perform somewhat better, their compliance does not exceed the 60% mark.

Revenue collection figures look more encouraging than compliance rates since compliance is positively correlated with liability. In Figure A3, we plot actual and potential revenue collection by ventiles of property value over the years 2019-2021. It is apparent that the highest value properties contribute the largest share of revenue. In sum, the KCCA has collected 39% of the potential revenue from property taxes over this period.

2.2 Weak capacity for enforcement

While there are many different factors that may affect a taxpayer’s decision to pay taxes, the literature agrees that enforcement capacity is the dominant determinant of compliance (Luttmer & Singhal 2014, Slemrod 2019). Cities in low-income countries like Kampala often have severely limited enforcement capacity, especially in the face of very low city-wide compliance rates that would require enforcing penalties on a majority of taxpayers.

In theory, there are a number of enforcement measures that the KCCA can take once property tax payments are not received by the official deadline. First, the city has legal

⁷There are some exceptional cases where property rates are not based on rental value, but rather business income. These special cases occur when the property owner runs a business from their property. The most common cases these are high end hotels, hospitals, and gas stations.

⁸Unless otherwise noted, statistics in this section come from authors calculations using the administrative and survey data outlined in Section 4.3.

authority to take tax delinquents to court to recover the amount by warrant. Second, taxes can be demanded from tenants, allowing them to deduct those payments from rent. Third, properties in arrears can be locked up to prevent use until payments are made.⁹ Finally, interest payments are charged to properties in arrears.

However, according to our baseline survey, less than half of taxpayers find the threat of fines, court action, or lock ups to be “very important” in making tax payment decisions. This is in large part because taxpayers do not see these as credible threats. Of those who did not find these measures to be important, 49-62% either believed the KCCA is unlikely to take these actions, or that they do not have the legal authority to do so.

In contexts of low compliance and limited enforcement capacity, many cities are exploring the potential for public disclosure—the publicising of information on tax payments—as a low-cost means to raise compliance.

3 Public disclosure as a ‘social’ enforcement

There are (at least) three possible mechanisms through which public disclosure can affect compliance: shame in delinquency or pride in compliance, the desire for privacy of ownership status, and the effect of information dissemination on compliance beliefs and tax morale. Here we outline these in detail, and discuss their relevance in the Kampala context.¹⁰

3.1 Delinquency status and shame

Perhaps the main mechanism through which public disclosure policies are thought to operate is the shame of delinquency, or pride in compliance. When their tax delinquency is made public, tax delinquents may feel that this heightens the expected social sanctions they will face from members of the public. Related, when tax compliance is made public, tax compliers may feel that this heightens the expected social gains they receive.

Shame and pride mechanisms have been shown to be important in raising compliance in high income countries (Perez-Truglia & Troiano 2018, Angaretis et al. 2022, Bø et al. 2015). However, it is possible that norms are entirely different in certain contexts - particularly where compliance rates are very low and public service provision limited as they are in many African cities. In theory, it could even be that net social sanctions are actually imposed on compliers rather than delinquents. These type of anti-compliance norms may exist if for instance, people are ashamed to be seen as one of the few ‘suckers’

⁹Property lock-ups to enforce tax payments are typically reserved for commercial properties, and not used on residential rentals.

¹⁰There is no ‘whistleblower’ channel because the city knows the tax liability with certainty. In other contexts the truthful reporting of the tax liability is another important consideration, e.g. self-reported income tax (Slemrod et al. 2022).

who pay their taxes in a population of delinquents.

In our baseline survey, we asked respondents questions relating to social norms around compliance and delinquency. More than 70% of respondents considered not paying property rates “wrong but understandable”. When asked explicitly about social gains to compliance, the modal response is that taxpayers are ‘very unlikely’ to gain respect if they are known to pay, and the majority believe that it is ‘very unlikely’ for a known delinquent to face social costs (see Figure 1a). Further, in our follow-up survey we asked respondents to list costs and benefits to compliance and delinquency being made public. Just under half of respondents saw gains to public compliance from being ‘seen as morally good’ and costs to public delinquency as being ‘seen as immoral’, but very few respondents cite any more substantial financial or material gains or costs (see Figure 2a and 2b). This suggests that tax compliance norms in the Kampala context are weak, and so we may expect the shame and pride mechanisms in the effects of public disclosure policies to be muted.¹¹

3.2 Property ownership status and privacy

In disclosing property tax compliance or non-compliance, these policies also disclose an individual’s tax eligibility status. This may be a pertinent issue since ownership of rental properties is not widely known - there is no public database of property owners in Kampala and almost half of respondents in our follow-up survey noted that property ownership is often kept secret even from family inside the household (see Figure A5).

Having ownership made public could be seen as beneficial. It may signal of wealth and raise a taxpayer’s perceived social status. As respondent #302 noted in our follow-up survey, “people want to associate with someone who has something”. Public knowledge may also enhance security of ownership in a context where, according to our baseline survey, 45% of taxpayers do not have documented proof of property ownership such as land titles, property transfer certificates, tax receipts, rental contracts or utility bills.

However, it could also result in additional taxation in the form of pecuniary or in-kind demands from family or other social connections (Jakiela & Ozier 2015). In our follow-up survey, property owners in Kampala note a number of financial and material costs associated with ownership being made public with financial favours from family being the most common (see Figure 2c). As noted by respondent #352, “When they know you are the owner of that building, the family is on your neck”. Related to this - property owners may want to maintain privacy of their ownership status due to security concerns. Another commonly cited cost was concerns about robbery or violence.

Property owners may also wish to keep their property private to avoid other financial

¹¹In addition, we do not find any suggestive evidence of anti-compliance norms. Very few respondents cited any costs to public compliance or gains to public delinquency (see Figure A4a and A4b).

obligations. In contexts like Kampala, where property is subject to different local and national taxes, public disclosure by the city may reveal tax-liable properties to other authorities. In our follow-up survey, respondent #22721 mentioned that a cost of publicly disclosing property ownership would be that “[the Ugandan Revenue Authority] will come to know about [the property] and...impose more tax.” Further, in a context where ownership is not always formally secure, owners who obtain their property through informal means may be particularly concerned about keeping this private.

So while the norms around compliance and delinquency appear to be weak, our follow-up survey reveals suggestive evidence that taxpayers perceive costs to having ownership of rental properties made public.

3.3 Compliance beliefs and morale

The primary aim of public disclosure policies is to incentivize taxpayers to comply by threatening to publish their delinquency or publicly recognize their compliance. However, the publication of this behavior has the potential to induce a secondary indirect effect by causing the recipients of this information to change their beliefs about compliance in their city. If taxpayers are motivated to pay when they know that others pay too, then public disclosure policies may also affect the compliance of recipients.

These indirect effects may come about as the result of taxpayers being influenced by the behavior of particular groups of taxpayers - celebrities or politicians, for example - or simply by general compliance rates in the city. Both of these appear to be true in Kampala - 78% of taxpayers in our baseline survey completely or somewhat agreed that they would be more likely to pay their taxes if they knew that the majority of properties in Kampala were paying their share. Additionally, 70% completely or somewhat agreed that they would be more likely to pay their taxes if they knew that wealthier and more influential individuals were paying their taxes.

The expected effect of disseminating true information about the compliance rate will depend on baseline beliefs of the compliance rate (Del Carpio 2022). If taxpayers already know the compliance rate, providing information on this is unlikely to affect their behavior. If they are pessimistic, information about the compliance rate may improve their tax morale, whilst if they are overly optimistic, information may actually demotivate them from paying their taxes. In Kampala, perceived compliance at baseline is low, but still substantially overestimates the actual compliance rate. Figure 1b plots histograms of beliefs about compliance from our baseline survey. The average belief for city-wide property tax compliance is just under 50% compliance, much higher than the true 10% rate. Respondents correctly believe that compliance is higher for wealthy taxpayers, but overall remain substantially optimistic relative to the true 22% rate. Since prior beliefs are highly optimistic and taxpayers report that they are positively influenced by the com-

pliance of others, signals about the true compliance rate will lead them to update their beliefs downwards, and become demotivated to comply. We may expect public disclosure policy to induce negative indirect effects in this context.

4 Experimental design and estimation strategy

We designed an experiment in collaboration with the KCCA Directorate of Revenue Collection to achieve two broad research aims. First, to separately identify the effects of publicly reporting delinquents (the “stick”) from those of publicly recognizing compliers (the “carrot”). To do so, we randomly assign property owners to sub-treatments that vary by disclosure type (reporting or recognition). Second, we aim to separately identify the direct effect of public disclosure on those warned their behavior will be made public from the indirect effect of publicly disclosing this information on other’s behavior. To do so, we stagger our experiment across two waves and cross-randomize our treatments so that direct effects are tested in wave one (May-June 2021), and indirect effects are tested in wave two (Nov-Dec 2021). Table A1 gives the full study timeline.

Outcomes are measured at the property level, so the observational unit is the property. However, randomization was clustered at the phone number level so that all properties with the same phone number receive the same treatment. In our empirical analysis we always cluster standard errors at the owner level. We block-randomized, stratifying wave one treatments into 40 strata based on ventiles of total property value and a dummy for whether tax was paid at baseline (2019/2020) for at least one of the properties. The second wave additionally adds the eight treatment groups from wave one to give a total of 320 strata. We use machine randomization to generate lists of properties for each treatment group. Lists were uploaded by staff at the KCCA to automatically send treatment messages through their standard SMS communication system.

Six weeks in advance of a payment deadline, an initial standard message is sent out for each property (multi-property owners receive multiple standard messages) in both English and Luganda. This message is identical regardless of the treatment group and notifies the recipient of the amount due on the property as well as the deadline for payments. The exact wording and translations of the standard message and all other messages can be found in Tables A2 and A3. Experimental variation is introduced through a set of follow up messages. In both waves, each property owner receives a text message corresponding to their treatment group sent periodically six, four, and two weeks prior to the deadline. The following sections describe these treatment messages and their content.

4.1 Direct Effects: randomizing notice of public disclosure

The first intervention focuses on the direct effects of public disclosure by randomly varying the type of disclosure an individual will face. Property owners are assigned to one of three broad groups: Control, Public Disclosure, and Benchmark Nudges. The Public Disclosure group is split into Reporting and Recognition, which are each split further by the mode of disclosure (SMS or an online list). The Benchmark Nudges group is split into three subgroups: Enforcement, Reciprocity, and Relationship Management. Figure 3a gives a diagram of the treatments arms.

Here we summarize the content of wave one treatment messages (see Table A2 for details). The Control group is simply sent a reminder to pay by the deadline. The Reporting group is notified that the KCCA will publicly report them as a defaulter if they do not pay their taxes on time. The Recognition group is notified that the KCCA will publicly recognize their contribution if they do pay their taxes on time. Finally, the Benchmark Nudges groups are sent different types of information messages: on enforcement measures the city can implement, on public services property rates contribute to, and on details of client relationship managers that taxpayers can contact with any issues.

4.1.1 Direct Effects: Estimating equation

The empirical specification for estimating direct effects is given below:

$$\begin{aligned} y_i = & \tau_S \text{reporting}_{o(i)} + \tau_H \text{recognition}_{o(i)} \\ & + \gamma_1 \text{enforcement}_{o(i)} + \gamma_2 \text{reciprocity}_{o(i)} + \gamma_3 \text{relationship management}_{o(i)} \\ & + \eta_{s_1(o)} + \epsilon_i \end{aligned} \tag{1}$$

where y_i is one of the outcomes outlined in subsection 4.4 for property i . The terms $\text{reporting}_{o(i)}$, $\text{recognition}_{o(i)}$, $\text{enforcement}_{o(i)}$, $\text{reciprocity}_{o(i)}$, and $\text{relationship management}_{o(i)}$ are all dummies for treatment assignment to owner o of property i . Finally, $\eta_{s_1(o)}$ are fixed effects for the wave one strata s_1 that owner o falls into, and ϵ_i is an error term for property i .

Our main parameters of interest are τ_S and τ_H , i.e. the effects of reporting and recognition respectively. We are also interested in γ_1 , γ_2 , and γ_3 to benchmark τ_S and τ_H against effects of standard nudges. We also consider alternative specifications that estimate heterogeneous effects, or effects for subgroups.

4.2 Indirect Effects: randomizing public dissemination

The second intervention focuses on indirect effects by randomly varying the type of tax behavior disseminated. Property owners are assigned to one of two broad groups: Control,

or Public Dissemination which is split into three. The first two, Delinquents List and Compliers List, receives names of tax delinquents or compliers from wave one.¹² A third group, Wealthy Compliers List, receives names of compliers from wave one who have paid at least 2mn UGX (which represents the top 5% city-wide property wealth).¹³ Figure 3b gives a diagram of the treatment arms.

Here we summarize the content of wave one treatment messages (see Table A3 for details). The Control group is simply sent a reminder to pay their tax by the deadline. The Delinquents List receives a message explaining that owners who did not pay in the previous year are being reported, and given a list of these owner names and parishes. The Compliers List receives a message explaining that owners who did pay in the previous year are being publicly recognized for their contribution, and given a list of these owner names and parishes. Importantly, in all dissemination treatments, only individuals who were assigned to the relevant treatment group in wave one, and have therefore been warned, are reported or recognized.

4.2.1 Indirect Effects: Estimating equation

The empirical specification for estimating indirect effects is below:

$$y_i = \kappa_S \text{delinquents}_{o(i)} + \kappa_H \text{compliers}_{o(i)} + \eta_{s_2(o)} + \epsilon_i \quad (2)$$

where the terms $\text{delinquents}_{o(i)}$ and $\text{compliers}_{o(i)}$ are dummies for treatment assignment for owner o of property i , and $\eta_{s_2(o)}$ are fixed effects for wave two strata s_2 .

Our main parameters of interest are κ_S and κ_H , i.e. the effects of receiving lists of delinquents and compliers respectively. We also consider alternative specifications for heterogeneous effects, or effects for subgroups (including the Wealthy Compliers List).

4.3 Data and Sample

4.3.1 Administrative data

We use administrative data from the Kampala Capital City Authority (KCCA) to create our primary outcomes of interest, baseline covariates, and sampling frame. These are data extracts from the property owner registry, annual property bills, and property rate payment histories from the KCCA eCitie tax database. Appendix Figure A6 provides a map of property density, villages, and parishes in Kampala.

¹²We focus on these two, but they are also further split by the pool of people from which to list and different modes of dissemination (15 randomly sampled neighbors, 15 randomly sampled names from the city, or an SMS link to complete lists on a webpage).

¹³There is no Wealthy Delinquents List. The wealthy are just as likely to be disclosed, but we were unable to publicize the wealth status of reported delinquents. We treat it as a third group to keep the Delinquents and Compliers List treatment groups compositionally comparable.

The main sample that we use in this study is based on the set of properties for which we have administrative data. We take all properties that had a positive tax balance due by the endline date as of the start of our interventions.¹⁴ Given that our two experimental interventions are conducted before a different deadline for property tax payments, for endline one, we select properties with a balance on May 14th for some amount owed by June 30, and for endline two we select properties with a balance on Nov. 17th for some amount owed by Dec. 31st. We discarded properties that had recorded official objections to their valuations that had not yet been resolved in court. This leads our endline one and endline two samples to differ slightly; at endline one we have 174,304 properties and at endline two we have 161,709 properties.

The registry includes all property owners in Kampala and each is identified with an ID called COIN. The registry records contact information for the property owner: first and last name, or name of legal entity (when relevant), phone number, and village of residence. The bills are created every year on July 1st for each taxable property identified with an ID called `propertyno`. The bills record the rateable value of the property, the annual liability (which is 6% of the rateable value) and the outstanding balance. The payment histories record the amount and date of each payment made towards a property. Both bills and payments are extracted for the entire study period starting from the 2019/2020 financial year. We match owners from the registry to bills by COIN, and then bills to payments by `propertyno`. Further, each property has an ID called CAMVID that links to characteristics of the property collected for the Computer-Assisted Mass Valuation (CAMV) programme. These characteristics include the property’s location (parish, village, and GPS coordinates), type (residential, commercial, institutional, etc.) and other property features. Appendix Table A4 has full definitions of all administrative data variables used in our analysis.

4.3.2 Baseline survey

In November and December 2020 we conducted a baseline survey with 1,172 property owners that were assigned to our control or public disclosure treatments (about 2% of the full sample) to collect information on their baseline characteristics, behaviors, and beliefs.¹⁵ This data is used to run descriptive statistics of the property tax context in Kampala (Section 2).¹⁶ As can be seen in Table A5, our survey respondents are somewhat selected to be higher value properties, and in areas with lower population density.

¹⁴Note that it is for this reason, why in our estimating samples the control group mean compliance rate is around 4-5% while the full compliance rate is closer to 10-11%.

¹⁵To create a representative sample, we randomly sampled taxpayers from the KCCA registry. The randomization was stratified by total property value, past compliance, and year 1 treatment. We completed 1,172 surveys after having approached a total of 2,076 taxpayers.

¹⁶The baseline survey is not large enough to conduct heterogeneity analysis of our main results.

4.3.3 Endline survey

In January and February 2022, after both waves of treatments had been completed, we conducted an endline survey to collect more proximate outcomes from 4,960 property owners (about 5% of the full sample). To create a representative sample, we randomly sampled taxpayers from the KCCA registry. The randomization was stratified by total property value, past compliance (a dummy if the property paid at least their annual liability in the 2019/2020 financial year), and year 1 and year 2 treatment groups.

We completed 4,960 surveys after having called a total of 8,525 taxpayers. Of the 3,853 that we were unable to survey, 63% never answered phone, 22% claimed not to be the correct person from the KCCA database, and 13% refused to be surveyed. The endline survey is used to create an important sample in our analysis. For specifications where we use outcomes from our endline, we use the same main sample as outlined for the administrative data, but further restrict properties to those owned by an owner that was selected for and completed our endline survey. This implicitly means that non-valid phone numbers and unanswered phone calls are excluded from our endline samples, but not from our main sample. Appendix Table A6 has full definitions of all endline survey data variables used in our analysis.

In Table A5 column 2 we investigate whether attrition is correlated with baseline characteristics. From here we can see that individuals who had paid their taxes the year previously were about 8 percentage points more likely to be in our survey. None of the other baseline characteristics are significantly correlated with attrition. We take two steps to address selection bias due to attrition in our endline survey. First, for all of our results using the endline survey outcomes, we confirm robustness to Inverse Probability of Attrition Weighting. These weights are estimated by a logit regression on the baseline characteristics in Table A5. Second, we demonstrate that our assignment of treatment is not correlated with attrition. Results in Table A7 Column 2 show that none of our treatments have a significant effect on endline attrition.

4.3.4 Follow-up survey

In April 2024 we conducted a final follow-up survey with 56 property owners across Kampala city that were assigned to our public disclosure treatments to better understand mechanisms underlying results. We talked to these taxpayers in detail about costs and benefits to public knowledge of ownership, tax delinquency, and tax compliance, and their reactions to our experiment messages. This survey involved a combination of quantitative questions and open discussion both of which we use as detailed descriptive evidence on perceived social costs and benefits of public disclosure. A representative list of respondent quotations is in Appendix Section E. Our respondents were sampled by randomly selecting 20 parishes stratified by four different types - either high or low mean property value,

and either from Central areas of the city or from the districts on the outskirts. From these parishes we invited a random selection of property owners to attend our follow-up survey.

4.4 Outcome measures

4.4.1 Outcomes from administrative data

Our main outcome in both waves is tax compliance and we measure it in three different ways: 1) an indicator if total payments made in the treatment period covered at least the annual liability of the property, 2) an indicator if any payment was made towards the property during the treatment period, and 3) the share of the annual liability made in payments towards the property in the treatment period. All of these outcomes are scaled so that they can be interpreted as percentage points.

4.4.2 Outcomes from survey data

We use our endline survey to measure more proximate outcomes for a sample of properties. Here we focus on five taxpayer sentiments: 1) belief about the compliance rate of properties in Kampala as a whole, 2) belief about the compliance rate of owners with the most expensive properties in Kampala, 3) belief about the compliance rate of owners in the same village as the respondent, 4) belief that the KCCA can detect who pays tax, and 5) belief that the KCCA acts in the best interest of its citizens. All of these outcomes are scaled so that they can be interpreted as percentage points.

4.5 Pre-treatment balance

Tables A8 and A14 report balance tests for effects of treatments in the first and second waves on baseline property characteristics. Inevitably some treatment effects are significantly different from zero. As discussed in Bruhn & McKenzie (2009), statistical significance of treatment effects on baseline variables is not an appropriate test for whether these variables might happen to affect the outcome of an experimental trial because, first, randomization implies that any unbalance necessarily occurred by chance, and second, for any such chances even small unbalance can be problematic if the variable is highly correlated with the outcome of interest. For this reason we address potential concerns related to unbalance by demonstrating robustness of our main results to inclusion of all measured baseline variables. These robustness checks are in Tables A9 and A15 and have very little impact on our main treatment effects, as discussed below. Nevertheless we report the Tables A8 and A14 with balance tests for full transparency.

5 Modelling evasion under social image concerns

We develop a model of tax evasion in the spirit of Allingham & Sandmo (1972) that incorporates social image effects using the framework outlined in Bursztyn & Jensen (2017). The model provides a structural framework to interpret our empirical estimates of public disclosure effects.

Each tax liable property owner gets utility depending on their decision to evade the tax or not, $e \in \{0, 1\}$. Evasion can affect utility through pecuniary m , intrinsic i , and social s payoffs. To keep the problem tractable, we treat these as additively separable in utility following Gordon (1987). For notational convenience we denote each of these payoffs as the utility value for compliers plus the net expected utility value for evaders, e.g., the pecuniary payoff is $m_0 + em$ where m_0 is the expected utility given the choice to comply, and m is the net expected utility if choosing to evade. Finally, there is an idiosyncratic preference for compliance v with CDF $F(v)$ and $E[v] = 0$. Therefore, utility is given by: $U(e) = m_0 + i_0 + s_0 + e(m + i + s) + (1 - e)v$. Given this random utility setup, a utility maximizing property owner will choose to evade if $v < m + i + s$, which allows us to write the aggregate evasion rate as $\lambda = F(m + i + s)$.

5.1 Social image payoffs

Our analytical focus is on the social dimensions of the motivation to pay. Following Bursztyn & Jensen (2017), an individual receives social payoffs from their reference group:

$$s_j^t(e) = \delta_j^t E(\omega_j^t) \Pr_j(t = 1|e) \quad (3)$$

where $\Pr_j(t = 1|e)$ is the probability that reference group j thinks that the individual's type is t conditional on their evasion decision, e . In what is to come, this will be the key dimension through which public disclosure policy influences the evasion decision. The term $E(\omega_j)$ captures the individual's expectation about the social desirability, ω_j , of being seen by group j as type t . The term δ_j captures how much the individual cares about being perceived by group j as being of type t . In the following analysis we drop the subscript j and focus on a representative reference group for convenience, although in our experimental sub-treatments, we do vary the reference group that public disclosure targets.

We consider two categories of perceived types, $t \in \{o, d\}$. First, an individual can be perceived as either an owner of tax-liable property or not, $o \in \{0, 1\}$. Second, conditional on being perceived as an owner, an individual can be perceived as either delinquent or not, $d \in \{0, 1\}$. In our empirical setting we will not attempt to distinguish the δ and ω terms and so simplify as $\delta^o E(\omega^o) \equiv x$ and $\delta^d E(\omega^d) \equiv z$. In other words, there is a potential payoff x to being perceived as an owner of tax-liable property, and a potential

additional payoff z to being known as a delinquent. For example, an agent may bear a shame cost, $z < 0$, if the public imposes pro-compliance social sanctions, $\omega^d < 0$, and individuals tend to be conformist, $\delta^d > 0$. As another example, an individual may face a privacy cost, $x < 0$, if the reference group sees property owners as more able to provide favours, $\omega^o > 0$, but individuals prefer to avoid providing favours, $\delta^o < 0$.¹⁷ Finally, for notational convenience we denote $\Pr(o = 1|e) = p_e$ and $\Pr(d = 1|e) = q_e$.

Therefore the net social image benefit to evasion can be written as $s = s^o + s^d = [p_1 - p_0]x + [q_1 - q_0]z$. Together this gives us a structural equation for the aggregate evasion rate:

$$\lambda = F(m + i + [p_1 - p_0]x + [q_1 - q_0]z) \quad (4)$$

This is the formulation of the evasion rate that we will analyse in in the following sub-section to help us interpret empirical estimates of direct effects from our experiment.

5.2 Analysis of public disclosure policies

In this section will examine the share of evaders under different public disclosure policy regimes denoted $\{C, S, H\}$, where C denotes ‘control’ or no public disclosure, S denotes public reporting, and H public recognition. These states represent our empirical treatments outlined in Section 4. The government’s choice of policy regime will affect both the probabilities of being perceived as a property owner, p_e , and the probabilities of being perceived as a property tax delinquent, q_e . The counterfactual exercise we consider here holds all other payoffs constant.

First, we introduce θ as the individual’s perceived chance of being discovered through the public disclosure program. We think of “discovery” as the probability that people in the reference group identify the individual through the policy. For example, not everyone who is delinquent and reported through the public disclosure program will be discovered since text message dissemination may be ignored, people may not take the time to read online lists, etc.

Second, we define how each regime affects the probabilities of being perceived as a particular type. If an agent is not discovered through the public disclosure program, they face baseline probabilities denoted with an underline, i.e. $q_e = \underline{q}_e$ and $p_e = \underline{p}_e$. Further we simplify $\underline{p}_e = \underline{p}$, implicitly assuming that, without public disclosure, the decision to evade does not affect the likelihood that one is detected as a property owner. If an agent is discovered through the public disclosure program their disclosed types are known with

¹⁷While it is intuitive to think of privacy and shame costs, we do not impose signs on either x or z and leave these as empirical questions. Further, as in Bursztyn & Jensen (2017) the social image term in the utility function might arise from instrumental (e.g. your reference group excludes you from social networks) or hedonic (e.g. you get a bad feeling when strangers think you are a tax delinquent) motivations, and we do not try to separate these.

certainty, i.e. conditional on being discovered through public reporting $p_1 = 1$ and $q_1 = 1$, and conditional on being discovered through public recognition $p_0 = 1$ and $q_0 = 1$.¹⁸

Third, we assume that public disclosure policies induce a small enough change in payoffs that their effect on compliance can be approximated by a first order Taylor series. To simplify notation, we express the control regime net benefits of evasion as $\underline{B} \equiv m + i + z[q_1 - q_0]$. The first order approximation implies that, relative to the control regime, the direct effect of public reporting τ_S and public recognition τ_H on compliance can be expressed as:¹⁹

$$\tau_S \equiv \lambda_C - \lambda_S = -\theta[x(1 - \underline{p}) + z(1 - \underline{q}_1)]F'(\underline{B}) \quad (5)$$

$$\tau_H \equiv \lambda_C - \lambda_H = -\theta[-x(1 - \underline{p}) + z\underline{q}_0]F'(\underline{B}) \quad (6)$$

Intuitively, effects will be zero if there is no chance of being discovered through the public disclosure scheme (i.e. $\theta = 0$), or that there is no variation in the idiosyncratic motivation to comply near the baseline state (i.e. $F'(\underline{B}) = 0$).²⁰

Examining the effects of either policy alone confounds the social image payoffs of property ownership, x , and the social image payoffs of tax delinquency, z .²¹ To isolate the role of social payoffs to delinquency, we can take the sum of effects:

$$\tau_S + \tau_H = -\theta z[1 - \underline{q}_1 + \underline{q}_0]F'(\underline{B}) \quad (7)$$

where privacy payoffs notably drop out. If the sum of the treatment effects is positive this suggests that being perceived as a delinquent is costly ($z < 0$), if their sum is negative then delinquent status provides some gain ($z > 0$), and if the sum is zero then the payoff from delinquent status is zero. In Section 6.1 we use this structure to test empirically for delinquency status payoffs.

¹⁸We elaborate on this specification in Appendix section C.1.

¹⁹We provide more detailed steps in Appendix section C.2.

²⁰There are also some edge cases. There will be no effect of reporting when property owner status is believed with certainty at baseline ($\underline{p} = 1$) and the probability of being believed as a delinquent under evasion is also believed with certainty ($\underline{q}_1 = 1$). Likewise, there will be no effect of recognition when ($\underline{p} = 1$) and ($\underline{q}_0 = 0$). We can discard these theoretical cases based on our empirical results in Section 6.1 which find that both reporting and recognition effects are significantly different from zero.

²¹For instance, if the social image payoffs are negative ($x < 0$ and $z < 0$) then public reporting will unambiguously raise compliance, but the direct effect of public recognition will be ambiguous and depend on whether the change in expected social image payoffs of delinquency $z\underline{q}_0 < 0$ outweighs the expected social image payoffs of property ownership $-x(1 - \underline{p}) > 0$.

6 Results

6.1 Direct Effects: estimates of public disclosure

We first test for direct effects of public disclosure on tax compliance. Our main results are reported in Table 1 Panel A, following the specification in equation 1 with our three measures of tax compliance as outcomes. Similar results are found in Appendix Table A9 which includes baseline controls as a robustness check.

There are three takeaways on public disclosure effects from Panel A of Table 1. First, the direct effect of reporting delinquency raises compliance. Properties whose owners are told that tax delinquency will be publicly reported are 0.58 percentage points more likely to pay their liability. While small in magnitude, this is a substantial increase of 17% on the control group mean of 3.4% (col. 1).²² The percentage change on the control mean is slightly higher (19%) if we measure tax compliance as any payment being made (col. 2), or as the share of the property’s liability paid (col. 3).

Second, the direct effect of recognizing compliance *lowers* compliance. Properties whose owners are told that their tax compliance will be publicly recognized are 0.55 percentage points less likely to have their liability paid for, a 16% decline on the control group mean (col. 1). The percentage decline on the control mean is slightly larger (19%) if we measure tax compliance as any payment being made (col. 2), and slightly higher still (20%) measuring compliance as the share of the property’s liability paid (col. 3).

Third, the recognition and reporting effects are opposite signed, but of similar magnitude, i.e. $\hat{\tau}_S + \hat{\tau}_H \approx 0$. From column 1, the difference in point estimates is just 0.028 (around 5% of the size of either treatment effect) and the p-value for the test that these coefficients sum to zero is 0.94 (see foot of panel). This finding has important implications in the section that follows.

6.1.1 Linking to the model: what do direct effects tell us?

Treatment effect estimates for both recognition and reporting are both non-zero. Using equations 5 and 6, this implies that $\theta > 0$ and $F'(\underline{B}) > 0$. Equations 5 and 6 also highlight that each treatment effect alone confounds privacy and delinquency status payoffs. To separately identify the two channels, we can use equation 7. As discussed above, the sum of the treatment effect point estimates is close to zero and we cannot reject that they are zero. Following equation 7, this implies that $z \approx 0$. Therefore, under the structure of the model, our empirical results cannot reject the null hypothesis that there is no shame cost to property tax delinquency on average.

²²Note that the control group mean compliance is less than the annual rate reported in Section 2. This is due to the sample restriction: we exclude properties which have fully cleared their annual balance before our experiment began.

Returning to equations 5 and 6 with $z = 0$, our empirical estimates imply that the social payoff to ownership status being known is negative on average.²³ Therefore, what is driving the direct public disclosure effect is not a social cost to delinquency status being made public, but to ownership status being made public (a ‘privacy cost’).

The finding that on average shame costs are zero may appear to be in conflict with findings from our follow-up survey, where only 9% of interviewed property owners say that there are neither costs to being perceived as a delinquent nor gains to being perceived as a complier. However, when asked to describe what these costs are, delinquency being immoral and compliance being seen as moral are cited by 38% and 43% of respondents respectively, four to five times more likely than any other costs or gains (see Figures 2a and 2b). Very few respondents cite financial or material costs to delinquency status. When asked about ownership status being made public, 96% said that there would be privacy costs. Further, when describing these costs, kin taxes are the most frequently cited (see Figures 2c). Respondents cited financial favours from family outside the home (38%), friends (33%), family inside the home (36%) or their spouse (36%). In addition, risk of robbery and risk of violence are each cited by 23% of respondents. Stated privacy costs appear predominately financial and material in nature, which may have greater sway over tax payment decisions.

To summarize, our model, empirical estimates, and descriptive interviews all suggest that concerns about the privacy of property ownership, rather than the shame of delinquency, drive the direct effects of public disclosure in our context. Disentangling these mechanisms is important to understand the underlying tax morale determinants of compliance. In this case, social image motivations to comply appear limited.

6.1.2 Direct Effects: heterogeneity

We have established that our empirical results are consistent with there being no shame cost to delinquency on average. It could be that most people’s preferences are similar to this average, or it could be that there is heterogeneity. Perhaps some taxpayers feel shame costs, while others see a benefit to being publicly known as a delinquent. We explore treatment effect heterogeneity across three key dimensions along which we might expect privacy and shame costs to differ: the value of the property, the total value of the owner’s properties, and the local compliance rate (either in the village or parish of the property) at baseline.

Table A10 gives results estimating heterogeneity in treatment effects by tercile of each baseline measure. The direct effect of recognition is significantly more negative for the highest value properties, while the reporting effect is not significantly different across these terciles (col. 1). The results are similar along other dimensions (cols. 2-4), though

²³e.g. $x = \frac{\hat{\tau}_S}{-\theta F' B(1-p)} < 0$ and $x = \frac{\hat{\tau}_H}{\theta F' B(1-p)} < 0$.

the differential recognition effect in the third tercile tends to be weaker. In no cases can we reject the null that the reporting and recognition effects sum to zero (our test for shame costs) for any of the terciles. Therefore, while there is some indication that shame costs may be relatively more important with lower property value or owner wealth,²⁴ we do not have strong evidence for this.

6.1.3 Comparing Direct Effects with Benchmarks

Returning to Table 1 Panel A, we report estimates of benchmark effects in the bottom of the panel. While there is no effect of messages that appeal to reciprocity (reminding taxpayers of the services their tax payments contribute to) and relationship management (reminding taxpayers of the contact number to call for any questions or concerns), we do find relative large effects of enforcement reminder messages. Properties whose owners were reminded of legal action that the government can take against delinquents are 1.29 percentage points more likely to have their liability paid for, a 38% increase on the control group mean. This is roughly twice the magnitude of the direct effects of reporting. These effects are consistent with a growing literature that finds modest positive effects of enforcement messages (Brockmeyer et al. 2023, Cohen 2020, De Neve et al. 2021, Dwenger et al. 2016, Castro & Scartascini 2015).

6.1.4 Direct Effects: sub-treatments and endline beliefs

In addition to the preceding analysis of direct effects, we look at sub-treatment effects by mode (SMS vs online disclosure) and find no evidence that the direct effects of public disclosure (recognition or reporting) vary by whether disclosure will be online rather than SMS (see Appendix Table A11). We also explore whether our treatments from wave one effect endline survey beliefs in Appendix Table A12. We find no significant effects of direct effects on these beliefs. It could be that any such effects dissipated over the seven month gap between wave one of our experiment and the endline survey.

6.2 Indirect effects: estimates of public dissemination

In the second wave, we test for indirect effects of public disclosure on tax compliance. Our main results are reported in Table 1 Panel B, following the specification in equation 2 with our three measures of tax compliance as outcomes. Similar results are found in Appendix Table A15 which includes baseline controls as a robustness check. There are two takeaways on indirect effects of public disclosure from Panel B of Table 1.

First, and perhaps unsurprisingly, the indirect effect of reporting delinquency lowers compliance. Properties whose owners received lists of tax delinquents are 0.65 percentage

²⁴A more negative treatment effect in the top terciles suggests that either privacy costs are larger or shame costs are smaller or even negative for this group, and vice versa for those in the bottom terciles.

points less likely to pay their liability, a 21% decline on the control group mean of 3.1% (col. 1). The percentage decline on the control mean is slightly smaller (19%) if we measure tax compliance as any payment being made (col. 2), and slightly larger (22%) for share of liability paid (col. 3). So, while the threat of being reported induces compliance, disseminating these reports lowers others' compliance. On net, the 0.58pp direct effect from threatening to report delinquency is cancelled out by the -0.65pp indirect effect from disseminating delinquent lists.

Second, the indirect effect of recognizing compliers also lowers compliance. Properties whose owners received lists of tax compliers are 0.78 percentage points less likely to pay their liability, a 24% decline on the control group mean of 3.1 percentage points (col. 1). The percentage decline on the control mean is smaller (17%) if we measure tax compliance as any payment being made (col. 2) or for share of liability paid (22% from col. 3). Across all columns we cannot reject that the Delinquent List and Complier List effects are equal, i.e. $\hat{\kappa}_S = \hat{\kappa}_H$ (see p-values at foot of table).

These results help rule out *ex ante* plausible explanations for negative delinquent list effects: that receiving a list of delinquents makes that particular choice more salient, or that seeing delinquents demotivates taxpayers. Both of these 'framing' explanations would imply opposite effects from receiving complier lists. These results also rule out the possibility that these lists signal that tax behavior in wave two will be published. In this case, we would expect indirect effects to mirror direct effects, e.g. receiving a list of delinquents should raise compliance.²⁵

6.2.1 Indirect Effects: endline survey outcomes

To explore further what could cause both Delinquents List and Complier List treatments to lower compliance, we turn to our endline survey which measures more proximate outcomes. Main results are in Table 2, and here we focus on the sample of properties with an owner responding to our endline survey.²⁶ We first discuss results on compliance beliefs in Panel A, and then turn to compare these with alternative beliefs (that represent *ex ante* likely channels) and apply multiple hypothesis corrections in Panel B.

Starting with column 1 of Table 2 Panel A, the estimates of indirect effects on compliance show that main results from the full sample hold for the survey respondents. In fact, they are about 2.3-2.5 times larger. This could reflect the endline sample mechanically excluding taxpayers with a disconnected phone or a wrong number.²⁷ As noted above,

²⁵Further, Appendix Table A18 shows small and insignificant effects on the endline belief that tax behavior will be published in the future (panel B col 3).

²⁶Respondents may select into the survey, so we confirm that all results using the endline survey are robust to re-weighting to account for attrition as predicted by baseline characteristics (not shown). Specifically, we run all specifications applying Inverse Probability of Attrition weights estimated from a logit regression on the baseline characteristics in Appendix Table A5.

²⁷Notably this is still true after applying attrition weights, so baseline characteristics do not fully capture this selection.

39% of those sampled either could not be reached by phone or were the wrong person. This can explain much of the difference in the point estimates between the two samples.²⁸

Columns 2-4 in Table 2 Panel A show indirect effects on compliance beliefs. Delinquent List effects cause a decline in beliefs on the city wide compliance rate by -2.3 percentage points (col. 1) and beliefs on the compliance rate of owners with the most expensive property by -4.6 (col. 2), but beliefs on the compliance rate in the village is unchanged (col. 3). Receiving a list of tax compliers has similar but noisier effects: beliefs on the city wide compliance rate fall by an imprecise -1.6 (col. 1), beliefs on the compliance rate of the most expensive properties by a precisely estimated -3.5 (col. 2), and beliefs on the compliance rate in their village fall by an imprecise -1.3 (col. 3).

Moving to Panel B, columns 1-3 repeat the compliance beliefs and we add two additional belief outcomes: whether the KCCA has the ability to detect who does and does not pay taxes (col. 4) and whether the KCCA acts in the best interests of citizens (col. 5). The former aims to capture belief updating on taxpayer legibility to the state (Okunogbe 2019), and the latter to capture changes to the perceived relationship with the state, or ‘reciprocity’ (Luttmer & Singhal 2014). This panel tests multiple alternative hypotheses and so we apply corrections for the False Discovery Rate (Benjamini et al. 2006). The only estimates with p-values (square brackets) below the conventional 5% level of significance are the three significant estimates on compliance beliefs from Panel A mentioned above. Once we apply corrections for the False Discovery Rate, only the treatment effect of Delinquent Lists on the belief that the rich comply is significant at the 5% level (sharpened q-value in curly braces). In sum, a likely channel through which Delinquent and Complier lists affect compliance is the proximate effect on compliance beliefs especially of the rich, yet evidence for the effects of Complier lists is weaker.

These results are consistent with both Delinquent and Complier Lists providing an informative signal of the true compliance rate, and therefore causing taxpayers to lower their beliefs downwards towards the truth. We saw that over optimism about compliance at baseline, and the endline survey also demonstrates substantially biased beliefs. The control group mean belief of the compliance rate is 53% versus the actual 10%, and for the compliance rate of the top 5% of property owners it is 62% versus the actual 22%. Further, note that control group mean beliefs of compliance in their own village are much lower (34%) and we find no evidence of treatment effects on this belief. This suggests people are, understandably, better informed about their own village and so treatments do not shift their beliefs in this dimension.

Neither list treatment provides statistics on the compliance rates, so how might taxpayers infer that their priors were over estimates? It could be that the very act of sending out lists sends a signal to taxpayers that the city government is going to extreme measures to raise compliance, and so current compliance must be low. It could also be that

²⁸e.g. $-1.76 * 0.61 + 0 * 0.39 = -1.06$ is close to the -0.78 from Table 1 Panel B.

the lists (even only 15 names) and a noticeable lack of statistics signal to taxpayers that the KCCA is strategically avoiding sharing the true compliance rate, so it must be low. For instance, respondent #33404 explains “they could have communicated in percentages those who paid and those who did not pay ... like 70%, then you would think that «I may be amongst the remaining 30% that has not paid. Let me also go and pay.» But from the message, since just a few people who paid are listed, it is discouraging.”

The evidence presented suggests a causal chain of public dissemination effects on compliance. First, the lists cause people to update their beliefs about the compliance of others downwards, and second, these diminished beliefs reduce tax morale and the propensity to comply.

As a final exercise, we estimate this second causal effect with an instrumental variables approach. Under the assumption that the list treatments do not directly affect compliance except through their effect on compliance beliefs, we can use them to instrument for beliefs.²⁹ Results are in Table 2 Panel A column 5 where we estimate that raising beliefs about compliance of the rich by one percentage point raises own compliance by 0.4 percentage points on average, significant at the 5% level. In general, given the small magnitude of effects in our first stage, the F-statistic is low (see foot of panel). We consider this exercise as more speculative, but still suggestive evidence of a “compliance trap”, where taxpayers are less inclined to pay when they believe others are not paying (Besley et al. 2022, Del Carpio 2022).

6.2.2 Indirect Effects: heterogeneity and sub-treatments

In addition to the preceding analysis of indirect effects, we explore heterogeneity in effects across baseline characteristics of properties, owners, and neighborhoods. Table A16 gives results and we find no evidence of heterogeneous indirect effects across any of the dimensions we consider (property value, owner’s total value, or local compliance rates at baseline). Further, we can never reject the null hypothesis that effects of Delinquent Lists are equal to effects of Complier Lists within terciles (top rows at foot of table).

We also look at sub-treatment effects by SMS message content (short list from city, short list from neighborhood, and link to full city list) and find no evidence that the indirect effects of public dissemination (Delinquent or Complier lists) vary by these sub treatments (see Appendix Table A17). For Complier lists, we also consider the third treatment arm that sent lists of compliers sampled only from the wealthiest (top 5%) property owners in the city. Our estimates are negative but with large standard errors and we can never reject that it zero, nor that it is different from the effect of receiving a list of random taxpayers. We may simply be underpowered to detect these effects.

²⁹Our evidence presented above suggests this is the case for observable measures and we also explore alternative channels in Section 7.1 below.

7 Discussion

7.1 Alternative explanations

7.1.1 Direct effects imply no shame in tax delinquency

We find average direct effects of public disclosure that are negative if disclosing delinquents and positive if recognizing compliers. Our explanation is that, on average, taxpayers aim to avoid a negative social payoff to their property ownership status being made public, and that there is no motivation from shame in delinquency or pride in compliance. Here, we explore three alternative explanations in order and highlight why our privacy cost explanation is preferred.

First, perhaps the public imposes costs on both those known as delinquents and those known as compliers relative to those whose compliance status is ambiguous. For instance, if the public is heterogeneous with some imposing pro-compliance social sanctions on those perceived as high probability delinquents and others imposing pro-delinquency social sanctions on those perceived as high probability compliers, then agents may wish to be perceived ambiguously to avoid social costs from either ‘camp’ in this polarized public. While theoretically possible, we do not find much evidence from our endline and follow-up surveys on social costs to being perceived as a complier: 93% of respondents in our endline survey believe that not paying property rates that are owed is wrong, while only 14% of respondents in our follow-up survey see any costs at all to being known publicly as a complier. As such, we see our simpler explanation as more likely.

Second, perhaps taxpayers interpret both messages as sending a signal about compliance rates in the city. Receiving a message that threatens reporting may suggest that non-compliance is rare, whilst promising recognition may suggest that compliance is rare. This would still suggest no shame costs on average, but provides an alternative explanation to privacy costs for what is driving direct effects. However, our follow-up survey suggests privacy costs are likely to be present, with 96% of respondents expressing perceived social costs to the public listing of property owners.

A third alternative is that some messages may be interpreted as favoritism if it is known that other people receive different messages. By receiving a message that promises recognition, taxpayers may feel favoured and thus less obligated to pay their taxes (and vice versa for reporting messages). This is possible - in our endline survey, 50% report discussing these messages with their neighbors. However, this would imply taxpayers trust this implicit signal above the content of the message and we did not hear any evidence of this interpretation in our follow-up survey. At the same time, a neighbor is not necessarily a rental property owner, and so most neighbors of respondents will not also have received a message. Finally, as discussed below, we do not find evidence of spatial spillovers suggesting that property owners are not comparing messages they

receive which would be necessary to infer that one is ‘favoured’ over others.

7.1.2 Indirect effects lower payments through compliance beliefs

We find average negative indirect effects of receiving either a list of delinquents or compliers. Our explanation is that these lists send a signal about the true compliance rate, which is far below baseline compliance beliefs, so taxpayers adjust their beliefs downwards and consequently comply at a lower rate. Here, we explore four key alternative explanations in order to highlight why our compliance beliefs explanation is preferred.

First, perhaps treatment messages caused taxpayers to believe the KCCA was acting unfairly, demotivating them from paying their rates and resulting in lower compliance. However, we have already seen in Table 2 Panel B column 5 that estimates of treatment effects on the belief that KCCA acts in the interest of its citizens are insignificant and small for Delinquent lists and insignificant but actually positive for Complier lists.

Second, perhaps treatment messages negatively signal the KCCA’s ability to detect who does and does not pay. Again, we saw Table 2 Panel B column 4 shows insignificant treatment effects on the belief that KCCA can detect who pays taxes. In addition, the standard message sends a strong signal of this legibility (all recipients are notified of their tax dues by name, regardless of treatment).

Third, it could be that receiving a delinquent list signals that enforcement is weak, and conventional penalties are rare, because they are resorting to ‘desperate’ public disclosure measures as enforcement. For example, taxpayers could think that taking taxpayers to court is costly, and therefore KCCA is resorting to public disclosure. While we cannot rule this explanation out, as enforcement beliefs were not measured at endline, we do not see any evidence to support this explanation in our follow-up survey. We see it as more likely that receiving a list providing information on (non)compliance would affect compliance beliefs, but it is possible that our indirect treatment effects work through enforcement beliefs in addition to compliance beliefs.

A fourth alternative explanation is simply that taxpayers misread the complier lists as a list of delinquents. However, it seems unlikely that the complier lists were the only message that were systematically misread. Also, the messages emphasized that the list was “recognising the contribution made by property owners who PAID” their taxes (see Appendix Table A3) and taxpayers would be familiar with government initiatives to recognize compliers.³⁰

³⁰e.g. there are similar efforts by the Uganda Revenue Authority to recognize taxpayers at the national level (see Appendix Figure A8).

7.2 External validity: “Structured speculation”

This section discusses the external validity of some of our key results. We follow Banerjee et al. (2017) to provide “structured speculation” on how our results may differ when our intervention is scaled up, when treatments are assigned to a different population, and when treatments are assigned to the same population but in different circumstances. In doing so we aim to make precise speculations that apply our practical knowledge built in the field and are falsifiable by future research.

7.2.1 How scalable is the intervention?

The intervention in this paper is effectively implemented at scale (for all of Kampala), but we randomize a variety of treatments at the property owner level and so physical or social ‘neighbors’ may receive differing treatments. If the intervention was scaled up as a uniform treatment then results may differ for at least two reasons.

The first is the potential presence of spillovers and violation of SUTVA. In theory, if there were spillovers across treatment groups we might worry about different results if a uniform treatment was rolled out across the city. Recent work in Austria found that enforcement letters sent to TV license delinquents not only raised compliance of treated individuals, but also for neighbors within 50m (Drago et al. 2020). In Appendix Table A13, we present ‘spillover tests’ for wave one where we include the shares of neighbors within 50m of a property that received a ‘benchmark’, ‘reporting’, and ‘recognition’ message. Having more neighbors with a reporting or recognition message does not have a significant effect on compliance. Further, the treatment effect estimates are very stable after the inclusion of these controls compared to the main estimates in Table 1 Panel A. A similar conclusion can be reached for indirect effects in wave two by examining Table A19.

A more pertinent issue is that we purposefully designed our study to minimize the chance of spillovers, e.g. by targeting the treatments privately to individuals. This limited our ability to conduct a more conventional campaign using newspaper, radio, and dissemination by word of mouth. If this intervention was implemented by another actor, such as the city government, they would not face this concern. Therefore they could initiate much more salient information campaigns than we were able to. For instance, the Ugandan Revenue Authority conducts a highly publicized version of public disclosure of income taxpayers (see Appendix Figure A8).

For this latter reason, a uniform scaling of our intervention is likely to be more salient. We would speculate that all of our treatment effects, both endline one and endline two, would be of larger magnitude in such a case (analogous to a scaling up of θ in section 5).

7.2.2 Results in a different population?

This study was conducted on rental property owners in Kampala Uganda. Results may differ if implemented for a different geographical location, or tax base.

Our speculation is that a defining feature of our population is the low baseline level of compliance. As discussed in Besley et al. (2022), social motivations to pay tax may be endogenous to the level of compliance. Therefore, the shame mechanism in our framework may be stronger in contexts where baseline compliance rates are high. In such contexts of high compliance, we expect (direct) reporting and recognition effects to both be more positive. We did explore this within our population using heterogeneity analysis, but we cannot detect any differences in treatment effects between bottom, middle, and top terciles of baseline compliance rates (see Appendix Table A10 columns 3 and 4). A key issue is that we do not observe any local areas with high absolute levels of compliance at baseline, e.g. the 95th percentile village compliance rate is only 29%. In addition, we speculate that a context with much higher baseline compliance would have less room for initially optimistic taxpayers to be demotivated by reports of delinquents, and so the indirect effects would likely be more positive than they are in our context. However, this would obviously also depend on the prior beliefs of the taxpayers.

Another important feature of our population is that the city government is generally seen unfavourably. There are multiple reasons, but three common themes from focus groups and follow-up interviews are that there is under-provision of public services, issues with the property valuation process, and poor sensitization of property tax procedures. For instance, follow-up respondent #21509 explains: “KCCA is like a bottomless pit ... paying taxes taxes taxes but what is there to show? ... most of the communities do things for themselves”. Our speculation is that this diminishes the social motivation to pay by providing delinquents an excuse that taxes are not put to a socially productive use. Respondent #21509 explains: “To be proud of your tax payment means getting back benefits from the people you paid taxes to. ... but here you pay and you are not getting anything”. So if our treatments were assigned in a population with higher perceived productive state capacity, we would expect our direct effects to be more positive.

Finally, we would expect similar privacy and shame effects to be at play when using public disclosure policies on other types of taxpayers e.g. when disclosing income or wealth tax payments. However, a distinctive feature of property taxes is that the tax base is highly observable. The government knows what is owed by each property and can easily identify delinquents and compliers. This is different from other tax bases, like personal income, where liability is more difficult to observe. Effectively this means that in other contexts, reporting and recognition effects can operate through an additional ‘whistle blower’ channel. Upon publicly disclosing tax payments, a third party can inform the government that a particular individual’s reported income is less than their true

income. Our speculation is that our direct treatment effects on a tax base that is less observable would be more positive due to the additional whistle blower channel. This is one important dimension that our context differs from Slemrod et al. (2022) who study public disclosure of self-employed income taxpayers in Pakistan.

7.2.3 Results in the same population in different circumstances?

In this paper we study public disclosure of property taxpayers over the course of one year without repetition. If the program was implemented repeatedly over time, or under different circumstances, our results may differ.

We speculate that treatment effects would attenuate towards zero over time if they were implemented on a repeated basis. First, consider a tax delinquent who gets reported in the first year. Once reported, the government has less leverage over them as it becomes increasingly likely over time that the privacy costs have already been incurred. Equivalently, the effect of recognition will become less negative. So, direct effects should attenuate over time. Second, consider a taxpayer who receives a delinquent or complier list and updates their beliefs about the compliance of others downwards. Over time, these beliefs will converge, i.e. taxpayers will be sufficiently pessimistic about compliance that they will no longer update. Again, this would mean that indirect effects tend towards zero overtime. Finally, a similar argument can be made about the benchmark enforcement message. This treatment may remind taxpayers of the legal enforcement actions that the government can take, but its effectiveness is likely to decline unless actual enforcement is increased and perceived by taxpayers.

Finally, our experimental interventions were conducted in 2021, the year following the COVID pandemic. Importantly, the city government put out a waiver on late payment penalties during the year 2020. This may have temporarily lowered taxpayers' social motivation to pay because it became more acceptable to be delinquent. As discussed in section 7.2.2 we believe that there are more fundamental reasons for limited social motivation to pay, and that the relative effect of the pandemic on social motivations was limited. However, it is possible that if our intervention was implemented in a later year then our reporting and recognition treatment effects would be more positive due to this temporary decrease in social motivations passing over time.

7.3 Policy Implications

Our study has important implications for policy makers in looking to raise property tax compliance in low-income settings like Kampala. There are three main takeaways for policymakers.

First, public disclosure policies in such a context seem to have, at best, limited effects on compliance, and at worst may even reduce tax compliance. The small positive direct

effect of publicly reporting delinquents was counterbalanced by a negative indirect effect of disseminating information about these delinquents. Assuming that the average policy effect can be calculated as the sum of direct and indirect average effects, this gives a very small and negative (-0.075 percentage point) total effect on tax compliance. Even worse, recognition of compliant taxpayers completely backfires, with both direct and indirect effects of recognition reducing tax compliance. The average policy effect of recognition is a relatively large negative effect on compliance (-1.33 percentage points). We recommend against public disclosure policies in similar contexts.

Second, standard reminders about the legal enforcement ability of the government can raise compliance by about 1.3 percentage points. This is over twice the size of the estimated direct effect of reporting, i.e. even before accounting for the negative indirect effects. These simple enforcement messages represent a relatively more effective policy tool than public disclosure. Taking our 0.019 estimate of the enforcement message effect on the share of liability paid, and noting that the average liability is 290k UGX, enforcement messages raise about 5,500 UGX per property compared to simple reminders at no additional cost.³¹ We emphasize however, that despite the relative cost effectiveness of enforcement messages, their absolute magnitude is still very small compared to the overall compliance gap. Such ‘nudges’ are very unlikely to make a substantial difference to compliance rates in low capacity settings.

Finally, our study suggests that SMS can be an effective tool for policy communication. Taxpayers are reachable by phone: we called 8,525 taxpayers for our endline survey and of the 6,303 taxpayers that we were able to reach by phone, 87% had correct phone numbers according to the KCCA database. The majority (88%) of our endline survey respondents recall receiving a message from KCCA regarding property rate compliance at some point in the study year. At the same time, even simple reminder messages appear to have a significant impact on payments. While we did not create a randomly assigned group of property owners to receive no reminders, we can look at payments over time in the style of an event study before and after our intervention starts. Appendix Figure A9 shows striking increases in control group payment propensities right at the first intervention week that remain elevated throughout the treatment period.

8 Conclusion

Our study investigates the impact of public disclosure policies on property tax compliance in a low-income, low-compliance setting through a field experiment with the Kampala Capital City Authority.

We find evidence of positive direct effects of reporting, whereby those warned are

³¹By contrast, other types of information messages (reciprocity or city contact details) have no effect on compliance. We explore this further in (Ahabwe et al. 2023).

more likely to pay their taxes, but negative indirect effects on those who are informed. On public recognition, however, we find both negative direct effects and indirect effects. We investigate these effects further to better understand the underlying mechanisms. We find that the positive direct effects of public reporting are similar in magnitude but of opposite sign to the direct effects of public recognition. Using a parsimonious model, we show that this can be explained by a privacy cost to being revealed as a property owner, and no shame cost to tax delinquency nor social gain to compliance. Further, we provide evidence that public disclosure policies induce negative indirect effects by updating taxpayers' beliefs about general compliance downward.

Why is it that public disclosure has such limited effects on tax compliance in this context? We speculate that in a context of low compliance and low service provision, payment of taxes does not gain social esteem, resulting in limited shame of delinquency. At the same time, public disclosure would be more effective in a context of high compliance, where disseminating information raises taxpayers beliefs about compliance.

The findings of our field experiment shed light on options for future policy. It seems that public disclosure policies are not effective at raising compliance in this context; instead, a simple message communicating potential enforcement measures is a cost-effective way of raising compliance by at least as much as the threat of public reporting.

With the above in mind, it is important to note that the cost-effectiveness of nudge policies comes largely from the fact that they are so cheap, and not because they are particularly effective. In the context of property tax collection in sub-Saharan Africa where compliance rates are extremely low, more ambitious policies are needed in order to reach high levels of tax compliance. This remains an important avenue for future research.

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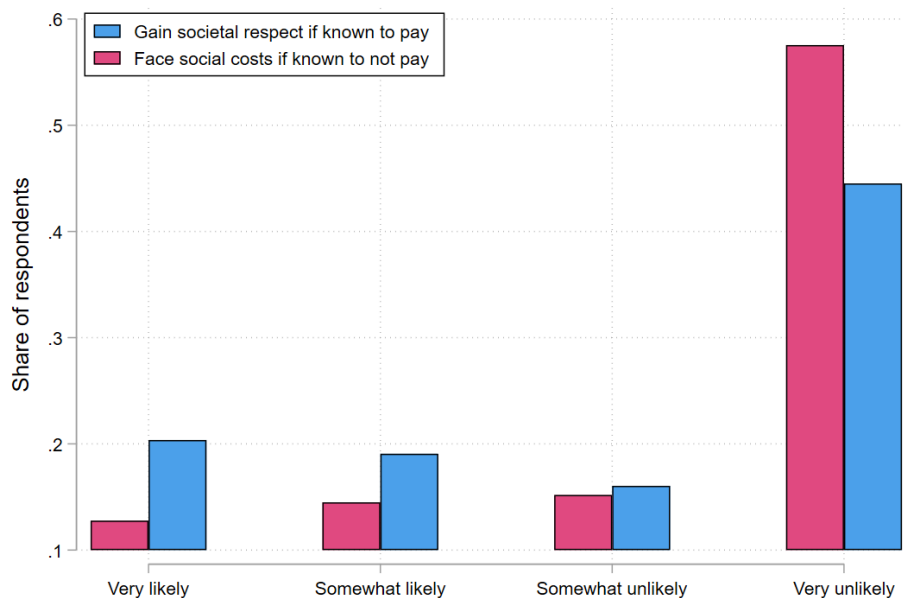
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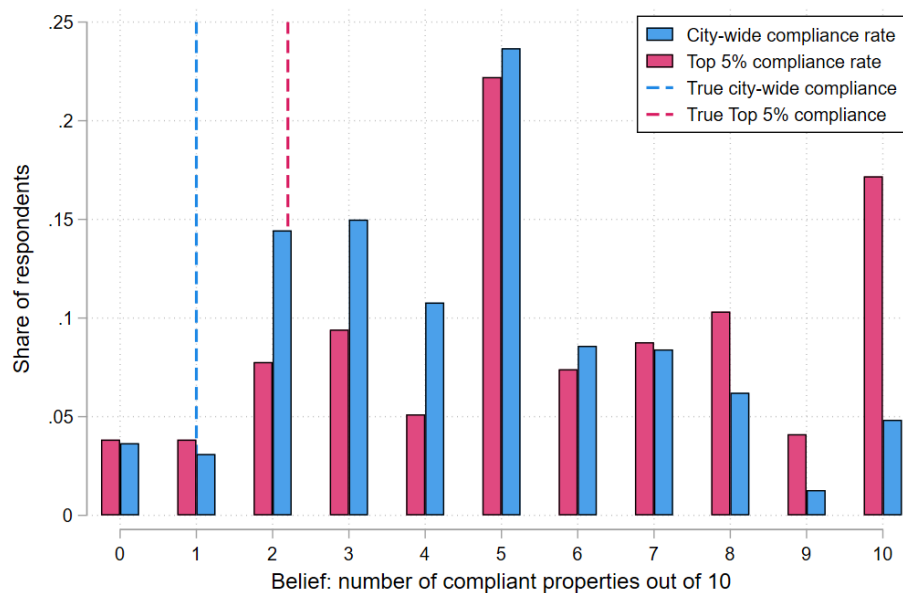
Figures

Figure 1: Baseline Norms and Beliefs

(a) Perceived norms on compliance and delinquency



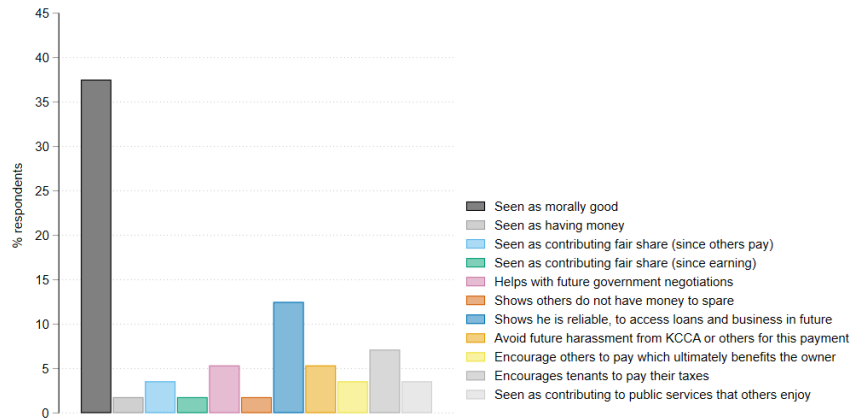
(b) Beliefs about the compliance rate



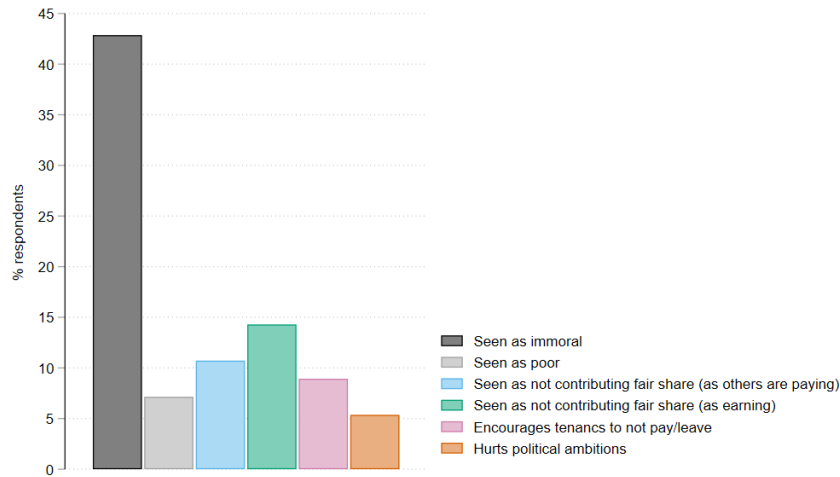
Notes: This figure plots responses from the baseline survey of property owners. Panel a plots the share of respondents with different stated norms of social gains from compliance (blue bars) and social costs to delinquency (red bars) from 1,159 respondents who gave an answer to both questions. Panel b plots histograms for beliefs of the compliance rate across all properties city-wide (blue bars) and across all wealthy (top 5% by value) property owners (red bars) from 1,094 respondents that gave an answer to both questions. The dashed blue line gives the true compliance rate in the city, the dashed red line gives the true compliance rate for the wealthy property owners.

Figure 2: Follow-up survey: perceived costs and benefits of public disclosure

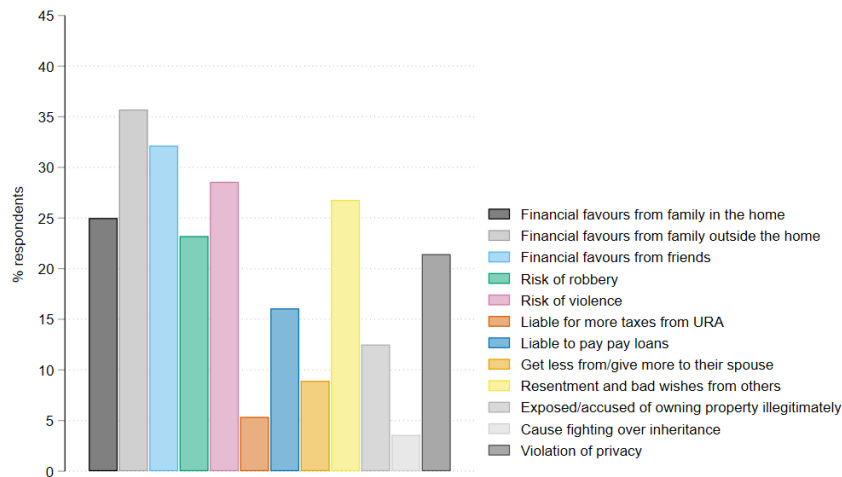
(a) What gains would be incurred if compliance is made public?



(b) What costs would be incurred if delinquency is made public?



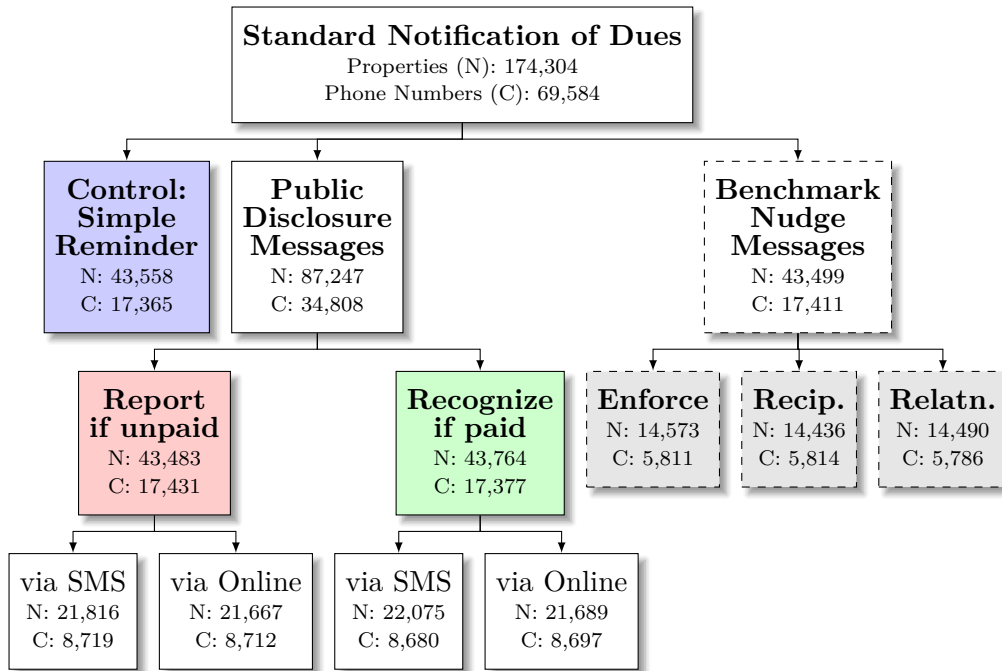
(c) What costs would be incurred if ownership is made public?



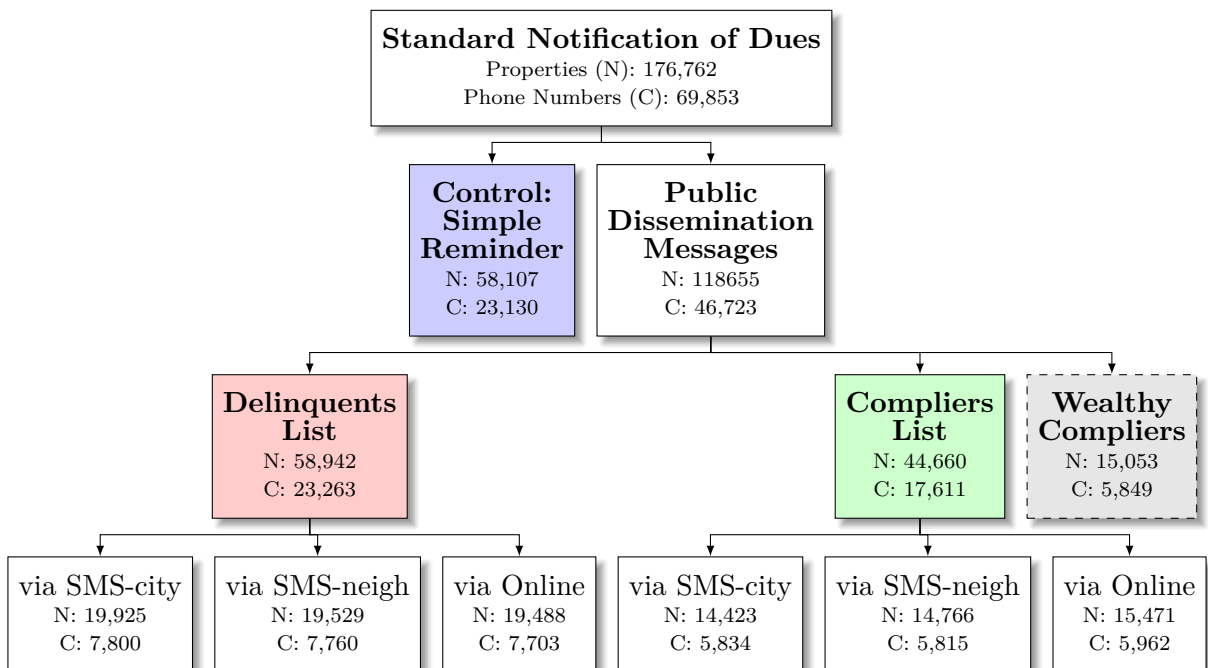
Notes: This Figure plots responses from our follow-up survey. Responses are not mutually exclusive. Respondents were asked about gains to compliance being made public (panel a), costs to delinquency being made public (panel b), and costs to ownership being made public (panel c).

Figure 3: Treatment group diagrams

(a) Treatment groups in first wave (direct effects)



(b) Treatment groups in second wave (indirect effects)



Notes: This figure depicts the assignment of properties and property owners to the control and treatment groups from the first wave (panel a) and second wave (panel b). The number of properties in each group is denoted N and the number of phone number clusters, the level of randomization, is denoted C.

Tables

Table 1: Direct and Indirect treatment effects on compliance outcomes

	(1)	(2)	(3)
	Paid Liability (pp)	Any Payment (pp)	Share Liability Paid (pp)
<i>Panel A: Direct effects from wave one</i>			
<u>Public disclosure effects</u>			
Reporting (τ_S)	0.579 (0.218)	0.816 (0.251)	1.003 (0.200)
Recognition (τ_H)	-0.551 (0.193)	-0.786 (0.213)	-1.056 (0.200)
<u>Benchmark effects</u>			
Enforcement	1.290 (0.316)	1.509 (0.353)	1.911 (0.282)
Reciprocity	-0.0674 (0.311)	-0.0455 (0.343)	-0.159 (0.283)
Relationship	-0.503 (0.274)	-0.520 (0.317)	-0.595 (0.283)
p-value ($\tau_S + \tau_H = 0$)	0.94	0.94	0.88
Control Mean	3.4	4.2	5.4
<i>Panel B: Indirect effects from wave two</i>			
Delinquent List (κ_S)	-0.654 (0.176)	-0.880 (0.220)	-1.314 (0.330)
Complier List (κ_H)	-0.782 (0.185)	-0.810 (0.257)	-1.309 (0.355)
p-value ($\kappa_S = \kappa_H$)	0.44	0.77	0.99
Control Mean	3.1	4.6	5.9

Note: Panel A shows estimates of direct effects on compliance at the wave one endline (may-june 2021), and Panel B shows estimates of indirect effects on compliance at the wave two endline (nov-dec 2021). The sample for panel A is 174304 properties and 69584 property owner clusters from the wave one endline. The sample for panel B is 161709 properties and 64004 property owner clusters from the wave two endline (we exclude 15053 properties in the wealthy compliers treatment to keep the treatment groups compositionally similar). All outcomes are scaled to be interpreted as percentage points, and full definitions are given in Appendix Tables A4 and A6. Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level.

Table 2: Indirect effects on compliance and beliefs in endline survey sample

<i>Panel A: Effects on compliance beliefs and IV</i>					
	OLS				2SLS
	(1)	(2)	(3)	(4)	(5)
	Paid Liability (pp)	All Kampala Comply (pp)	Rich Kampala Comply (pp)	Own Village Comply (pp)	Paid Liability (pp)
Delinquent List	-1.69 (0.66)	-2.29 (1.16)	-4.59 (1.54)	-0.57 (1.22)	
Complier List	-1.79 (0.74)	-1.58 (1.26)	-3.52 (1.56)	1.25 (1.33)	
Belief Rich					0.42 (0.20)
F stat (K&P)					9.81
Control Mean	4.4	52.6	62.2	34.0	4.4
<i>Panel B: Effects on alternative beliefs with multiple hypothesis corrections</i>					
	(1)	(2)	(3)	(4)	(5)
	All Kampala Comply (pp)	Rich Kampala Comply (pp)	Own Village Comply (pp)	KCCA Detection Capacity (pp)	KCCA Acts in Best Interest (pp)
Delinquent List	-2.29 (1.16) [0.05] {0.15}	-4.59 (1.54) [0.00] {0.03}	-0.57 (1.22) [0.64] {1.00}	-1.73 (1.65) [0.30] {0.67}	-0.31 (2.43) [0.90] {1.00}
Complier List	-1.58 (1.26) [0.21] {0.57}	-3.52 (1.56) [0.02] {0.12}	1.25 (1.33) [0.35] {0.67}	-0.13 (1.94) [0.95] {1.00}	2.14 (2.55) [0.40] {0.67}
Control Mean	52.6	62.2	34.0	87.0	45.5

Note: The sample for all specifications is 7230 properties and 3458 property owner clusters from the endline survey. All outcomes are scaled to be interpreted as percentage points, and full definitions are given in Appendix Tables A4 and A6. Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level. Panel A columns 1-4 are OLS estimates of treatment effects, and column 5 is IV/2SLS results for the effect of beliefs about compliance of the rich, instrumented with a dummy equal to 1 if either a delinquents or compliers list was randomly assigned. The Kleibergen-Paap F-statistic is reported at the bottom of the panel. Panel B columns are OLS estimates of treatment effects on a set of alternative belief outcomes. In addition, standard p-values for the null hypothesis that the treatment effect is zero are given in square brackets, and sharpened q-values adjusting for the False Discovery Rate are given in curly brackets.

Appendices for Public Disclosure and Tax Compliance: Evidence from Uganda

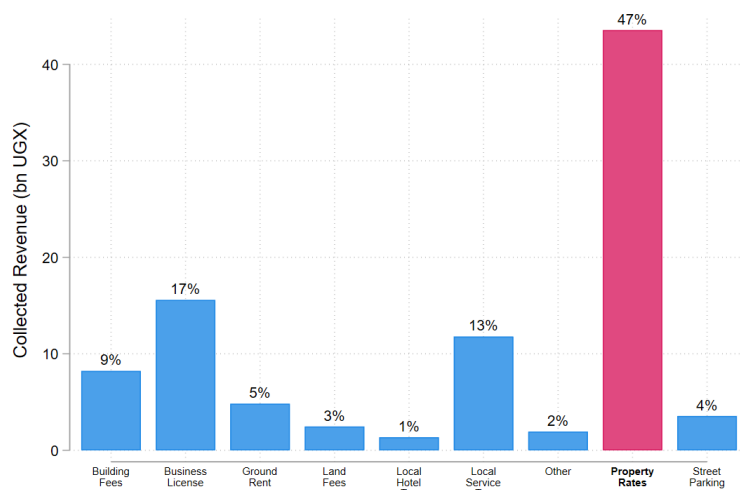
Priya Manwaring & Tanner Regan

December 23, 2024

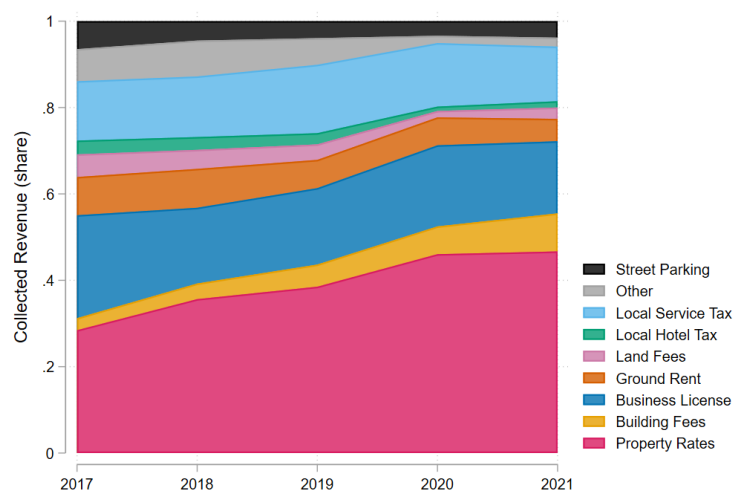
A Appendix Figures

Figure A1: KCCA Own-Source Revenues by Collection Instrument

(a) Collected Revenues in 2021

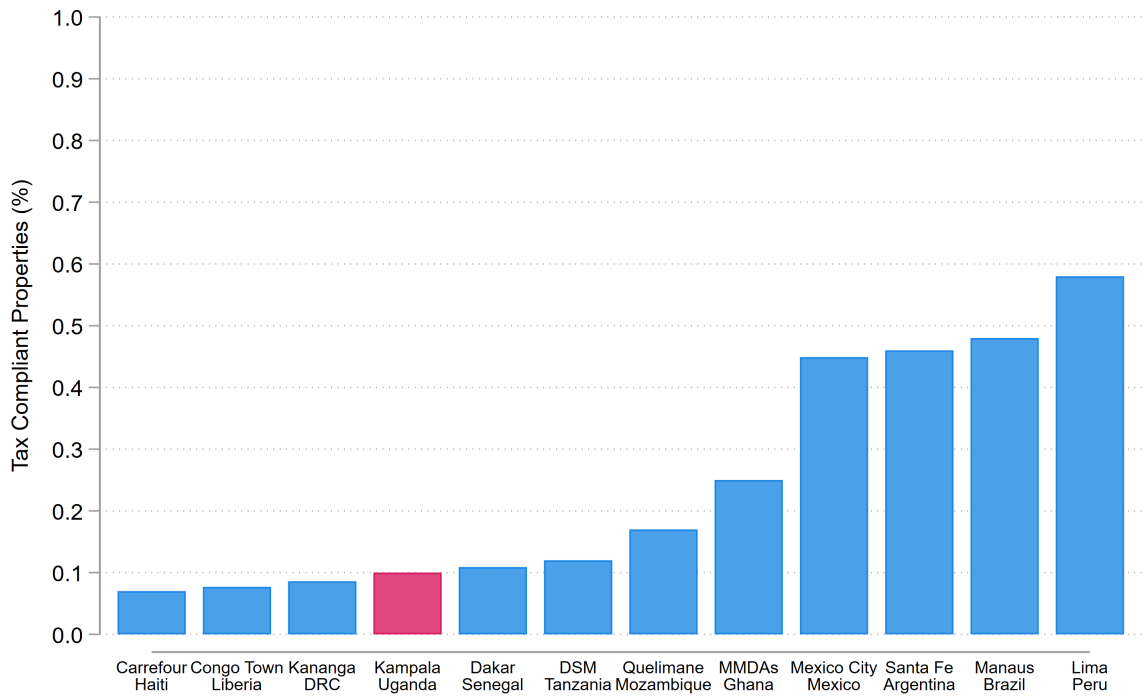


(b) Revenue Share by Instrument 2017-2021



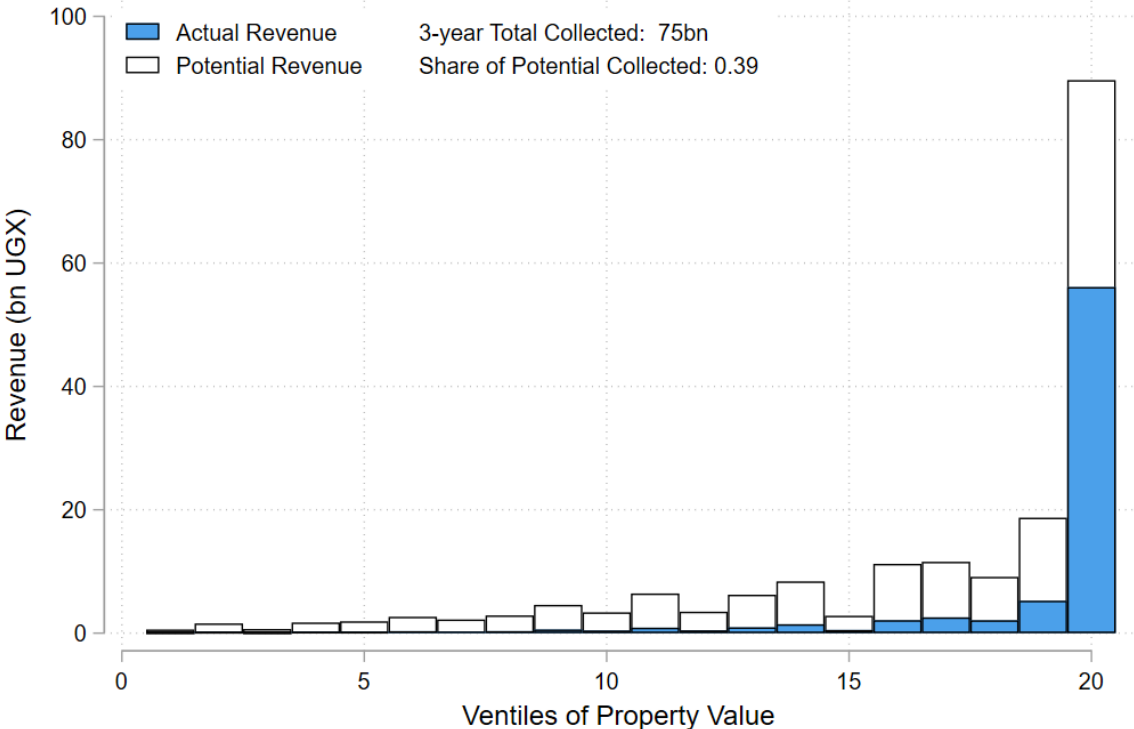
Notes: This figure plots distributions of own-source revenue collection by the Kampala Capital City authority. Panel (a) plots collected revenue in the financial year 2021/22 by collection instrument. Panel (b) plots revenue share from a select set of instruments over the period 2017/18-2021/22.

Figure A2: Property Tax Compliance Rates Across Countries



Notes: This figure plots property tax compliance rates from cities around the world. Estimates are taken from studies of property taxes in low- and middle- income countries where available. The cities or regions include: Carrefour, Haiti (Krause 2020); Cong Town, Liberia (Okunogbe 2019); Kananga, DRC (Bergeron et al. 2019); Kampala, Uganda (this paper); Dakar, Senegal (Cogneau et al. 2020); Dar es Salaam, Tanzania (Collin et al. 2021); Quelimane, Mozambique [self reported compliance] (Sandholtz & Vicente 2024); MMDAs in Ghana (Dzansi et al. 2020); Mexico City, Mexico (Brockmeyer et al. 2023); Santa Fe, Argentina (Castro & Scartascini 2015); Manaus, Brazil (Best et al. 2019); and Lima, Peru (Del Carpio 2022).

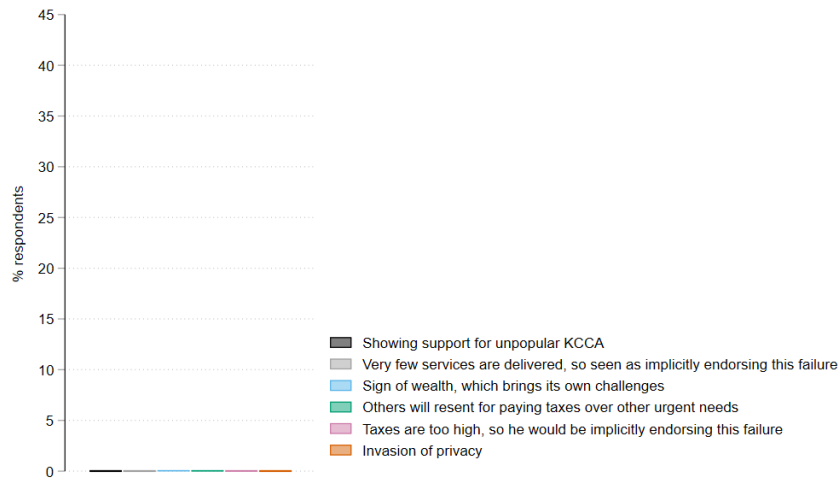
Figure A3: Actual and Potential Revenue Collection vs. Property Value



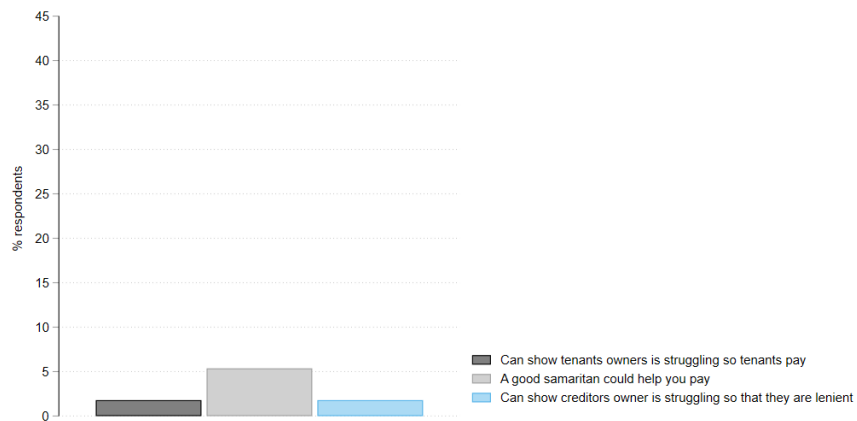
Notes: This Figure plots actual and potential revenue collection by ventiles of property value. Revenue is calculated over three financial years: 2019/20, 2020/2021, and 2021/22. Actual revenue includes all payments: liabilities, interest, and penalties. Potential revenue is calculated as three years of annual liability.

Figure A4: Follow-up survey: (additional) perceived costs and benefits of public disclosure

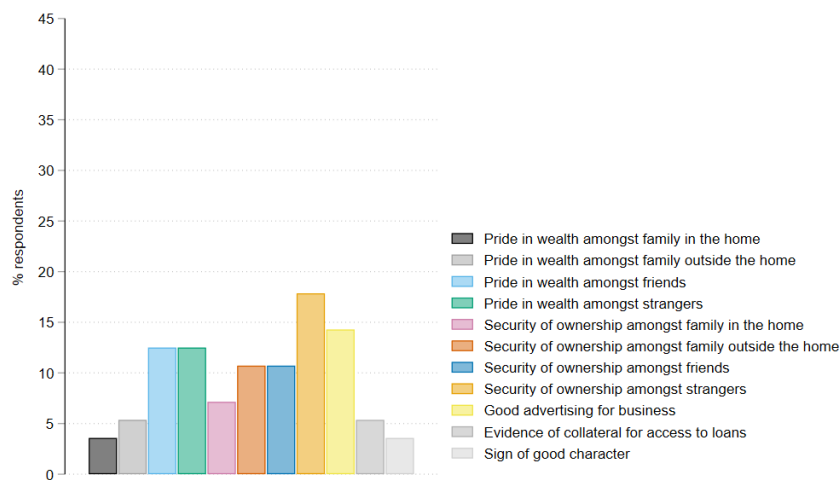
(a) What costs would be incurred if compliance is made public?



(b) What gains would be incurred if delinquency is made public?

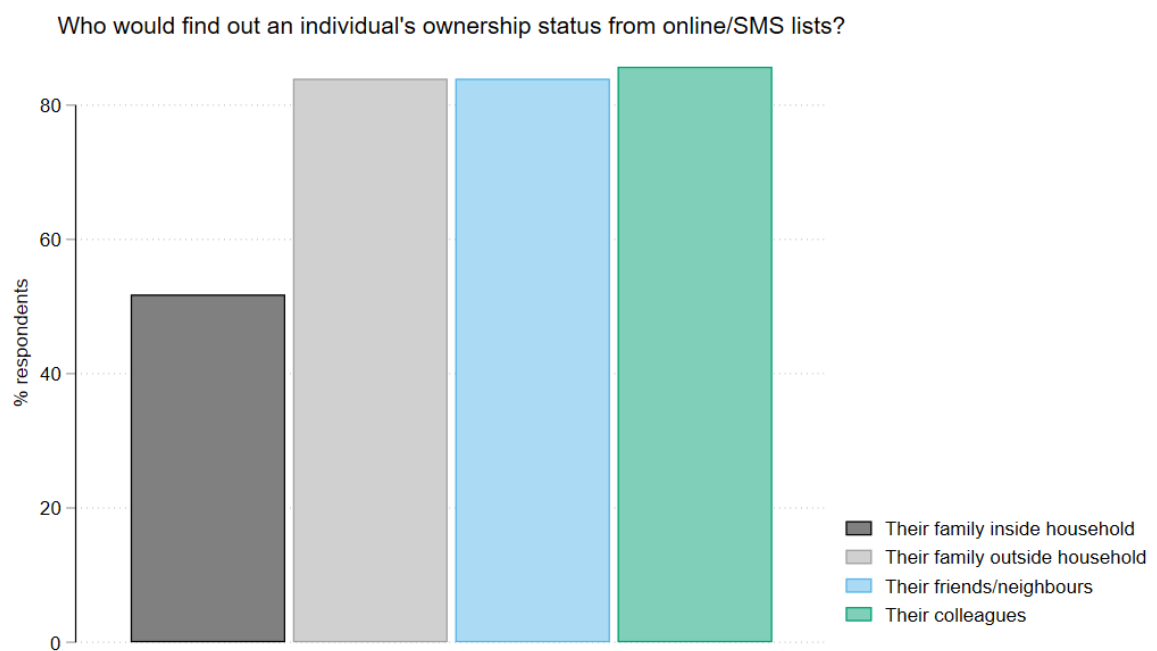


(c) What gains would be incurred if ownership is made public?



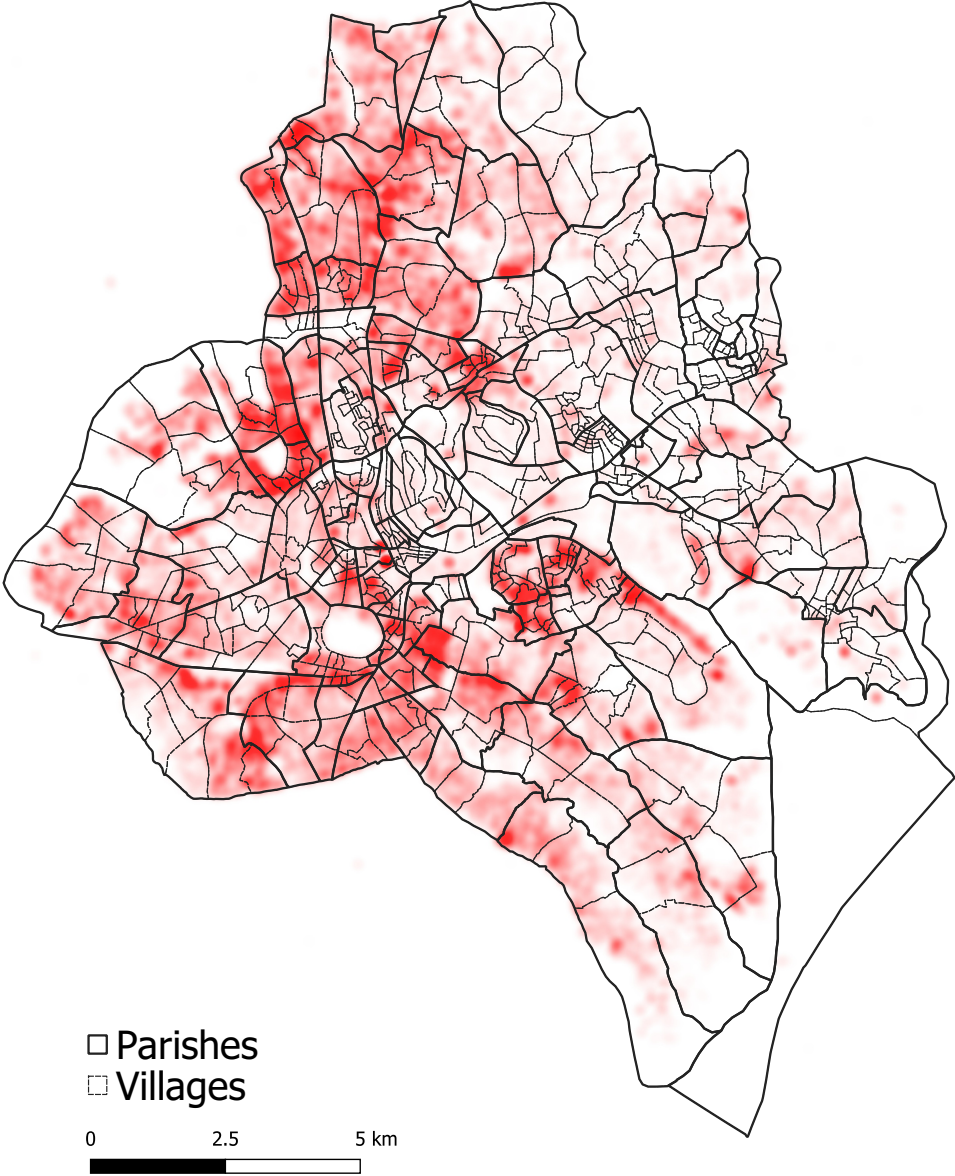
Notes: This Figure plots responses from our follow-up survey. Responses are not mutually exclusive. Respondents were asked about costs to compliance being made public (panel a), gains to delinquency being made public (panel b), and gains to ownership being made public (panel c).

Figure A5: Follow up survey: from whom is property ownership kept private?



Notes: This Figure plots survey responses to the question “To whom would publishing [a list of property owners] reveal that [hypothetical person] is a property owner?”, from our follow-up survey. This was asked to all respondents who answered “yes” to “Do you think publishing these lists would reveal to any of [hypothetical person]’s friends, family or wider social network that they are a property owner (i.e. they would find this out for the first time)?”

Figure A6: Taxable Properties (density) and village and parish boundaries in Kampala



Notes: This Figure plots the density of taxable properties and village and parish boundaries in Kampala. Darker areas represent higher taxable property density.

Figure A7: Screenshots of the online KCCA ‘honoring’ and ‘reporting’ webpages’



Notes: This Figure shows screenshots from the official KCCA webpage. The top image is the page that is sent to the Online Recognition treatment group in public dissemination (indirect effects in wave 2), and the bottom image is the page sent to the Online Reporting treatment group in public dissemination (indirect effects in wave 2).

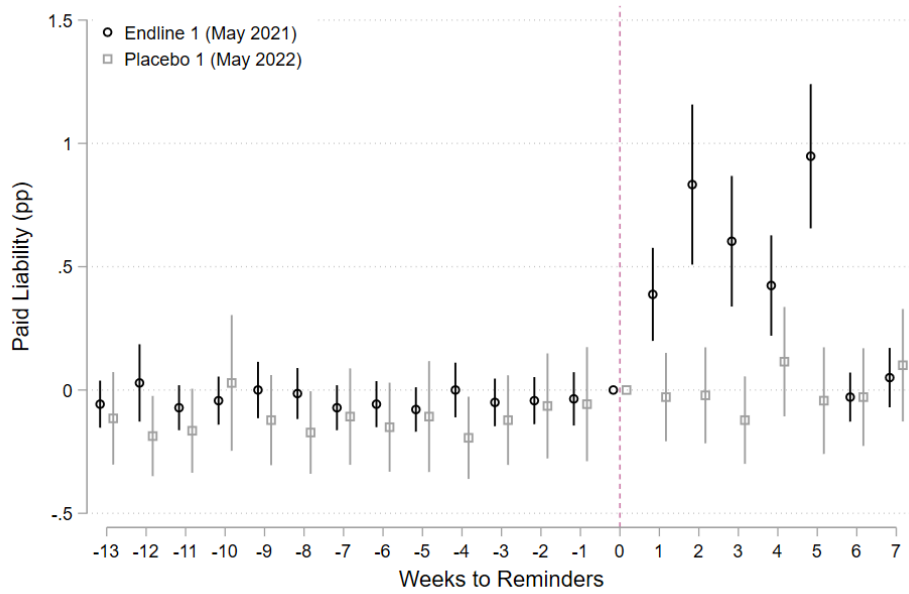
Figure A8: An example of a related intervention conducted by URA



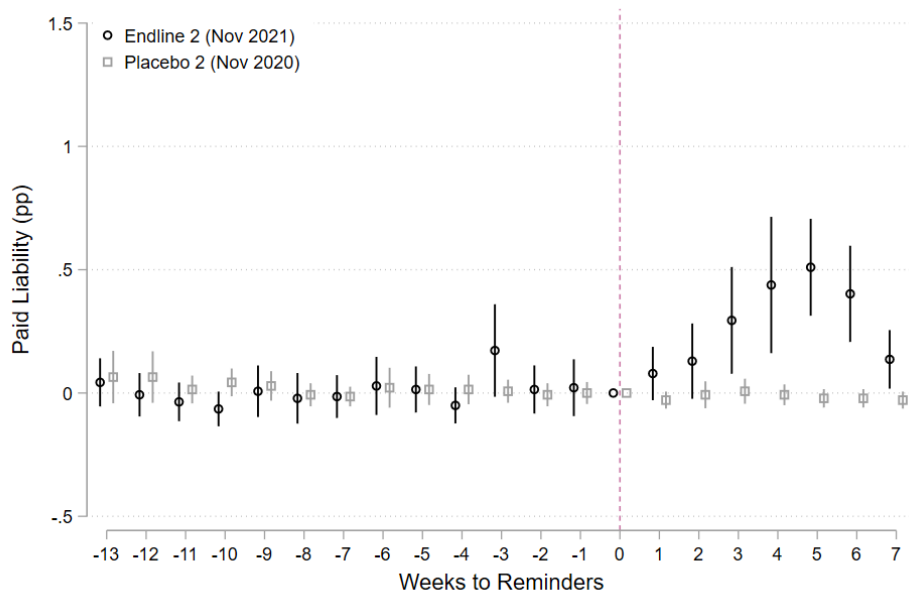
Notes: This Figure shows a flyer from a related public disclosure campaign conducted by the Ugandan Revenue Authority. Such flyers were not used in this study.

Figure A9: Event studies SMS reminder effects and placebos

(a) June payment deadline (wave one)



(b) December payment deadline (wave two)



Notes: This figure plots the share of properties paying their liability by week leading up to payment deadlines. Only properties that were in the control group for both wave one and two are included. Panel A focuses on the June deadline, and panel B the December deadline. The vertical red line represents the date at which the intervention started sending reminder messages. The black dots represent years in which the intervention took place, and grey dots are ‘placebo’ years where the intervention did not take place.

B Appendix Tables

Table A1: Timeline of Study

Date	Activity	Messages sent (per language)
<i>Baseline Survey, 2020</i>		
Nov-Dec	In-person baseline Survey conducted by a private surveying company with 1,172 property owners	N/A
<i>Events During First Wave of Experiment, 2021</i>		
14 May	Colleagues at KCCA generated list of all properties and balances as of this date	N/A
17 May	Standard messages sent - one for each property that had an outstanding liability	174,617
18 May	Control and treatment messages sent - one for each phone number against which there was an outstanding liability (i.e. among any of the properties listed as owned by someone with this phone number)	70,381
21 May	Colleagues at KCCA generated list of all properties and balances as of this date	N/A
24 May	Control and treatment messages sent - one for each phone number against which there was an outstanding liability (i.e. among any of the properties listed as owned by someone with this phone number)	69,238
11 June	Colleagues at KCCA generated list of all properties and balances as of this date	N/A
14 June	Standard messages sent - one for each property that had an outstanding liability	170,942
15 June	Control and treatment messages sent - one for each phone number against which there was an outstanding liability (i.e. among any of the properties listed as owned by someone with this phone number)	76,902
<i>Events During Second Wave of Experiment, 2021</i>		
17 Nov	Colleagues at KCCA generated list of all properties and balances as of this date	N/A
18-19 Nov	Standard messages sent - one for each property that had an outstanding liability	176,126
19-22 Nov	Control and treatment messages sent - one for each phone number against which there was an outstanding liability (i.e. among any of the properties listed as owned by someone with this phone number)	69,186
2 Dec	Colleagues at KCCA generated list of all properties and balances as of this date	N/A
3 Dec	Control and treatment messages sent - one for each phone number against which there was an outstanding liability (i.e. among any of the properties listed as owned by someone with this phone number)	69,054
13 Dec	Colleagues at KCCA generated list of all properties and balances as of this date	N/A
14 Dec	Standard messages sent - one for each property that had an outstanding liability	173,566
15 Dec	Control and treatment messages sent - one for each phone number against which there was an outstanding liability (i.e. among any of the properties listed as owned by someone with this phone number)	68,520
<i>Endline Survey, 2022</i>		
Jan -Feb	Endline Survey conducted by a private surveying company over the phone with 4,960 property owners.	N/A
<i>Follow-up Survey, 2024</i>		
April	Follow-up Survey conducted by PI in person with 56 property owners.	N/A

Table A2: Content of ‘Direct Effects’ messages sent in wave one

Message	English Text	Luganda Text
Standard	Please pay UGX [liability] as overdue property rates balance for [propertyno] in the next 6 weeks. For details visit [Division] Division or call [KCCA phone contact]. Thank you KCCA	Nyabo/Sebo, osabibwa okusasula [liability] sente zobusulu bw'amayumba ezirudde enyo okusasulwa nga za [propertyno] mu sande 6 ezijja. Ebisingawo genda ku [Division] oba kuba essimu [KCCA phone contact]. Webale nyo. KCCA
Control	Dear [customername], Please remember to pay your overdue property rates in the next 6/5/2 weeks. Thank you KCCA	[customername], jjukira okusasula sente zobusuulu bw'amayumba ezirudde enyo mu sande 6/5/2 ezijja. Webale nyo. KCCA
Benchmark Enforcement	Dear [customername], If you do not pay your property rates, KCCA will implement enforcement measures (including fines and legal action) to recover this amount. Thank you KCCA	[customername], bw'otosasule sente z'obusuulu bw'enyumba yo, KCCA ejja kwongeramu amaanyi ng'ekozesa (omutango n'embuga z'amateeka) okkusobozesa okuzisasula. Webale nyo. KCCA
Benchmark Reciprocity	Dear [customername], Paying property rates makes it possible for KCCA to fund roads, drainage, street lighting and other essential services. Pay your taxes for a better city. Thank you KCCA	[customername], okusasula obusuulu bw'amayumba kisobozesa KCCA okukola enguudo, emyaala, amataala g'okunguudo n'obuwereza obw'enkizo obulala. Sasula emisolo gyo kulw'ekibuga ekisingako. Webale nyo. KCCA
Benchmark Relationship	Dear [customername], KCCA assigns a client relationship manager (CRM) for every taxpayer to address any query. Please contact your CRM with any issues: [arm_name] [arm_contact]. Thank you KCCA	[customername], KCCA yatongoza Maneja akola ku buli kwemulugunya kw'omusasuzi w'omusolo. Okubirizibwa okumwebuzaako singa oba n'ensonga yonna: [arm_name] [arm_contact]. Webale nyo. KCCA
Reporting SMS	Dear [customername], If you do not pay your property rates within 6/5/2 weeks KCCA will REPORT you as a DEFAULTER and share your name and parish in an SMS to fellow citizens and neighbours. Thank you KCCA	[customername], bw'otosasule sente z'obusuulu bw'anyumbayo mu sande 6/5/2, KCCA ejjakutwala nga alededdwa okusasula era ejjakusasaanya erinya lyo n'omuluka gwo eri batuuze banno nebaliranwa bo. Webale nyo. KCCA
Reporting Web	Dear [customername], If you do not pay your property rates within 6/5/2 weeks KCCA will REPORT you as a DEFAULTER and share your name and parish on kcca.go.ug/reporting-citizens. Thank you KCCA	[customername], bw'otosasule sente z'obusuulu bw'anyumbayo mu sande 6/5/2, KCCA ejjakutwala nga alededdwa okusasula era esasaanye erinya lyo n'omuluka gwo ku mukutu kcca.go.ug/reporting-citizens. Webale nyo. KCCA
Recognition SMS	Dear [customername], If you pay your property rates within 6/5/2 weeks KCCA will RECOGNISE your CONTRIBUTION by sharing your name and parish in an SMS to fellow citizens and neighbours. Thank you KCCA	[customername], bw'onosasule sente z'obusuulu bw'anyumbayo mu sande 6/5/2, KCCA ejjakwenyumiriza mu busasuzi bwo nga esasaanya erinya lyo n'omuluka gwo nga ekozesa obubaka obufunze eri batuuze banno nebaliranwa bo. Webale nyo. KCCA
Recognition Web	Dear [customername], If you pay your property rates within 6/5/2 weeks KCCA will RECOGNISE your CONTRIBUTION by posting your name and parish publicly on kcca.go.ug/honouring-citizens. Thank you KCCA	[customername], bw'onosasule sente z'obusuulu bw'anyumbayo mu sande 6/5/2, KCCA ejjakwenyumiriza mu busasuzi bwo ng'eteeka erinnya lyo n'omuluka gwo mu lujjudde ku mukutu kcca.go.ug/honouring-citizens. Webale nyo. KCCA
Recognition SMS (alternate)	Dear [customername], Thank you for paying your property rates. KCCA will RECOGNISE your CONTRIBUTION by sharing your name and parish in an SMS to fellow citizens and neighbours. Thank you KCCA	[customername], webale nyo okusasula sente z'obusuulu bw'amayumba. KCCA ejjakwenyumiriza mu busasuzi bwo nga esasaanya erinya lyo n'omuluka gwo nga ekozesa obubaka obufunze eri batuuze banno ne baliranwabo. Webale nyo. KCCA

Table A3: Content of ‘Indirect Effects’ messages sent in wave two

Message	English Text	Luganda Text
Standard	Dear [customer name], Please pay UGX [balance] as property rates balance for [property no] by Dec 31. For details visit [division] Division or call your account manager: [arm_contact]. Thank you, KCCA	[Customer name], Osabibwa okusasula UGX [balance] z’ekizimbe kyo namba [property no] ezaasigalayo obutasukka 31 Dec. Bwewabaawo ekyebuuzibwa, tuukirira ekitebe kyaffe e [division] Division oba kubira staff waffe ku ssimu [arm_contact] Weebale nyo. KCCA.
Control	Dear [customer name], Please remember to pay your property rates by Dec 31. Thank you KCCA	[customer name], Jukira okusasula Obusuulu bw’ennyumba yo obutasukka nga 31 December. Weebale nnyo. KCCA.
Delinquents List SMS-city	By paying property rates, you contribute to essential services for the city. KCCA is publicly reporting on property owners who DID NOT pay their balance last year. Here are some of these non-compliers: [100 characters of five names]. Thank you, KCCA	Bw’osasula obusuulu gw’amayumba, oba okoze nnyo ku byetaago ebikulu eby’ekibuga. KCCA egenda kwanika bannanyini bizimbe abataasasula sente zonna ze babanjibwa. Bano beebamu kubataamalayo: [100 characters of five names] Weebale nyo. KCCA
Delinquents List SMS-neighbour	By paying property rates, you contribute to essential services for the city. KCCA is publicly reporting on your neighbours who DID NOT pay their balance last year. Here are some of these non-compliers: [100 characters of five names]. Thank you, KCCA	Bw’osasula obusuulu bw’amayumba, oba okoze nnyo ku byetaago ebikulu eby’ekibuga. KCCA eyatuukiriza baliranwaabo abataasasula sente ezaasigalayo omwaka oguwedde. Bano bebatamalayo: [100 characters of five names] Weebale nyo. KCCA
Delinquents List online-city	By paying property rates, you contribute to essential services for the city. KCCA is publicly reporting on your neighbours who DID NOT pay their balance last year. Visit this link for a list of these non-compliers: kcca.go.ug/reporting-citizens . Thank you, KCCA	Bw’osasula obusuulu bw’amayumba, oba okoze nnyo ku byetaago ebikulu eby’ekibuga. KCCA eyatuukiriza baliranwaabo ababanjibwa. Tuukirira omukutu guno okuli olukalala lw’abatamalayo: kcca.go.ug/reporting-citizens . Weebale nyo. KCCA
Compliers List SMS-city	By paying property rates, you contribute to essential services for the city. KCCA is publicly recognising the contribution made by property owners who PAID their balance last year. Here are some of these compliers: [100 characters of five names]. Thank you, KCCA	Bw’osasula obusuulu bw’amayumba, oba okoze nnyo ku byetaago ebikulu eby’ekibuga. KCCA eyozaayoza mu lwatu bannanyini bizimbe abaaasasula sente ze baali babanjibwa zonna. Bano bebamalayo: [100 characters of five names]. Weebale nnyo. KCCA
Compliers List SMS-neighbour	By paying property rates, you contribute to essential services for the city. KCCA is publicly recognising the contribution made by your neighbours who PAID their balance last year. Here are some of these compliers: [100 characters of five names]. Thank you, KCCA	Bw’osasula obusuulu bw’amayumba, oba okoze nnyo ku byetaago ebikulu eby’ekibuga. KCCA eyozaayoza mu lwatu baliranwaabo abaaasasula sente ezasigalayo omwaka oguwedde. Bano bebaamalayo: [100 characters of five names]. Weebale nnyo. KCCA
Compliers List SMS-wealthy	By paying property rates, you contribute to essential services for the city. KCCA is publicly recognising property owners who PAID their balance of over UGX 2m last year. Here are some of these compliers: [100 characters of five names]. Thank you, KCCA	Bw’osasula obusuulu bw’amayumba, oba okoze nnyo ku byetaago ebikulu eby’ekibuga. KCCA eyozaayoza mu lwatu bannanyini bizimbe abaaasasula UGX 2m, oba okusingawo, omwaka oguwedde. Bano bebaamalayo: [100 characters of five names]. Weebale nnyo. KCCA
Compliers List online-city	By paying property rates, you contribute to essential services for the city. KCCA is publicly recognising the contribution made by property owners who PAID their balance last year. Visit this link for a list of these citizens: kcca.go.ug/honouring-citizens . Thank you, KCCA	Bw’osasula obusuulu bw’amayumba, oba okoze nnyo ku byetaago ebikulu eby’ekibuga. KCCA eyozaayoza mu lwatu nga esiima bannanyini bizimbe abaaasasula sente ezaali zibabanjibwa omwaka oguwedde. Tuukirira omukutu guno okuli abatuuze: kcca.go.ug/honouring-citizens . Weebale nnyo. KCCA

Table A4: KCCA administrative data variables

Outcome variable	Description
Paid Liability	Indicator if total payments made in the treatment period at least covered the annual liability of the property. The indicator is multiplied by 100, so units are interpreted as percentage points.
Any Payment	Indicator if any payment was made towards the property in the treatment period. The indicator is multiplied by 100, so units are interpreted as percentage points.
Share Liability Paid	The total payment amount made towards the property in the treatment period, divided by the property's annual liability. The indicator is multiplied by 100, so units are interpreted as percentage points.
Paid 2020	Indicator variable which = 1 if total payments in the baseline year (2019/2020) covered at least the annual liability of the property.
Liability - Property	The annual tax amount owed for the property, calculated as 6% of the rateable value.
Total Value - Owner	The total value of all properties owned by the owner
Baseline Compliance Rate - Parish	The mean of 'Paid 2020' across properties in the parish.
Baseline Compliance Rate - Village	The mean of 'Paid 2020' across properties in the village.
Number of Property Owners - Parish	The number of unique property owners who own property in the parish where the property is located.
Number of Property Owners - Village	The number of unique property owners who own property in the village where the property is located.
Property Type	The type, or use, of the property. Coded as either Residential, Commercial, or Other.
Legal Entity	Indicator if the owner is a legal entity rather than a private individual.
km to CBD	Distance in kilometers of the property to Kampala City Hall.
Owner Liability	The annual tax amount owed for all properties of the owner.
Population	Population in property's village
Population Density	Population density in property's village

Table A5: Baseline and Endline Survey Attriters Characteristics

	(1)	(2)
	Respondent Completed Baseline (pp)	Respondent Completed Endline (pp)
Paid 2020	2.90 (3.78)	8.20*** (2.53)
Liability (mn UGX)	-1.31 (0.92)	-1.05 (0.64)
Type=Cmrl.	0.29 (3.54)	1.15 (1.88)
Type=Other	5.17 (5.87)	4.98 (3.39)
km to CBD	0.032 (0.83)	-0.38 (0.45)
Owner Liability (mn UGX)	0.052*** (0.013)	0.0056 (0.023)
Legal Entity	-11.7 (9.84)	0.58 (7.79)
Pop. Dense. (th./sqkm)	-0.019** (0.0080)	-0.0079 (0.0074)
Village Pop. (th.)	0.060 (0.29)	0.20 (0.17)
Shr. Vlg. Paid 2020	-18.2 (27.0)	-18.6 (16.3)
Shr. Par. Paid 2020	-12.6 (32.8)	-29.2 (20.6)
Constant	60.1*** (6.14)	65.6*** (3.61)
Mean Outcome	57.5	60.2
N	4258	17140
N clusters	2006	8067

Note: This table presents coefficients from regressions of attrition (in baseline and endline surveys) on pre-intervention characteristics. The samples are all properties of owners who were contacted to be a part of the baseline survey (column 1) and endline survey (column 2). The outcomes are an indicator if the baseline survey was completed (column 1) and an indicator if the endline survey was completed (column 2). Each observation is a property. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Endline survey data variables

Outcome variable	Description
Kampala Comply	Respondent's answer to "Out of every 10 property owners in Kampala that are supposed to pay property rates, how many do you think actually pay?". This is multiplied by 10, so units are interpreted as percentage points.
Rich Comply	Respondent's answer to "Out of every 10 property owners with the most expensive (top 5%) property in Kampala that are supposed to pay property rates, how many do you think actually pay?". This is multiplied by 10, so units are interpreted as percentage points.
Village Comply	Respondent's answer to "Out of every 10 property owners in your village that are supposed to pay property rates, how many do you think actually pay?". This is multiplied by 10, so units are interpreted as percentage points.
Detection Capacity	Indicator if the respondent <i>yes</i> rather than <i>no</i> , <i>don't know</i> , or <i>unsure</i> to "Do you think KCCA has the ability to detect who does and does not pay taxes?". The indicator is multiplied by 100, so units are interpreted as percentage points.
KCCA Acts Best	Indicator if the respondent <i>yes</i> rather than <i>no</i> , <i>don't know</i> , or <i>unsure</i> to "Do you think that KCCA generally acts in the best interests of citizens?". The indicator is multiplied by 100, so units are interpreted as percentage points.
Better Kept Private	Indicator if the respondent <i>yes</i> rather than <i>no</i> , <i>don't know</i> , or <i>unsure</i> to "Do you think that information on whether individuals pay taxes or not should be kept private?". The indicator is multiplied by 100, so units are interpreted as percentage points.
Tax Behav. Publish. in Future	Indicator if the respondent <i>yes</i> rather than <i>no</i> , <i>don't know</i> , or <i>unsure</i> to "Do you think people's tax behaviour will be made public in future?". The indicator is multiplied by 100, so units are interpreted as percentage points.
Unpaid Wrong and Punish.	Indicator if the respondent <i>yes</i> rather than <i>no</i> , <i>don't know</i> , or <i>unsure</i> to "Please tell me whether you think that someone not paying the property rates they owe KCCA is wrong and punishable?". The indicator is multiplied by 100, so units are interpreted as percentage points.
Want others to know complied	Indicator if the respondent <i>yes</i> rather than <i>no</i> , <i>don't know</i> , or <i>unsure</i> to "If you had paid your rates, would you want others to know or not?". The indicator is multiplied by 100, so units are interpreted as percentage points.
Picked-up	Indicator for those survey respondents who answered the call for the endline phone survey
Picked-up & Correct	Indicator for those survey respondents who picked up their phones and were either the individual listed in the KCCA registry, their heir, or their representative on tax matters.

Table A7: Survey attrition balance

	(1)	(2)
	Respondent Completed Baseline (pp)	Respondent Completed Endline (pp)
<i>Panel A: Direct effects</i>		
Reporting	1.10 (3.51)	2.82 (2.17)
Recognition	-0.78 (3.57)	0.52 (2.30)
Enforcement		-0.35 (2.78)
Reciprocity		-0.20 (2.82)
Relationship		-0.82 (2.87)
Control Mean	57.7	59.9
N	4059	16529
N clusters	1929	7886
<i>Panel B: Indirect effects</i>		
	Respondent Completed Baseline (pp)	Respondent Completed Endline (pp)
Delinquent List	3.18 (3.38)	-0.50 (1.67)
Complier List	3.99 (3.72)	-1.03 (1.78)
Wealthy Complier List	6.69 (4.94)	-1.84 (2.76)
Control Mean	54.5	60.1
N	4133	17178
N clusters	1967	8152

Note: This table presents coefficients from regressions of baseline characteristics on a dummy for whether the property owner completed our endline survey. Each observation is a property and only property owners targeted for the endline survey are included. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: Direct (wave 1) Balance Tests

	(1) N	(2) Control Mean	Information			Public Disclosure	
			(3) Enforce	(4) Reciprocity	(5) Relationship	(6) Reporting	(7) Recognition
Paid 2020	174304	0.080	0.0055 (0.0034)	0.0032 (0.0036)	0.0015 (0.0034)	-0.0025 (0.0026)	0.0012 (0.0025)
Liability (mn UGX)	174304	0.29	0.024 (0.021)	0.017 (0.018)	0.034 (0.022)	0.010 (0.011)	-0.0050 (0.012)
Type=Cmrcl.	174304	0.17	-0.0011 (0.0064)	0.0073 (0.0066)	0.00097 (0.0062)	0.0074 (0.0049)	0.0051 (0.0053)
Type=Other	174304	0.064	-0.0023 (0.0061)	-0.011** (0.0051)	-0.0050 (0.0058)	-0.0041 (0.0046)	-0.0077* (0.0047)
km to CBD	171490	4.91	0.012 (0.042)	0.054 (0.042)	0.0033 (0.040)	0.013 (0.033)	0.015 (0.033)
Owner Liability (mn UGX)	174304	21.1	-2.87 (2.15)	-1.66 (2.60)	1.09 (4.54)	6.12 (6.10)	0.74 (2.72)
Legal Entity	174304	0.046	-0.0028 (0.0066)	-0.017*** (0.0056)	-0.0099 (0.0061)	0.0040 (0.0061)	-0.0015 (0.0061)
Pop. Dense. (th./sqkm)	170341	30.6	3.29 (3.63)	0.29 (1.54)	-0.95 (1.50)	-0.028 (1.13)	-0.15 (1.12)
Village Pop. (th.)	170341	5.60	-0.13 (0.087)	-0.20** (0.086)	0.0076 (0.089)	0.020 (0.067)	0.13** (0.067)
Shr. Vlg. Paid 2020	174304	0.11	0.0027 (0.0023)	-0.00010 (0.0017)	0.000042 (0.0018)	0.0024 (0.0015)	-0.0019 (0.0014)
Shr. Par. Paid 2020	174304	0.11	-0.00040 (0.0019)	-0.0020 (0.0014)	0.00070 (0.0014)	0.0021 (0.0014)	-0.00067 (0.0011)

Note: This table presents coefficients from regressions of baseline characteristics on treatment groups from the first endline. Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A9: Direct (wave 1) Treatment Effects with baseline controls

	(1)	(2)	(3)
	Paid Liability (pp)	Any Payment (pp)	Share Liability Paid (pp)
<i>Public Disclosure Effects</i>			
Reporting (τ_S)	0.619 (0.214)	0.821 (0.241)	1.013 (0.202)
Recognition (τ_H)	-0.545 (0.190)	-0.774 (0.207)	-1.017 (0.201)
<i>Benchmark Effects</i>			
Enforcement	1.271 (0.315)	1.463 (0.346)	1.933 (0.285)
Reciprocity	-0.112 (0.309)	-0.119 (0.339)	-0.200 (0.286)
Relationship	-0.545 (0.276)	-0.605 (0.315)	-0.657 (0.286)
p-value ($\tau_S + \tau_H = 0$)	0.83	0.90	0.99
Control Mean	3.4	4.3	5.4
N	170341	170341	170341
N clusters	68362	68362	68362

Note: This table presents treatment effects from the first endline. Each outcome is a measure of payments towards a property in the first endline (may-june 2021): a dummy if at least the annual liability was paid (col. 1), a dummy if some payment was made (col. 2), and the share of annual liability paid (col. 3). We set dummies as (0,100) so that these outcomes can be interpreted as percentage points. Each observation is a property and each model controls for randomisation strata fixed effects and baseline controls: (dummy if property paid liability in previous year (2019/20), property liability, a dummy for commercial properties, a dummy for other non-residential properties, distance to the city centre, total liability of property owner, a dummy if the property owner is a legal entity (not an individual), population and population density of the property's village, and the share of properties paying their liability in the previous year at both the village and parish level.). Standard errors in parentheses are clustered at the property owner level.

Table A10: Direct (wave 1) Heterogeneous Treatment Effects

	<i>dependent variable: Paid Liability (pp)</i>			
	(1)	(2)	(3)	(4)
	Annual Liability	Total Value	Baseline Compliance Rate	
	Property	Owner	Parish	Village
Reporting	0.65** (0.31)	0.94*** (0.29)	0.40 (0.29)	0.50* (0.27)
Reporting \times T2	0.13 (0.36)	-0.69 (0.42)	0.53 (0.40)	0.19 (0.39)
Reporting \times T3	-0.33 (0.48)	-0.31 (0.47)	-0.55 (0.77)	-0.11 (1.07)
Recognition	-0.24 (0.26)	-0.065 (0.27)	-0.31 (0.27)	-0.36 (0.25)
Recognition \times T2	-0.091 (0.30)	-0.37 (0.40)	-0.057 (0.37)	-0.19 (0.36)
Recognition \times T3	-0.85** (0.40)	-0.71* (0.42)	-1.12* (0.66)	-0.89 (0.93)
T2	0.54** (0.23)	1.12*** (0.35)	0.14 (0.28)	0.29 (0.27)
T3	1.69*** (0.30)	2.27*** (0.38)	1.31** (0.51)	1.59** (0.68)
T1 p-value ($\tau_S + \tau_H = 0$)	0.39	0.07	0.86	0.76
T2 p-value ($\tau_S + \tau_H = 0$)	0.31	0.72	0.22	0.77
T3 p-value ($\tau_S + \tau_H = 0$)	0.24	0.80	0.17	0.60
N	130805	130257	130805	130805
N clusters	52173	51956	52173	52173
Control Mean	3.4	3.4	3.4	3.4
First Tercile	97k	2898k	6	8
Second Tercile	211k	7367k	15	20

Note: This table presents heterogeneous treatment effects from the first endline. The sample is restricted to the control and public disclosure treatment groups (benchmark treatments are discarded). The outcome is always a dummy if at least the annual liability was paid in the first endline (may-june 2021). We set the dummy as (0,100) so that the outcome can be interpreted as percentage points. Each column considers a different dimension of heterogeneity broken into terciles: annual liability of the property (col. 1), total property value owned by owner (col. 2), baseline compliance rate in the parish (col. 3), and baseline compliance rate in the village (col. 4). Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A11: Direct (wave 1) Treatment Effects with sub-treatments

	(1)	(2)	(3)
	Paid Liability (pp)	Any Payment (pp)	Share Liability Paid (pp)
<i>Public Disclosure Effects</i>			
Reporting	0.587** (0.285)	0.613** (0.312)	0.877*** (0.245)
Reporting \times Online	-0.0160 (0.324)	0.409 (0.389)	0.253 (0.283)
Recognition	-0.630*** (0.224)	-0.820*** (0.252)	-1.089*** (0.244)
Recognition \times Online	0.159 (0.254)	0.0696 (0.283)	0.0660 (0.282)
<i>Benchmark Effects</i>			
Enforcement	1.290*** (0.316)	1.509*** (0.353)	1.911*** (0.282)
Reciprocity	-0.0674 (0.311)	-0.0454 (0.343)	-0.159 (0.283)
Relationship	-0.503* (0.274)	-0.520 (0.317)	-0.595** (0.283)
N	174304	174304	174304
N clusters	69584	69584	69584
Control Mean	3.4	4.2	5.4

Note: This table presents treatment effects from the first endline. Treatments are interacted with sub-group treatments: the base sub-treatment is always public disclosure by text message. Each outcome is a measure of payments towards a property in the first endline (may-june 2021): a dummy if at least the annual liability was paid (col. 1), a dummy if some payment was made (col. 2), and the share of annual liability paid (col. 3). We set dummies as (0,100) so that these outcomes can be interpreted as percentage points. Each observation is a property and each model controls for randomisation strata fixed effects and baseline controls: (dummy if property paid liability in previous year (2019/20), property liability, a dummy for commercial properties, a dummy for other non-residential properties, distance to the city centre, total liability of property owner, a dummy if the property owner is a legal entity (not an individual), population and population density of the property's village, and the share of properties paying their liability in the previous year at both the village and parish level.). Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A12: Direct (wave 1) effects in endline survey sample

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A</i>	Paid Liability (pp)	Any Payment (pp)	Share Liability Paid (pp)	All Kampala Comply (pp)	Rich Kampala Comply (pp)	Own Village Comply (pp)
Reporting	-0.21 (0.97)	-0.26 (1.09)	-0.40 (1.29)	-2.00 (1.75)	-1.90 (2.14)	-2.56 (1.64)
Recognition	-0.29 (0.85)	-0.69 (0.93)	-0.69 (1.19)	0.28 (1.48)	0.26 (1.96)	0.40 (1.58)
Control Mean	4.13	5.45	6.43	50.81	59.50	33.27
N	7400	7400	7400	6238	6255	6192
N clusters	3495	3495	3495	2939	2934	2903
<i>Panel B</i>	KCCA Detection Capacity (pp)	KCCA Acts in Best Interest (pp)	Tax Behav. Publish. in Future (pp)	Unpaid Wrong and Punish. (pp)	Compliance Better Kept Private (pp)	Want others to know complied (pp)
Reporting	-0.37 (2.03)	1.32 (2.88)	-0.79 (1.93)	1.65 (1.70)	2.37 (2.88)	-1.93 (2.92)
Recognition	-1.83 (2.63)	-1.05 (2.76)	-0.39 (1.97)	4.79* (2.48)	1.68 (3.00)	0.93 (3.12)
Control Mean	90.44	45.50	86.74	10.93	35.94	60.65
N	7003	6793	6771	7400	6991	7112
N clusters	3335	3231	3246	3495	3327	3349

Note: This table presents treatment effects from the first endline in the survey sample on payment and state belief outcomes. In panel A, outcomes vary by column: the first three columns are the same as those in Table ??, and the next three are beliefs about the compliance rate for all of Kampala, the richest 5% of owners by property value, and the other owners in the respondent's own village. In panel B, outcomes vary by column: believes the KCCA can detect who pays tax (col. 1), believes the KCCA acts in the best interest of its citizens (col. 2), believes that tax behaviour will be publicly disclosed in the future (col. 3), believes that tax delinquency is wrong and punishable (col. 4), believes that tax behaviour is better kept private (col. 5), and believes they would want it known that they pay taxes if they comply (col. 6). Each observation is a property and each model controls for randomisation strata fixed effects. In all specifications we apply Inverse Probability of Attrition weights estimated from a logit regression on the baseline characteristics in Table A5. Standard errors in parentheses are clustered at the property owner level. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A13: Direct (wave 1) Spillover Tests

	(1)	(2)	(3)	(4)	(5)	(6)
	Paid Liability (pp)	Paid Liability (pp)	Any Payment (pp)	Any Payment (pp)	Share Liability Paid (pp)	Share Liability Paid (pp)
Enforcement	1.25*** (0.32)	1.26*** (0.32)	1.45*** (0.35)	1.45*** (0.35)	1.86*** (0.48)	1.89*** (0.48)
Reciprocity	-0.24 (0.30)	-0.23 (0.31)	-0.24 (0.34)	-0.23 (0.34)	-0.38 (0.48)	-0.35 (0.48)
Relationship	-0.54** (0.27)	-0.54** (0.27)	-0.55* (0.32)	-0.55* (0.32)	-0.70 (0.46)	-0.70 (0.46)
Reporting	0.60*** (0.22)	0.62*** (0.22)	0.76*** (0.24)	0.78*** (0.24)	0.94*** (0.36)	0.98*** (0.36)
Recognition	-0.56*** (0.20)	-0.54*** (0.20)	-0.81*** (0.22)	-0.79*** (0.22)	-1.05*** (0.32)	-1.01*** (0.32)
Share Nghbs. Benchmark	0.28 (0.49)	0.25 (0.49)	0.56 (0.55)	0.52 (0.55)	0.63 (0.75)	0.58 (0.75)
Share Nghbs. Report	0.060 (0.48)	0.10 (0.48)	0.44 (0.55)	0.49 (0.55)	0.62 (0.74)	0.70 (0.74)
Share Nghbs. Recognition	-0.31 (0.49)	-0.32 (0.49)	-0.023 (0.55)	-0.042 (0.55)	-0.30 (0.73)	-0.32 (0.73)
N Nghbs. FE		✓		✓		✓
Control Mean	3.4	3.4	4.3	4.3	5.4	5.4
N	166406	166403	166406	166403	166406	166403
N clusters	67883	67883	67883	67883	67883	67883

Note: This table presents treatment effects from the first endline with spillover estimates from neighbours within 50m. Local exposure is measured as the share of distinct property owners within 50m of the property assigned to each treatment group: benchmark effects, reporting, and recognition. Columns 2,4, and 6 include FEs for the number of distinct property owners within 50m. The outcomes are the same as in Table ???. We multiply this dummy by 100 so that these outcomes can be interpreted as percentage points. Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A14: Indirect (wave 2) Balance Tests

	(1)	(2)	(3)	(4)	(5)
	N	Control Mean	Delinquent List	Complier List	Wealthy Compliers
Paid 2020	176762	0.11	-0.0023 (0.0025)	-0.0014 (0.0025)	0.00070 (0.0039)
Liability (mn UGX)	176762	0.33	-0.016 (0.014)	-0.013 (0.015)	-0.026 (0.023)
Type=Cmrcl.	176762	0.18	0.0042 (0.0041)	-0.00037 (0.0044)	0.0055 (0.0063)
Type=Other	176762	0.065	-0.0024 (0.0037)	-0.0074* (0.0039)	-0.0088* (0.0051)
km to CBD	174036	4.92	-0.040 (0.027)	-0.032 (0.028)	0.049 (0.043)
Owner Liability (mn UGX)	176762	27.5	-5.14 (3.67)	-3.56 (3.87)	-6.09 (5.82)
Legal Entity	176762	0.049	-0.0059 (0.0043)	-0.0042 (0.0049)	-0.0027 (0.0070)
Pop. Dense. (th./sqkm)	172883	30.0	1.91 (1.27)	0.56 (1.11)	-0.92 (1.31)
Village Pop. (th.)	172883	5.52	-0.0062 (0.057)	-0.0057 (0.060)	-0.073 (0.088)
Shr. Vlg. Paid 2020	176762	0.11	-0.00093 (0.0013)	0.00031 (0.0014)	0.00036 (0.0022)
Shr. Par. Paid 2020	176762	0.11	-0.00050 (0.0012)	-0.00055 (0.0013)	-0.00067 (0.0020)

Note: This table presents coefficients from regressions of baseline characteristics on treatment groups from the second endline. Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A15: Indirect (wave 2) Treatment Effects with baseline controls

	(1)	(2)	(3)
	Paid Liability (pp)	Any Payment (pp)	Share Liability Paid (pp)
Delinquent List (κ_S)	-0.639 (0.175)	-0.832 (0.218)	-1.294 (0.333)
Complier List (κ_H)	-0.773 (0.185)	-0.788 (0.257)	-1.301 (0.359)
p-value ($\kappa_S = \kappa_H$)	0.41	0.85	0.98
Control Mean	3.2	4.6	5.9
N	158151	158151	158151
N clusters	62911	62911	62911

Note: This table presents treatment effects from the second endline. Each outcome is a measure of payments towards a property in the second endline (nov-dec 2021): a dummy if at least the annual liability was paid (col. 1), a dummy if some payment was made (col. 2), and the share of annual liability paid (col. 3). We set dummies as (0,100) so that these outcomes can be interpreted as percentage points. Each observation is a property and each model controls for randomisation strata fixed effects and baseline controls: (dummy if property paid liability in previous year (2019/20), property liability, a dummy for commercial properties, a dummy for other non-residential properties, distance to the city centre, total liability of property owner, a dummy if the property owner is a legal entity (not an individual), population and population density of the property's village, and the share of properties paying their liability in the previous year at both the village and parish level.). Standard errors in parentheses are clustered at the property owner level.

Table A16: Indirect (wave 2) Heterogeneous Treatment Effects

	<i>dependent variable: Paid Liability (pp)</i>			
	(1)	(2)	(3)	(4)
	Annual Liability	Total Value	Baseline Compliance Rate	
	Property	Owner	Parish	Village
Delinquent List	-0.81*** (0.17)	-0.54*** (0.19)	-0.71*** (0.23)	-0.92*** (0.22)
Delinquent List \times T2	0.21 (0.22)	-0.30 (0.28)	-0.091 (0.32)	0.45 (0.31)
Delinquent List \times T3	0.31 (0.38)	-0.074 (0.37)	0.52 (0.62)	0.47 (0.81)
Complier List	-0.67*** (0.19)	-0.70*** (0.19)	-1.11*** (0.23)	-1.10*** (0.21)
Complier List \times T2	-0.13 (0.24)	-0.0057 (0.30)	0.33 (0.33)	0.50* (0.30)
Complier List \times T3	-0.15 (0.41)	-0.18 (0.38)	0.80 (0.64)	0.66 (0.92)
T2	0.51*** (0.17)	0.92*** (0.24)	0.19 (0.26)	0.066 (0.23)
T3	2.17*** (0.28)	2.08*** (0.29)	0.98** (0.46)	1.45** (0.63)
T1 p-value ($\kappa_S = \kappa_H$)	0.42	0.38	0.04	0.32
T2 p-value ($\kappa_S = \kappa_H$)	0.30	0.51	0.89	0.57
T3 p-value ($\kappa_S = \kappa_H$)	0.36	0.37	0.84	0.99
N	161709	161002	161709	161709
N clusters	64004	63712	64004	64004
Control Mean	3.1	3.1	3.1	3.1
First Tercile	97k	2899k	6	8
Second Tercile	211k	7367k	15	20

Note: This table presents heterogeneous treatment effects from the second endline. The sample is restricted to the control and public disclosure treatment groups (the recognition of wealthy treatment group is discarded). The outcome is always a dummy if the property paid their annual liability in the second endline (nov-dec 2021). We set the dummy as (0,100) so that the outcome can be interpreted as percentage points. Each column considers a different dimension of heterogeneity broken into terciles: annual liability of the property (col. 1), total property value owned by owner (col. 2), baseline compliance rate in the parish (col. 3), and baseline compliance rate in the village (col. 4). Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A17: Indirect (wave 2) Treatment Effects with sub-treatments

	(1)	(2)	(3)
	Paid Liability (pp)	Any Payment (pp)	Share Liability Paid (pp)
Delinquent List	-0.868*** (0.234)	-1.130*** (0.300)	-1.619*** (0.409)
Delinquent List × Online	0.339 (0.264)	0.366 (0.342)	0.470 (0.461)
Delinquent List × Neighbours	0.334 (0.275)	0.422 (0.353)	0.480 (0.491)
Complier List	-0.751*** (0.239)	-0.699** (0.308)	-1.305*** (0.431)
Complier List × Online	0.0465 (0.301)	0.0220 (0.487)	0.327 (0.589)
Complier List × Neighbours	-0.0573 (0.285)	-0.268 (0.382)	-0.253 (0.499)
Wealthy Complier List	-0.258 (0.408)	-0.352 (0.507)	-0.763 (0.603)
N	176762	176762	176762
N clusters	69853	69853	69853
Control Mean	3.1	4.6	0.0

Note: This table presents treatment effects from the second endline. Treatments are interacted with sub-group treatments: the base sub-treatment is always an SMS list of compliers (for recognition) or delinquents (for reporting) drawn randomly from the city. Each outcome is a measure of payments towards a property in the second endline (nov-dec 2021): a dummy if at least the annual liability was paid (col. 1), a dummy if some payment was made (col. 2), and the share of annual liability paid (col. 3). We set dummies as (0,100) so that these outcomes can be interpreted as percentage points. Each observation is a property and each model controls for randomisation strata fixed effects and baseline controls: (dummy if property paid liability in previous year (2019/20), property liability, a dummy for commercial properties, a dummy for other non-residential properties, distance to the city centre, total liability of property owner, a dummy if the property owner is a legal entity (not an individual), population and population density of the property's village, and the share of properties paying their liability in the previous year at both the village and parish level.). Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A18: Indirect (wave 2) effects on compliance and beliefs

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A</i>	Paid Liability (pp)	Any Payment (pp)	Share Liability Paid (pp)	All Kampala Comply (pp)	Rich Kampala Comply (pp)	Own Village Comply (pp)
Delinquent List	-1.69** (0.66)	-2.40*** (0.79)	-3.25*** (1.23)	-2.29** (1.16)	-4.59*** (1.54)	-0.57 (1.22)
Complier List	-1.79** (0.74)	-2.17** (0.91)	-3.69*** (1.33)	-1.58 (1.26)	-3.52** (1.56)	1.25 (1.33)
Control Mean	4.41	6.09	8.05	52.62	62.19	34.05
N	7230	7230	7230	7230	7230	7230
N clusters	3458	3458	3458	3458	3458	3458
<i>Panel B</i>	KCCA Detection Capacity (pp)	KCCA Acts in Best Interest (pp)	Tax Behav. Publish. in Future (pp)	Unpaid Wrong and Punish. (pp)	Compliance Better Kept Private (pp)	Want others to know complied (pp)
Delinquent List	-1.73 (1.65)	-0.31 (2.43)	-1.69 (1.84)	-0.38 (1.80)	4.66** (2.32)	-4.18* (2.39)
Complier List	-0.13 (1.94)	2.14 (2.55)	-1.74 (2.10)	-3.05 (1.95)	-0.19 (2.36)	0.42 (2.54)
Control Mean	87.04	45.45	82.74	14.25	31.00	62.16
N	7230	7230	7230	7230	7230	7230
N clusters	3458	3458	3458	3458	3458	3458

Note: This table presents treatment effects from the second endline in the survey sample on payment and state belief outcomes. In panel A, outcomes vary by column: the first three columns are the same as those in Table 1, and the next three are beliefs about the compliance rate for all of Kampala, the richest 5% of owners by property value, and the other owners in the respondent's own village. In panel B, outcomes vary by column: believes the KCCA can detect who pays tax (col. 1), believes the KCCA acts in the best interest of its citizens (col. 2), believes that tax behaviour will be publicly disclosed in the future (col. 3), believes that tax delinquency is wrong and punishable (col. 4), believes that tax behaviour is better kept private (col. 5), and believes they would want it known that they pay taxes if they comply (col. 6). Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A19: Indirect (wave 2) Spillover Tests

	(1)	(2)	(3)	(4)	(5)	(6)
	Paid Liability (pp)	Paid Liability (pp)	Any Payment (pp)	Any Payment (pp)	Share Liability Paid (pp)	Share Liability Paid (pp)
Delinquent List	-0.68*** (0.17)	-0.67*** (0.17)	-0.89*** (0.21)	-0.87*** (0.21)	-1.35*** (0.32)	-1.34*** (0.32)
Complier List	-0.84*** (0.18)	-0.85*** (0.18)	-0.93*** (0.23)	-0.94*** (0.23)	-1.43*** (0.34)	-1.44*** (0.34)
Share Nghbs. Delinquent List	-0.031 (0.38)	0.013 (0.38)	0.020 (0.50)	0.079 (0.50)	0.050 (0.70)	0.12 (0.71)
Share Nghbs. Complier List	-0.074 (0.40)	-0.070 (0.40)	-0.047 (0.49)	-0.039 (0.49)	-0.46 (0.69)	-0.45 (0.69)
N Nghbs. FE		✓		✓		✓
Control Mean	3.1	3.1	4.5	4.5	5.8	5.9
N	154011	154008	154011	154008	154011	154008
N clusters	62413	62413	62413	62413	62413	62413

Note: This table presents treatment effects from the second endline with spillover estimates from neighbours within 50m. Local exposure is measured as the share of distinct property owners within 50m of the property assigned to each treatment group: delinquent list, and complier list. Columns 2,4, and 6 include FEs for the number of distinct property owners within 50m. The outcomes are the same as in Table ???. We multiply this dummy by 100 so that these outcomes can be interpreted as percentage points. Each observation is a property and each model controls for randomisation strata fixed effects. Standard errors in parentheses are clustered at the property owner level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

C Model further details

C.1 Perceived probabilities under public disclosure states

For the regime with no public disclosure, i.e. in our control group, we denote the probability of being believed to be a property owner $p_0 = p_1 = \underline{p}$, and the probability of being believed to be a tax delinquent as $q_e = \underline{q}_e$ for evasion choice e . Notably, we are assuming that, without public disclosure, the decision to evade does not affect the likelihood that one is detected as a property owner.

Under the public reporting regime, an agent that chooses to evade will be discovered through the reporting program with probability θ . If they are discovered through the program, they are believed with certainty to be a delinquent owner, and otherwise they take the baseline probabilities for an evader, i.e. $p_1 = \theta \cdot 1 + (1 - \theta)\underline{p}$ and $q_1 = \theta \cdot 1 + (1 - \theta)\underline{q}_1$. An agent that chooses to comply in the reporting regime faces the baseline probabilities of perceived status, i.e. $p_0 = \underline{p}$ and $q_0 = \underline{q}_0$.

Under the public recognition regime, an agent that chooses to comply will be discovered through the recognition program with probability θ . If they are discovered through the program, they are believed with certainty to be a compliant owner, and otherwise they take the baseline probabilities for a complier, i.e. $p_0 = \theta \cdot 1 + (1 - \theta)\underline{p}$ and $q_0 = \theta \cdot 0 + (1 - \theta)\underline{q}_0$. An agent that chooses to evade in the recognition regime faces the baseline probabilities of perceived status, i.e. $p_1 = \underline{p}$ and $q_1 = \underline{q}_1$.

C.2 Getting an expression for policy counterfactuals

Plugging the perceived probabilities under each regime back in to equation 4 and simplifying notation by denoting the baseline regime net benefits of evasion as $\underline{B} \equiv m + i + z[\underline{q}_1 - \underline{q}_0]$, the share of evaders under each regime, λ_σ , will be:

$$\begin{aligned}\lambda_C &= F(\underline{B}) \\ \lambda_S &= F(\underline{B} + \theta[x(1 - \underline{p}) + z(1 - \underline{q}_1)]) \\ \lambda_H &= F(\underline{B} + \theta[-x(1 - \underline{p}) + z\underline{q}_0])\end{aligned}$$

We assume that public disclosure policies induce a small enough change in payoffs that their effect on compliance can be approximated by a first order Taylor series, i.e. $F(v) \approx F(\underline{B}) + (v - \underline{B})F'(\underline{B})$. Therefore, the direct effect of public reporting τ_S and public recognition τ_H on compliance (note that compliance is $1 - \lambda$) can be expressed as:

$$\begin{aligned}\tau_S &\equiv \lambda_C - \lambda_S = -\theta[x(1 - \underline{p}) + z(1 - \underline{q}_1)]F'(\underline{B}) \\ \tau_H &\equiv \lambda_C - \lambda_H = -\theta[-x(1 - \underline{p}) + z\underline{q}_0]F'(\underline{B})\end{aligned}$$

This gives us the expressions for reporting and recognition effects on compliance that we analyze in Section 5.2.

D Sub-treatment direct and indirect effects by mode

In Table A11 we break down direct public disclosure effects by mode. We find no evidence that the direct effects of public disclosure (recognition or reporting) vary by whether disclosure will be online rather than SMS.

In Table A17 we breakdown indirect public dissemination effects by mode and sample. Again, we find no evidence that the indirect effects of public dissemination (Complier or Delinquent Lists) vary by whether the taxpayers disclosed are sample from the city as a whole, the local neighbourhood, or posted to a searchable online list.

Why is there no heterogeneity in terms of public disclosure mode, i.e. SMS or online lists - particularly for indirect effects? We explore this further in our endline survey, where we ask taxpayers about messages they received over the course of the year. In general, there does not appear to be accurate recall regarding receiving a link to an online list - out of those taxpayers who received a message, 11% recall the message containing a link, but this 11% holds even when we focus on only those that were in a treatment group with a link. Further, only 15% of those claiming to have received a link report opening it. This suggests that the added effort and/or phone capacity needed to open online links limits the effectiveness of sending information in this way. Therefore, given that we find effects of similar magnitude for SMS and online lists, it could be that the treatment on the treated effects for online lists are much larger, or simply that many respondents pay similarly limited attention to the SMS lists.

E Follow-up survey: selected quotations

In this section we report a broad and representative sample of quotes from our follow up survey respondents. Quotes are categorized by topic.

E.1 Public ownership costs

E.1.1 Financial Favours

- 302: “If it is known that so and so is a landlord and many don’t know I will get problems sixfold. Someone would expect money from me because of what he sees. So they would expect much from you. They believe you have money and if they come any time you should be able to give them. No doubt about that. You find so many people who would come to borrow money from you.”

- 22320: “We have people at home who don’t know that you have a property somewhere and you get some money from it. But should they know they start pinning you ”You get this and that money. We want this and that” and they demand forcefully.”
- 352: “When they know you are the owner of that building the family is on your neck.”

E.1.2 Access to / paying back loans

- 22340: “Currently most people live on loans. Now if that list is published someone who loaned you money comes to know about it don’t you see him coming to you anytime?”
- 1262: “Yes because let’s say you owe some people money. When they get to know that you own property they come demanding for their money.”
- 1228: “When they see a building like that and come to know that you are a landlady they would say ’No this person lied to us. She can afford the school fees. We shall not give her a bursary. Let her pay the fees.’”

E.1.3 Robbery/violence

- 1216: “You can even be living with someone when you don’t know how much they earn. And people don’t want to open up. There are some reasons because even the people you are with after telling them you have such a property take it wrongly or might even want to seal it and use it for their own purpose. They can be dangerous to you. I have this bad feeling that people usually don’t open up much on the property they own. ...Not everybody has a positive attitude towards people having things.”
- 1231: “Take an example if all it is a high place like say Kololo the value sometimes people target that for bad intentions. They say ’This man has these things around him. We can do away with him and get the money!’”
- 33404: “Like there are so many thieves around they get to know that you have such kind of wealth you must be having money. You see sometimes even seeing where you work then they come and attack you at night. So now if they know you have a number of rental properties they come and attack you demanding for money because the month has ended since they imagine the tenants have paid you.”

E.1.4 Resentment from others

- 954: “Some people hire others to hurt you while others decide to do it by witchcraft.”

E.2 More Taxes from URA

- 22721: “URA will come to know about and tax impose more tax.”

E.2.1 Revealing illicit ownership

- 1231: “Land has never been straight and there are a lot of interests when it comes to land, more so when you disclose the ownership. If it is the right ownership it is okay. But when it comes via the wrong motives, it becomes dangerous.”
- 123: “They may say you stole the money. They may say you stole the property. The property is not yours you grabbed it from another person. Those kinds of things.”
- 337: “Most probably by nature they don’t want to be exposed or maybe because of the way they got the money still or the position of work they hold wherever they work from. And they want to be discreet in what they own...I think Africans have a mentality of let’s keep our wealth in brick and mortar. So you find that most of these apartments that are coming up most of these commercial properties that are coming up are as a result of let me just quote ‘unclean money.’”

E.2.2 Fighting within the family

- 128: “There are some laws which had been passed sometimes back that the moment you have married a wife and she’s a married wife any properties of yours the moment you die they will have to share...The woman maybe you even got the property before you married her ah? So if it comes to death she will come and claim what she has not worked for.”
- 221547: “Even the children can be a threat. The current generation of children is unbelievable. One can say let’s eliminate her so we can get the property. That is the world we are in. Everyone knows the kind of people they live with.”
- 440: “For example if he has more than one wife it is possible one of them may not know about some of his properties.” ... “Due to a lack of trust in one of the wives he decides to hide information about his properties from her. So if the wife finds out from the public list it could bring about fights within the family because she would feel hurt and accuse him of mistrust...One of the disadvantages of his relatives knowing about his properties is the possibility of them fighting over the inheritance if he passes away therefore causing instability in the home.”

E.3 Public ownership benefits

E.3.1 Pride in wealth

- 151: “An advantage would be prestige. Because people didn’t know that you own an aeroplane. Now they know you have an aeroplane. They would look at you in another level.” [on benefits of public ownership knowledge]

E.3.2 Security of tenure

- 1231: “Maybe for people who are directly involved in land wrangles because if I am at all a neighbor to somebody the list is there and in the system they are saying you are the rightful owner it sends a message to the other party.”

E.3.3 Access to loans

- 22744: “When he wants to take a loan and they know he owns property it would be easy to lend him money unlike if he does not have any such things because the lender would wonder where he would find the money to pay back. A landlord can use his property as collateral for a loan to start another business.”

E.4 Public delinquency costs

E.4.1 Seen as immoral

- 440: “Most people are quick to judge others without fully understanding the circumstances. You may come and tell me that for this house you would pay 150000 shillings for it but the fact would be that the house goes for 80000 shillings. So these people would quickly judge you without understanding the taxes over which you are being apprehended and how it was determined/evaluated.”

E.4.2 Seen as Poor

- 221102: “Even money lenders who would access that information would not lend you money because they would assume you would not pay it back.”

E.4.3 Not contributing their fair share

- 221102: “I think you would be associated with someone who does not wish his country well. It is like you don’t wish your own Country well... You are not contributing your share.”
- 22325: “People will start discussing you in public ‘You see that man doesn’t pay taxes and so on and so on. ... it is an embarrassment for him before his friends brothers and so on. ... They will say he is stubborn. He is a defaulter. Some people default not because they don’t have the money but they choose to not pay taxes. ... Public services come from the taxes and so if they are not there people will say it’s because of his defaultness.’”

E.4.4 Issues with tenants

- 22744: “Even the tenants get worried because they know that any time the premises may be locked up. We see this happening even in this area. So one can incur costs for not paying.”

E.5 Public Compliance Benefits

E.5.1 Encouraging tenants to pay

- 1231: “When I am talking to my tenants I have proof that really I need the rental money on the first of every month. I have a background that really I’m not the only one needing the money but it is a responsibility also for me to pay the taxes in time.”

E.6 Year 1 messages sending a signal about compliance

- 221102: “Actually by the time they decide to send such a message it means people are not paying.” ... “This message indicates that people are not paying.” [after seeing year 1 reporting message]

E.7 Indirect Effect Mechanisms

E.7.1 Higher compliance beliefs from complier lists

- 123: “KCCA wouldn’t have released this if the number of people who paid had not increased.”
- 337: “I feel by the time they send these messages they are only trying to awaken those who are still asleep but they have a substantial number of people who have complied. And that is why they feel confident to put their names out.”

E.7.2 Lower compliance beliefs from complier lists

- 123: 22718: “From these names I could look for those who were compliant and here they are missing from this list. It can make me think that since so and so are not on the list it seems the number of those paying has reduced.”
- 33404: “Based on these people shown here I feel that a lot more people could have paid than are shown here. But when only these people are shown as those who paid their balances it shows that the number had reduced. This is because they could have communicated in percentages those who paid and those who did not pay like 50%. Or that those who paid are like 70% then you would think that ‘I may be amongst the remaining 30% that has not paid. Let me also go and pay.’ But from the message since just a few people who paid are listed it is discouraging. Many people would say let me just pay what I can.”

E.7.3 KCCA acting unfairly in using public disclosure

- 1231: “Not relevant to me now to publish another list to other people. Let it be a business between me and KCCA. Not with the rest of the people because we also have different scenarios. Yeah we are all property owners but have different challenges.”
- 1008: [Listing people will] “harden their hearts”

E.8 Low tax morale

E.8.1 Lack of adequate public services

- 221509: “To be proud of your tax payment means getting back benefits from the people you paid taxes to. In that case you feel proud about what you have done. But here you pay and you are not getting anything. Talk about the KCCA taxes we pay but waste management is so poor and many other things.”
- 352: “We feel even the taxes are not being used to our benefit. So, we would not care if you pay, or if you don’t pay...if you pay, it is not going to benefit me. I don’t know, I don’t see where it benefits me. So, if you pay or don’t pay, it’s the same.”
- 22309: “KCCA is like a bottomless pit. ... Paying taxes taxes taxes but what is there to show? Why can’t they give back to the communities? Maybe there’s something positive but I’ve never really gone out and seen it. ... But what I’ve realized is most of the communities do things for themselves. ...” [in response to year 2 reporting message which says “contribute to the essential services for the city”]
- 1231: “When you look at the environment of Kololo it is quite different from here. But remember we are all contributing to the national cake of development. And we have projections. If at all KCCA would come and say that within [respondent area] here this is our plan. For [respondent area]. I also get that urge to really pay the taxes because I have seen where our plan is projected.”
- 221112: “What is the value of KCCA to us as we give them these taxes? They even gave us very high rates. Eh? They gave us very high taxes. How do they help us? We pay electricity for ourselves we pay the water bills for ourselves everything. Yet they don’t help us even though we are paying them all this money. What is their value to us because we pay them taxes? They demand what I labor for. When I fail they confiscate the property.”

E.8.2 Taxes unaffordable

- 302: ““If I am not a thief, I don’t have any problem with [delinquency being published]... if it so happens to come out like that, I could defend myself. They just rate the taxes too highly and we fail to pay.”

E.8.3 Lack of Sensitisation/Community Engagement

- 1128: “If anything is going to be affected people need to be informed or sensitized so that they are committed...people have to come like you did today and we are talking. And if there was anything you told me today about taxes I would happily pay but those people (KCCA) did not do anything like this.”
- 458: “KCCA is not acting fairly. This is because sometimes they send the messages before without finding out what is on the ground.”

- 440: “KCCA should have started by coming to the ground before sending messages to the people based on what they discovered.... Messages are sent to people’s phones but they don’t take them seriously and they don’t even read them. Someone may read it a bit but ignore it once find out it’s from KCCA. It means that for KCCA to get what it wants from the people it must reach out physically to them and find out their thoughts.”