Online Appendix

for

Building State and Citizen: Experimental Evidence on How Formal Taxation in Congo Engenders Citizen Engagement with the State

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1 Background Information

This appendix section contains background information about the 2016 property tax campaign in Kananga, D.R. Congo. As noted in the paper, random assignment of the program occurred on the polygon level. Figure 1 shows a zoomed-in version of polygons in one part of the city. Polygon boundaries were drawn to approximate roads, ravines, and other landmarks that would be recognizable from the ground.

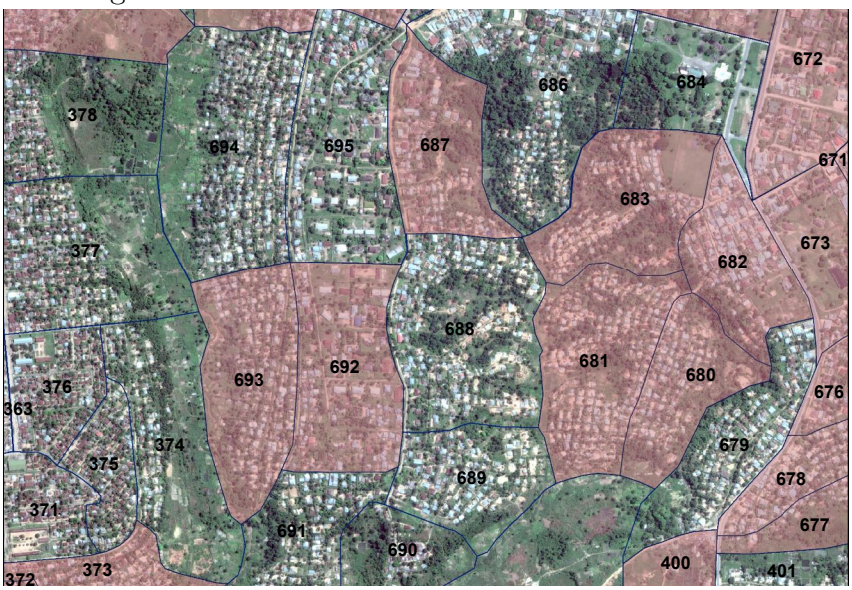

Figure 1: Polygons in Kananga. Red shading indicates assignment to the tax program.

Tax collectors used tablets and handheld receipt printers for the property tax campaign. Examples of receipts can be seen in Figure 2. Receipts were unique and contained the household identification code assigned by tax collectors during the census. Only such printed receipts were considered valid for the campaign.

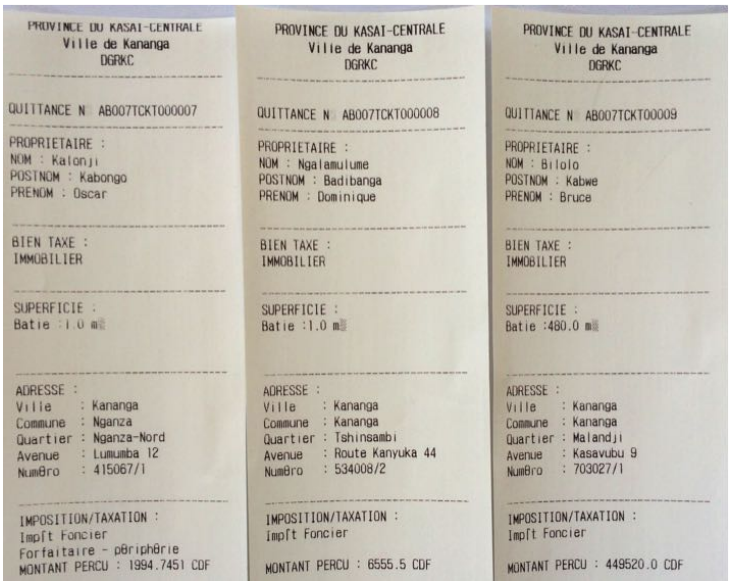

Figure 2: Three examples of printed receipts from the property tax campaign

As noted in the paper, baseline survey respondents reported high expectations for the provincial government in public goods provision. Figure 3 shows the percentage of respondents who thought the provincial government (or another possible provider) should be "primary responsible" for the provision of public goods for each of the sectors indicated below. The provincial government is deemed the principal provide in three sectors (water, welfare, and security) and the second most important provider in three sectors (schools, health, and roads).

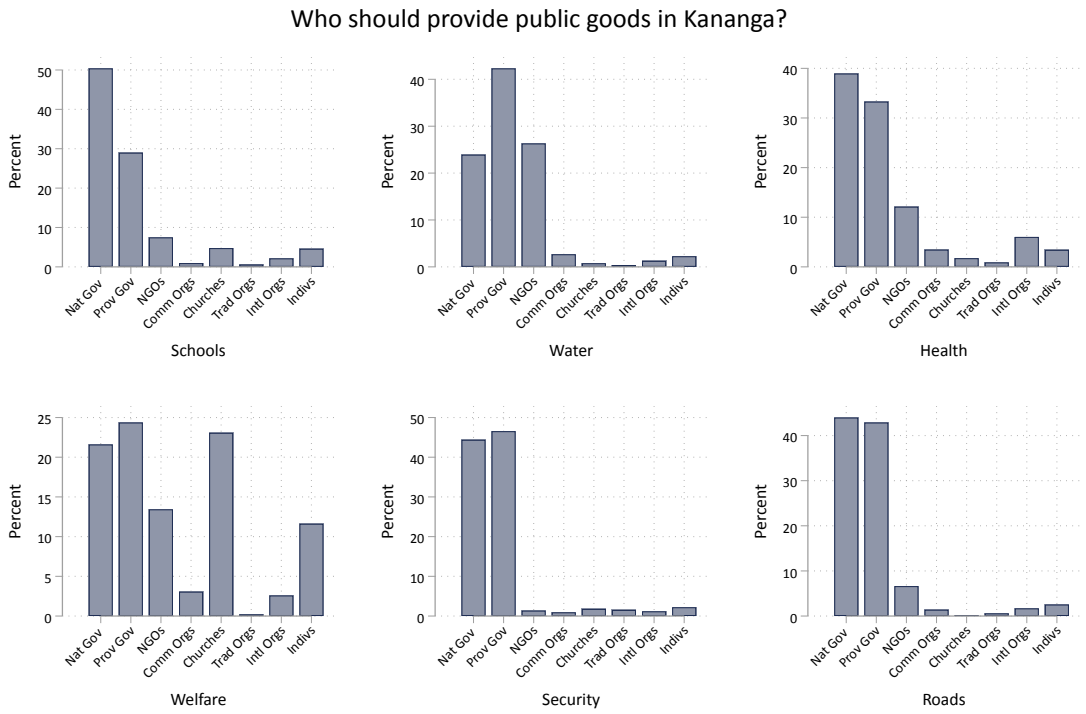

Figure 3: Baseline views of who should provide public goods.

2 Cross-randomized anticorruption interventions

This study also included two cross-randomized interventions targeting corruption. First, there is a standard government audit treatment. In half of the neighborhoods that received the the program, quarterly reports from surveys conducted by independent enumerators were shared with tax ministry leadership. These reports compared official program data to households' self reports to estimate if money is missing from each selected neighborhood. Tax collectors were informed — verbally and on their assignment sheets — which of the neighborhoods were to be audited before starting collection. During the initial tax collector training, tax ministry leadership pledged to sanction collectors found to be pocketing money during the campaign. The fear of such sanctions could increase honesty in audited polygons if these threats are credible. Independent enumerators also collected information in non-audited, treated polygons and in control polygons. But the research team did not transmit this information to the government.

Second, a citizen-level information treatment was also cross-randomized in all polygons. During administration of a short baseline survey before tax collection began, enumerators handed out fliers in French (spoken by everyone with some schooling) and Tshiluba (the most widely spoken local language) to every fifth house in the city. There were two versions of this flier. The control flier (Figure 5) announced that tax collectors would be starting this campaign in the coming months to help boost revenues for the government's development policies. The treatment flier (Figure 4) contained the same information plus (1) the tax rate that households face, and (2) a photograph of the type of printed receipt households should receive upon payment under the new program. Could simply providing citizens information about the tax rate and the collection procedure offer an inexpensive way to reduce corruption? This intervention seeks to answer this question.

Half of all polygons (taxed and non-taxed) were selected to receive the flier with more information. Such information should limit the ability of collectors to take advantage of the information asymmetry associated with the roll out of a property campaign for the first time. If a collector claims that a citizen owes an artificially high rate, the citizen should detect the lie and may demand the true rate. Moreover, simultaneously intervening on the citizen-side and the collector-side in a tax-collection transaction creates an opportunity to test for complementarities between these approaches to reduce corruption.

Key baseline covariates were balanced across the relevant treatment and control groups for these anticorruption interventions, as shown in the pre-analysis plan. Additionally, within the endline sample, receipt of the treatment flier is balanced across individuals in program and control polygons. A difference in means tests fails to reject the null of equivalence ($t = -0.91$). Table 1 summarizes the three interventions (the on-the-ground tax program, audits, and informational fliers).

	Program		
	Audit	**No Audit**	**Control**
Info	65	62	88
No Info	60	66	90

Table 1: Polygons (clusters) in each treatment cell

NOTICE

Please take note of the following information:

- The DGRKOC collectors will start to collect property and rental taxes this year. They might come to your household for this reason in the following months.
- The amount due for the property tax is 2,000 CF, unless you live in a large house or a multi-storied house. The property tax should be paid only one time per year.
- The amount due for the rental tax is 20% of monthly rent, retained at the source. The rental tax should be paid each month.
- The DGRKOC tax collectors should give you a receipt printed by a portable printer in front of you. See the example to the right. You have the right to ask for such a receipt to avoid paying two times.
- The money that they collect will support the efforts of the provincial government to secure the province, to kickstart economic development, and to protect the well being of the population of Kasaï Central.
- If you have any questions or complaints, please contact 0827316243 or 0974982998. These are the telephone lines of Harvard-RDC, an independent NGO of scientific researchers who will transmit your messages to the leaders of the DGRKOC and to the governor. They will keep your identity confidential.

EXAMPLE RECEIPT

PROVINCE DE KASAI CENTRAL
Ville de Kananga
DGRKOC

QUITTANCE N 001TCK1000001

PROPRIETAIRE :
NOM : Mutombo
POSTNOM : Dikembe
PRENOM : Jean-Jacques

BIEN TAXE :
IMMOBLIER

SUPERFICIE:
Batie: 20m²
Non batie: 10m²

ADRESSE:
Ville : Kananga
Commune : Kananga
Quartier : Malanji
Avenue : Goma

IMPOSITION/TAXATION:
Impôt Foncier
Forfait
MONTANT PERCU: 2.000 FC

Designed by Hologram (HIDS)

Figure 4: Treatment flier for information intervention.

NOTICE

Please take note of the following information:

- The DGRKOC collectors will start to collect property and rental taxes this year. They might come to your household for this reason in the following months.

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Figure 5: Control flier for information intervention.

2.1 Other payments to state officials in Kananga

Payment of bribes could create another possible channel through which the program might affect political behavior, as citizens are likely to update their beliefs and expectations about the government in different ways after paying a bribe versus paying a tax (or paying nothing at all). If the program caused an average increase in bribes, for example, citizens might update negatively about the professionalism of the provincial government. To rule out this type of concern, this section demonstrates that the program does not appear to have coherent effects on bribe payment.

Two types of bribes are plausible in this context. First, households might pay the collector a smaller amount than the tax, $b < \tau_1$, where τ_1 in this case is the flat tax rate of 2,000 CF. The collector might accept b in exchange for a promise not to enforce the true rate for the rest of the tax period. The clearest way to measure such bribes is through household self-reports using local codes for bribes. This type of bribe is typically known as paying the "transport" of the tax collector. Alternatively, individuals might speak of making an "arrangement" with the tax collector.[1] The measure of bribe self reports, *Paid bribe*, takes the value of 1 if a participant responds affirmatively to either of these questions. The second way to pay a bribe is to pay the collector $\tau_1 + b < \tau_2$, where τ_2 here is the flat tax rate of 6,600 CF. That is, a nicer downtown household that owes 6,600 CF pays the 2,000 CF rate plus a bribe in exchange for "reclassifying" the house to a lower tax rate. *Paid bribe* equals 1 in such cases of reclassification bribes, as well. We also consider effects on the intensive margin, employing the self-reported amount paid in bribes, *Bribe amount*, as the dependent variable.

Measurement error is always a concern when asking about bribes. However, paying small bribes like these is not taboo in this context. In another project on bribe payment at Kananga's roadway tolls, up to 50% of participants openly told enumerators that they bribed the toll officer to avoid paying the full amount (Reid and Weigel (2017)). Nonetheless, to assuage concerns about a self-reported bribe measure, two other measures of bribes will be considered as dependent variables. First, *Others bribe* is the perceived frequency of bribe payment among other households on the respondent's street. As with many of the survey-based measures used in this paper, *Others bribe* is standardized to facilitate interpretation of the magnitudes of estimated coefficients. Second, *Going rate* is the respondent's estimate for the 'going rate' of bribes: how much would you have to give the tax collector so that he/she will pass to the next house? These measures of bribes are analogous to those used in Khan et al. (2015).

Table 2 shows the average effects of the program on bribe payment. No coherent pattern emerges. Although the point estimate on *Program* is positive and significant when *Others bribe* is the dependent variable, suggesting perhaps an increased perception that other people are paying bribes, the corresponding estimate for the going rate of bribes is not significant. Nor are the point estimate for the household bribe payment indicator. There is even a marginally significant decrease in reported bribe amounts due to the program. Further evidence comes from considering participants' beliefs about why many people in Kananga do not pay the property tax. Of the seven reasons evaluated by participants, bribe payment was considered the least important (see Figure 8), reinforcing the plausibility of the low measured incidence of bribes in this setting.

Some readers thinking of Congo, a paradigmatic 'kleptocracy', might be puzzled by this null

[1] Other local codes for bribes include giving the collector a "coffee," "tea," "beer," and "water."

Table 2: No coherent effect on bribe payment

	Paid bribe	Bribe amount	Others bribe	Going rate
Program	0.000	-23.856*	0.091*	7.192
	(0.006)	(12.628)	(0.048)	(49.964)
Covariates	Yes	Yes	Yes	Yes
Stratum FE	Yes	Yes	Yes	Yes
R^2	0.017	0.016	0.051	0.070
Observations	2913	2913	2046	2566
Clusters	356	356	343	356
ControlMean	0.023	36.345	-0.023	710.341

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: *Paid bribe* is an indicator for individuals' self-reported bribe payments using local codes for bribes. It also equals 1 in the case of 'reclassification' bribes. *Bribe amount* is self reported amount paid in bribes. *Others bribe* is a standardized variable increasing in the perceived frequency that one's neighbors are paying bribes instead of the property tax. *Going rate* is the estimated amount of money (the 'going rate') that it would take to bribe a tax collector in lieu of paying the property tax.

result.[2] However, two points about the context make the null effects on bribes understandable. First, collectors have little coercive power in this context. This is most clearly exhibited by the low compliance rate (about 11%) in program polygons. Although there is evidence that differences in the perceived probability of sanctions of tax evaders explains some of the variation in compliance, by far the modal response to receiving tax collectors at one's door was not to pay.

Second, this bribe-payment scenario differs from the typical case in which a citizen demands a service—an official document, or passage through a toll, for example—from a bureaucrat. In such settings, paying a bribe can be less costly than paying the full price for the service; it can also simply speed up the process and cut through bureaucratic red tape (Banerjee et al. (2012)). However, in this case, the citizen does not demand anything from the tax collector. If the citizen deems the probability of punishment for evasion lower than some threshold based on his risk preferences, he chooses to evade. Moreover, in the typical case, the bureaucrat typically with lower opportunity cost of time than the citizen. The bureaucrat can strategically delay or threaten other procedures and feeds — endogenous red tape — to increase the likelihood that the citizen will pay a bribe to speed up the process. In this setting, by contrast, it is the citizen who has the lower cost of time, while the collector is charged with tax collection for hundreds of other houses in the polygon. The citizen may even employ the same delay strategy to *avoid* paying the collector. Given these differences from the standard bribe-payment set up, it is not surprising that we see low rates of bribes paid across control and program polygons.

[2]In fact, I anticipated an increase in bribe payment in my pre-analysis plan, and I implemented two cross-randomized anticorruption interventions to try to reduce bribe payment in certain polygons (described in Section 2). It is worth noting, however, that an alternative explanation for the low rate of bribes is that collectors did not trust or understand which polygons would be 'audited' and which polygons would not be audited. Independent audits of tax collection was one of the cross-randomized anticorruption interventions. They were conducted in half of the program polygons. Which polygons were to be audited was known to collectors in advance: on their assignment sheets, next to the name of the polygon was a column showing the audit status - 'yes' or 'no'. However, if collectors simply assumed every polygon would be audited and so reduced bribe taking in all polygons, this could also explain the null result on bribes.

As for other formal and informal payments made to the state in Congo, enumerators administered a survey module asking respondents about a series of such payments. The exact question text was as follows: "Now, outside of the property tax campaign of 2016, I'd like to ask you about other payments that citizens pay to the state here in Kananga. By this, I mean formal payments (such as taxes, fees, and other payments for official documents) and informal payments (such as small amounts of money given to officials for transport, water, coffee, tea, etc). In 2016, did you make any other formal or informal payments to the state?" Enumerators then asked respondents individually about each of the following taxes or fees: vehicle tax, rental tax, capital tax, income tax, any transportation tax, authorization for selling alcohol, tobacco, cement, or sugar, authorization for pharmacies, mining tax, toll tax, authorization for urban transport, commercial fee for raising or selling animals, commercial fee for the sale of agricultural products, commercial authorizations, motorcycle tax, vender permit, insurance permit. Again, estimated rates of payment of formal and informal payments to state officials are lower than those reported in other work, such as Paler et al. (2016). Only 8.8% of the sample said they made any such payments in 2016. The most common payments are vender permits and the motorcycle tax. Among those who say they made other formal or informal payments to the state in 2016, the median respondent paid about $15. However, if you include all those who said they did not make any such payments, the median drops to $0.

2.2 Additional information on property tax compliance

This section provides more information about tax compliers — that is, individuals who were moved to pay the property tax because of the program. A complete treatment is beyond the scope of this paper but addressed in a companion paper (Weigel (2017)). First, Table 3 contains the raw data on tax compliance. We can see the roughly 10 percentage point increase across treatment and control polygons.

Table 3: Tax payment in endline sample

	Nonpayers	Payers	Compliance
Control	1428	8	0.55%
Program	1915	228	10.63%
Total	3353	236	6.58%

Notes: Payment rates among endline participants in polygons assigned to the tax collection program or assigned to control.

To characterize tax compliers, Figure 6 plots the coefficients of linear regressions of a range of standardized respondent characteristics on a tax payment indicator in a sample restricted to program polygons. For a table showing the magnitudes of these differences using non-standardized versions of these variables, see Table 4. Normally, a simple comparison like this is fraught by the fact that the complier population is an unobserved mix of compliers and always-takers. However, given that the payment rate in control polygons is not statistically different from zero, we can assume away the existence of always-takers in this setting, which makes this comparison within program polygons valid.[3] These analyses reveal that tax compliers are more likely to be male, educated, wealthy, employed, and to work for the government in some capacity.

Figures 7 and 8 contain endline survey evidence about the perceived reasons why individuals in Kananga do and do not pay the property tax, respectively. The reasons deemed most important include (i) avoiding punishment, (ii) doing one's duty as a citizen, and (iii) promoting the development of the province. Concerning why many people in Kananga do not pay the tax, the reasons deemed most important include (i) that the government provides too little in the way of public goods to justify tax payment, and (ii) people have no money to pay the tax.

Individuals' prior beliefs, measured at baseline, also affect the probability that they comply with the property tax. Individuals who perceive a higher ex ante risk of punishment are more likely to pay, as are individuals who view the government as a more credible provider of public goods. These results support models of tax compliance that emphasize a simple cost-benefit analysis of whether to pay taxes. However, "tax morale" appears to play an equally large, if not larger, role in citizens' decisions whether or not to pay taxes (Luttmer and Singhal (2014)). Social pressure, on the other hand, does factor into the tax compliance function — an unsurprising fact given that social norms about payment likely take time to form. For a more complete exploration of compliance in this setting, see Weigel (2017).

[3] In Weigel (2017), to relax this assumption, I also report complier ratios in the spirit of Abadie (2003)'s κ-weighting method.

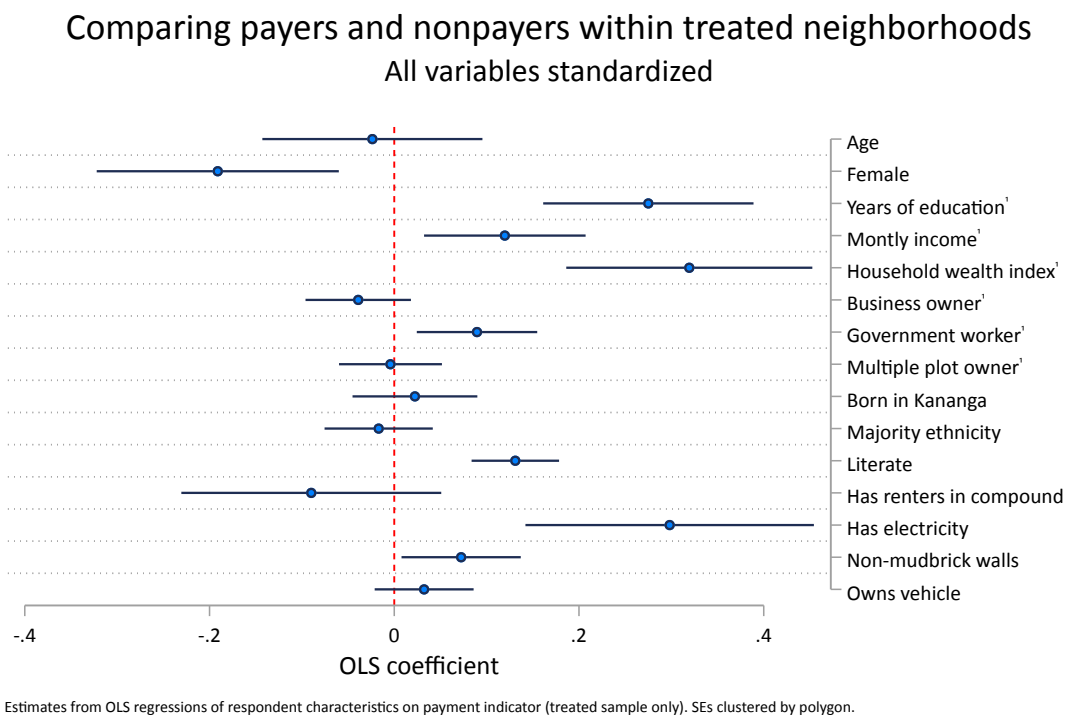

Figure 6: Complier characteristics: linear regressions of respondent characteristics on a tax payment indicator.

Table 4: Complier characteristics

Variable	β
Gender	-0.0769**
Age	-0.156
Majority ethnicity	-0.0168
Born in Kananga	0.0211
Years of education	1.178**
Earnings last month	0.116*
Wealth Index	0.394***
Non-mudbrick house	0.124***
Unemployed	-0.0769**
Business owner	-0.0402
Work for government	0.0835**
Voted in 2011	0.00385

Notes: Regressions of respondent characteristics on a payment indicator among individuals living in program polygons only.

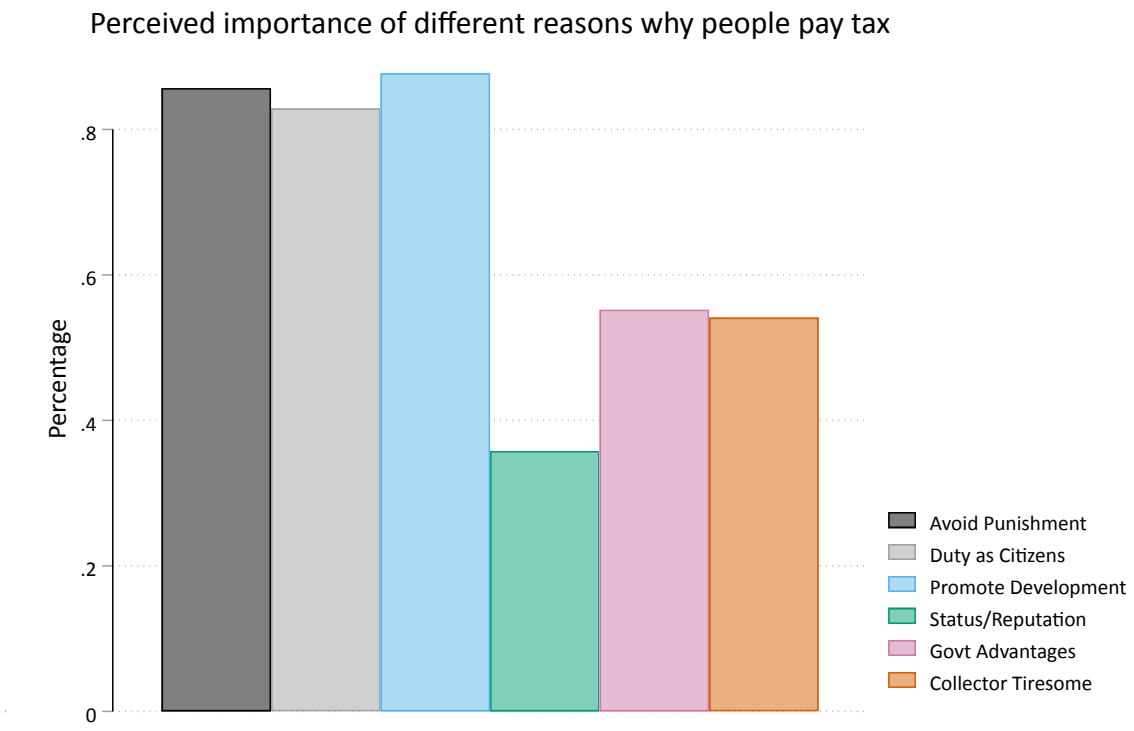

Figure 7: Percentage of respondents who deemed the above reasons 'very important' or 'important' in explaining why some people pay the property tax.

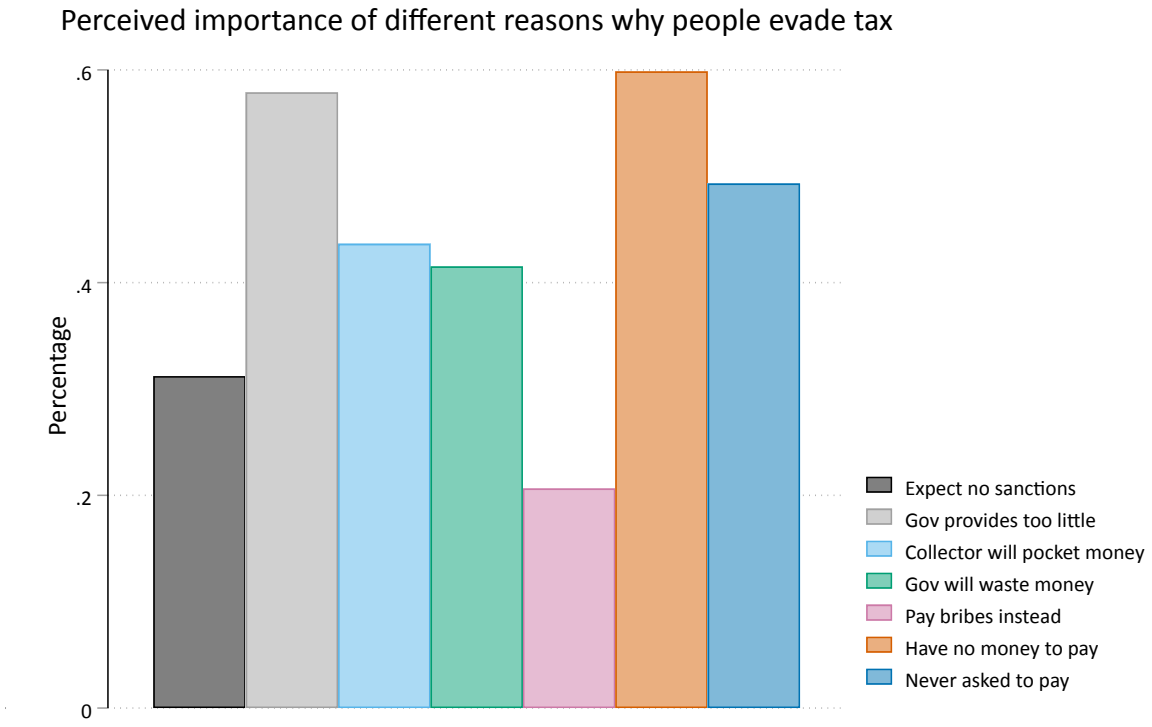

Figure 8: Percentage of respondents who deemed the above reasons 'very important' or 'important' in explaining why some people evade the property tax.

2.3 Kamuina Nsapu militia activity in Kananga

In August 2016, a clash between the national police and a customary chief in Dibaya territory led to the death of the chief and the beginning of the Kamuina Nsapu militia movement. Although the group's demands were triggered by local grievances, very shortly the Kamuina Nsapu evolved into a broader protest movement against the national government. In December 2016, President Joseph Kabila did not step down at the end of his constitutionally mandated term. Protests shook Kinshasa and many cities across Congo, and the Kamuina Nsapu took up arms with a vengeance. A cycle of tit-for-tat violence between the army and the Kamuina Nsapu left thousands dead and hundreds of thousands displaced.[4]

These unfortunate events do not affect the internal validity of the research design, as the randomization nets out any broader trends that affect the city as a whole. But data collection was more difficult as a result. In particular, the research team could not administer endline surveys in one commune (Nganza), representing approximately 16.4% of the intended sample, in which the conflict was most acute.[5] This loss of sample means the analysis is not powered as anticipated.

The conflict must also inform the interpretation of the external validity of results concerning attitudes toward the provincial government. Although directives to the military and police come from the national government according to the official chain of command, citizens also blame the provincial government for the conflict that marred the province. My prior is that the instability would lead causal effects of the tax program to be more muted. With the threat of violence top of mind, changes in beliefs induced by the tax program may be less salient. But it is also possible to imagine the violence interacting with the effects of the tax program in other ways, too. As with all randomized controlled trials, the reported results should be taken as valid in this context only; further research is needed to make clear statements about external validity.

[4] ReliefWeb, "Briefing: The conflict in Kasai, DRC." July 31, 2017. See `http://reliefweb.int/report/democratic-republic-congo/briefing-conflict-kasai-drc`.

[5] This commune is home to many migrants from Dibaya, where the Kamuina Nsapu movement originated. As such, it has been the focal point of the conflict in Kananga, even though the majority of the violence occurred in rural areas outside the city.

2.4 Sampling and Probability Weights

As noted in Section 4 in the paper, the endline sample consisted of two subsamples.

1. *House quality sample*: Participants selected randomly during the screening survey and then sampled with higher probability because their houses were of higher-than-average quality for the polygon.
2. *Random sample*: Participants selected randomly during the screening survey and then randomly selected again for the endline survey.

Field-based random sampling for the screening survey was achieved by assigning enumerators to skip patterns to follow in the polygon: e.g. visit every X^{th} house, where X was calculated using an estimate of the total number of compounds in the polygon to arrive at a roughly even number of total surveys per polygon (20 for the endline screening survey). Enumerators followed the skip pattern until they walked up and down every street in a polygon, often exceeding the target number of surveys.

After enumerators had randomly administered roughly 20 screening surveys, recording basic household attributes and the eligibility of potential participants, I selected a subsample of eligible participants in Stata. Relatively higher quality houses (e.g. those built with modern materials other than mudbricks) were selected with somewhat higher probability to enable subsequent analysis exploiting heterogeneity by house quality, as pre-registered in the analysis plan. Such houses are relatively scarce in Kananga, so they were sampled with higher probability to ensure enough would appear in the sample to enable the heterogeneity analysis. In addition, 2-5 random draws were also added to the subsample in every polygon. Rules for sub-sample selection are summarized in Table 5.

Specifically, for each potential respondent in the screening survey sample, I calculated a house quality index based on objective characteristics of the compound—the roof, walls, the number of total buildings, and the accessibility to a primary or secondary avenue—and the subjective assessment of house quality conditional on the polygon.[6] The top k participants (by estimated house quality) were added to the subsample, where k is given by the second column of Table 5, the "household quality sample." Among the remaining potential respondents in the screening survey sample, l were chosen, where l is given by the third column in Table 5, the "endline random sample."[7] Because the higher quality houses have already been chosen, the average house quality will be lower in this third subsample.

In addition to the endline sample, enumerators sought out eligible baseline participants at endline. Baseline participants were eligible if they were both property owners and household heads (or their spouses).[8] Within this baseline repeat sample, attrition was 49.8%. High attrition in this tracked

[6] I included subjective house quality to account for subtle variation in house quality that will not be picked up by coarse measures such as whether the roof is made of sheet metal or cement.

[7] The complete Stata script will be available among the replication files on my website upon publication.

[8] The baseline survey was conducted with property-owners and renters because initially the campaign had intended to include collection of both the property tax and the rental tax. However, the rental tax was dropped for the first half of the campaign because the tablet application could not issue the appropriate receipts. When it was reintroduced, collectors devoted little time to this tax. Indeed, rental tax receipts account for less than 5% of total revenues generated by the tax campaign. Moreover, the ultimate liability of the rental tax is uncertain. By law, renters are supposed to deduct 20% of monthly rent and pay this sum to the government. However, often landlords insist that the renter pay the full rent, the rental tax deduction notwithstanding. As such, although by law the

sample chiefly reflects the fact that the conflict in Kasaï caused considerable migration within and from Kananga in the 10-15 months between the baseline and endline surveys.[9] Relative to attritors, baseline participators found at endline are more likely to be male, educated, to have higher-than-average monthly income, to work for the government, to know the name of the tax ministry, to report past household visits from tax collectors, to report high levels of political participation, and to report low levels of perceived government corruption (see Figure 11). They are also more likely to hail from treated polygons (see Paper Appendix Figure 10). These systematic differences are concerning because they are indicative of a process of endogenous selection. However, this sample will be only be considered in secondary analyses that hinge on the time dimension.

Table 5: Choosing the subsample of endline participants

Repeat baseline sample	House quality sample	Random sample	Total
5	7	2	14
4	7	3	14
3	8	3	14
2	8	4	14
1	9	4	14
0	9	5	14

Notes: Schedule of participants from house quality sample and endline random sample, according to the number of repeat baseline participants per polygon.

The result of this procedure is a slightly higher proportion of relatively wealthier houses in the endline sample. Figure 9 demonstrates this shift graphically: the endline sample is slightly to the right of the full screening survey sample in the house quality index described in the previous paragraph.

Because of this sampling process, and because we sample roughly the same number of individuals from polygons with different total populations, the (unweighted) estimates reported in the paper are not fully representative of Kananga, but rather for a slightly better-off sub-population of the city. In the robustness tables that follow, however, we include specifications with probability weights to account for the higher proportion of relatively wealthy individuals in the endline sample.

Weights are constructed in two steps. First, for each individual i with house quality x in polygon j, we estimate a weight, w_{ij}^{within}, to adjust for the higher selection probability for relatively high quality houses:

$$w_{ij}^{within} = \frac{f_j^{pop}(x_i)}{f_j^{samp}(x_i)} \tag{1}$$

where $f_j^{pop} \sim N(\mu_j^{pop}, \sigma_j^{pop})$, $f_j^{samp} \sim N(\mu_j^{samp}, \sigma_j^{samp})$, and the μ_j's and σ_j's reflect polygon-level empirical means and standard deviations, respectively.[10] Second, a between-polygon weight is

incidence of the tax falls on landlords, in practice it may fall on renters. Moreover, essentially no private individuals make this payment, nor are they solicited by the government for it. Rental taxes are only enforced among shops and businesses in downtown Kananga. For all of these reasons, renters were excluded from the analysis, as specified in the analysis plan. We seek to estimate the effect of the program on the population of property owners in Kananga.

[9] Another common cause of attrition involved baseline respondents who were not the household head (or spouse) but another member of the household head's family. I excluded these individuals so that re-sampling of baseline participants would be analogous to sampling procedures used to construct the endline sample.

[10] I tried using the empirical densities rather than relying on parametric assumptions, but the resulting weights had large numbers of extreme values. Imposing a normal distribution on polygon-level house quality is at least

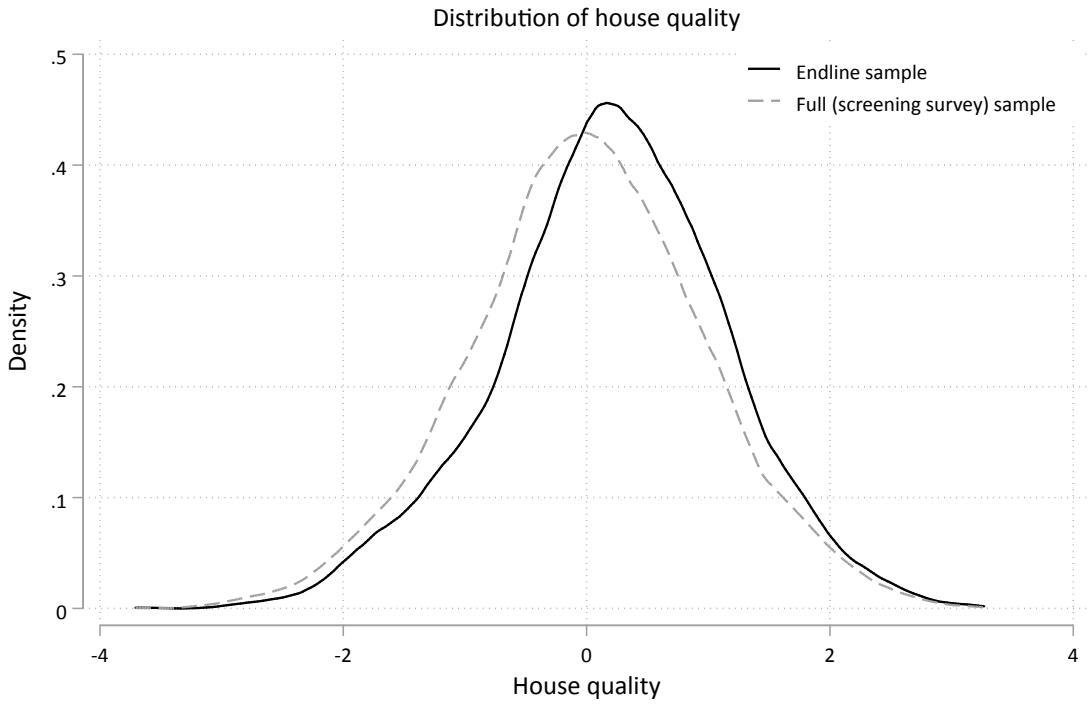

Figure 9: Densities of estimated house quality for the endline sample and the full screening survey sample.

constructed to account for the fact that the number of individuals in the endline sample is (roughly) constant across polygons but polygons themselves have different numbers of property owners. This weight is simply:

$$w_j^{between} = \frac{n_j^{screening}/N}{n_j^{endline}/n} \tag{2}$$

where N is the total number of property owners in Kananga, and n is the total number of property owners in the endline sample. The two weights are then multiplied together and normalized to generate a probability weight that is used in regressions in Section 3. Figure 10 shows the distributions of the ultimate weights. As expected, individuals in the "endline random sample" receive the most weight because they are on average of lower house quality and thus underrepresented in the endline sample. By contrast, the "household quality sample" receives the least weight because these high-house-quality individuals are overrepresented in the endline sample. Using these weights in the main analyses does not substantially alter the results. However, for completeness, every robustness table that follows contains a specification with weighted estimates.

justified by the empirical distributions of house quality taken in the full endline and screening survey samples (Figure 9).

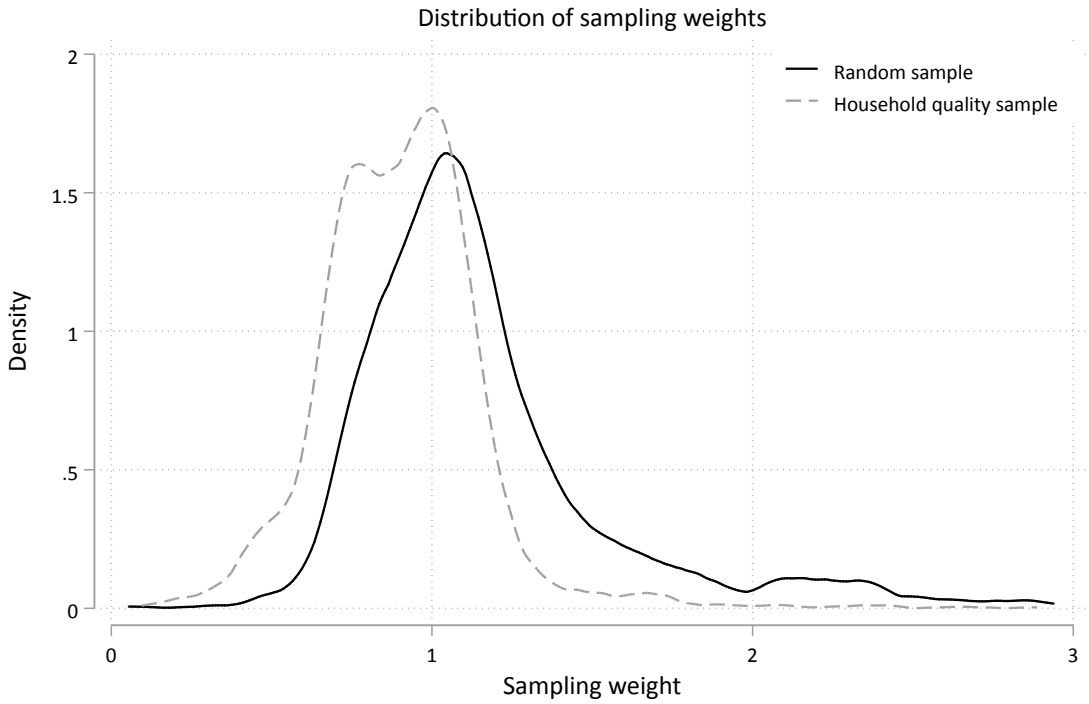

Figure 10: Distributions of the weights for the three subsamples of the endline sample.

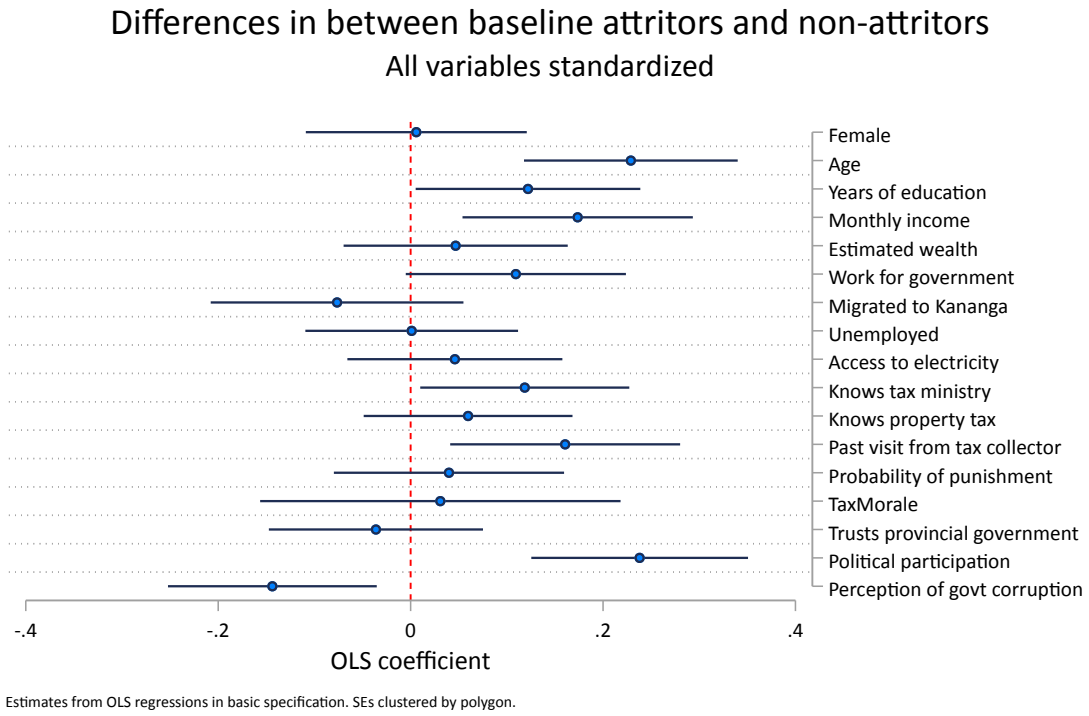

Figure 11: Differences in observables between attritors and non-attritors in repeat baseline sample.

3 Robustness checks

This section reports results from OLS estimations of Equation 1 in the paper for all of the dependent variables considered in the paper. Robustness checks include the following specifications (with and without house quality interactions):

1. **Only the three basic covariates** (gender, age, age squared). These covariates are indicated as *Covs basic* in the robustness tables.

2. **All covariates listed in the pre-analysis plan.** This includes the four covariates (business owner status, estimated wealth, polygon-level availability of public lighting, polygon-level past visits from collectors) found to have slight imbalance, as discussed in paper Section 7. These covariates are indicated as *Covs imbalance* in the robustness tables. Finally, the other 22 covariates discussed in the paper are also included, indicated as *Covs additional*.

3. **Enumerator fixed effects.** Because the enumerator's comportment could influence how participants understand and interpret survey questions, the third column of each table adds fixed effects for the 15 enumerators who worked on the endline survey.

4. **Sampling weights** (as discussed in the previous section). Estimates in the fourth column of the following tables can be considered representative of all property owners in Kananga.

5. **Interactions with house quality.** To shed light on the mechanisms linking taxation and participation, the last specification investigates heterogeneity by wealth, as pre-registered in the analysis plan. In particular, the signal about the government sent by the tax program may be stronger among individuals with less prior contact with the government. Baseline data reveal that less wealthy individuals are a clearly defined subgroup with less past exposure to the state.[11] Exploring heterogeneity by this dimension therefore sheds light onto the applicability of this mechanism in the present context. For simplicity, I use a binary measure of wealth (*House quality*) that equals 0 if a house is constructed with mud bricks (56% of the sample) and 1 if a house is constructed with fired bricks, cement, or any other modern material (44% of the sample). The fifth column always contains the p-value from an F test of the hypothesis that both the coefficient on *Program* and *ProgramXHouse* are equal to zero.

The variable name used in the paper is shown in the title of each table. In addition to variable-specific robustness tables, other tables and figures that also function as robustness checks are interspersed in the follow sections according to the topics under consideration. Specifically, for each index considered in the paper, the corresponding subsection contains a coefficient plot summarizing regressions (in the basic specification) using each individual constituent survey question as the dependent variable.

[11] Specifically, individuals who are below median in a household wealth index (constructed using the observed quality of the roof, toilets, floor, access to electricity, and ownership of a vehicle) are 4.5 percentage points less likely to report ever seeing government agents in their neighborhood. They are 3.4 percentage points less likely to know the full name of the provincial governor, and 10 percentage points less likely to know the name of the provincial tax ministry. These magnitudes increase considerably among even less wealthy segments of the population (e.g. the bottom quartile of the wealth distribution).

3.1 Robustness checks for paper Section 8.1: Did the tax campaign increase tax payment?

Table 6: *Visited by collectors* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.640***	0.639***	0.631***	0.633***	0.653***
	(0.017)	(0.018)	(0.017)	(0.019)	(0.022)
ProgXHouse					-0.024
					(0.033)
House quality					-0.015
					(0.028)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.411	0.424	0.433	0.407	0.418
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	0.164	0.164	0.164	0.164	0.164
Weights	No	No	No	Yes	No
Ftest					0.000

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is an indicator for households reporting at least one visit by tax collectors in 2016.

Table 7: *Paid property tax* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.110***	0.106***	0.109***	0.106***	0.091***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)
ProgXHouse					0.042**
					(0.018)
House quality					-0.035***
					(0.010)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.076	0.091	0.095	0.084	0.087
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	0.006	0.006	0.006	0.006	0.006
Weights	No	No	No	Yes	No
Ftest					0.000

Standard errors clustered by polygon. $^{*}p < 0.1$,** $p < 0.05$,*** $p < 0.01$.

Notes: the dependent variable indicates payment of the property tax in 2016.

3.2 Robustness checks for paper Section 8.2: Testing the tax-bargaining hypothesis

Table 8: Main results: interactions with house quality

	Townhall attendance		Suggestion card submission		Townhall or suggestion		Townhall and suggestion		Costly participation index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Program	0.044**	0.055**	0.026**	0.033**	0.049***	0.057***	0.028***	0.038***	0.144***	0.179***
	(0.020)	(0.024)	(0.012)	(0.015)	(0.016)	(0.021)	(0.009)	(0.012)	(0.043)	(0.053)
ProgXHouse		-0.024		-0.015		-0.018		-0.022		-0.076
		(0.036)		(0.023)		(0.029)		(0.016)		(0.074)
House quality		0.010		0.008		0.018		0.019		0.070
		(0.030)		(0.020)		(0.024)		(0.013)		(0.060)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stratum FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.062	0.062	0.055	0.055	0.067	0.067	0.038	0.039	0.070	0.070
Observations	1934	1932	2912	2910	2913	2911	2913	2911	2913	2911
Clusters	252	252	356	356	356	356	356	356	356	356
Control Mean	.18	.18	.1	.1	.18	.18	.035	.035	-.057	-.057
F-test (p)		.057		.071		.0086		.0047		.0017
RI p (Program)	0.0344	0.0098	0.0446	0.0102	0.0050	0.0008	0.0040	0	0.0012	0
RI p (ProgXHouse)		0.9902		0.9812		1		1		1

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$. p-value of interaction F test shown.

Notes: *Townhall attendance* is an indicator variable that equals 1 if a participant attended a townhall meeting. *Suggestion card submission* is an indicator variable that equals 1 if a participant submitted his or her suggestion card. *Costly participation index* is a standardized index of two indicator variables that equal 1 if a participant (1) turned up at a townhall meeting, or (2) submitted a suggestion card, respectively. *Townhall or suggestion* indicates that a participant attended either a townhall meeting or submitted a suggestion card. *Townhall and suggestion* indicates that a participant attended a townhall meeting and submitted a suggestion card.

Table 9: Attendance at townhall and submission of suggestion card (controlling for distance to respondents' households)

	Townhall attendance		Suggestion card submission		Costly participation index		Townhall or suggestion		Townhall and suggestion	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Program	0.044**	0.054**	0.025**	0.032**	0.144***	0.180***	0.049***	0.058***	0.028***	0.038***
	(0.020)	(0.024)	(0.012)	(0.015)	(0.043)	(0.053)	(0.016)	(0.021)	(0.010)	(0.012)
Distance	-0.008	-0.008	-0.014*	-0.014*	-0.016	-0.017	-0.016	-0.017	0.008	0.008
	(0.014)	(0.014)	(0.008)	(0.008)	(0.028)	(0.028)	(0.011)	(0.011)	(0.006)	(0.006)
ProgXHouse		-0.024		-0.016		-0.077		-0.019		-0.021
		(0.036)		(0.023)		(0.074)		(0.029)		(0.016)
House quality		0.010		0.008		0.071		0.019		0.019
		(0.031)		(0.020)		(0.060)		(0.024)		(0.013)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stratum FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.062	0.062	0.056	0.056	0.070	0.070	0.068	0.068	0.039	0.040
Observations	1925	1923	2903	2901	2904	2902	2904	2902	2904	2902
Clusters	251	251	355	355	355	355	355	355	355	355
Control Mean	0.185	0.185	0.101	0.101	-0.057	-0.057	0.178	0.178	0.035	0.035
F-test (p)		0.064		0.079		0.002		0.009		0.005

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$. p-value of interaction F test shown.

Notes: *Townhall attendance* is an indicator variable that equals 1 if a participant attended a townhall meeting. *Suggestion card submission* is an indicator variable that equals 1 if a participant submitted his or her suggestion card. *Costly participation index* is a standardized index of two indicator variables that equal 1 if a participant (1) turned up at a townhall meeting, or (2) submitted a suggestion card, respectively. *Townhall or suggestion* indicates that a participant attended either a townhall meeting or submitted a suggestion card. *Townhall and suggestion* indicates that a participant attended a townhall meeting and submitted a suggestion card. *Distance* is the average Euclidean distance from respondents' households to the Provincial Assembly building and to the suggestion card drop box. As shown in Figure 12 in the paper, these locations are fairly close together in the downtown part of Kananga. Thus the average distance is a meaningful control variable. Results are nearly identical if we consider each outcome individually, controlling for distance to the corresponding location (i.e. controlling for distance to the Provincial Assembly building for townhall attendance).

Table 10: Attendance at townhall and submission of suggestion card (cluster-level analysis)

	Townhall meeting attendance (1)	Suggestion card submission (2)	Townhall or suggestion (3)	Townhall and suggestion (4)	Costly participation index (5)
Program	0.036	0.018	0.041**	0.025**	0.125***
	(0.022)	(0.013)	(0.017)	(0.010)	(0.045)
Stratum FE	Yes	Yes	Yes	Yes	Yes
R^2	0.165	0.146	0.167	0.109	0.167
Observations	252	356	356	356	356
Control Mean	.17	.1	.17	.035	-.077

Robust standard errors. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: *Townhall attendance* is an indicator variable that equals 1 if a participant attended a townhall meeting. *Suggestion card submission* is an indicator variable that equals 1 if a participant submitted his or her suggestion card. *Costly participation index* is a standardized index of two indicator variables that equal 1 if a participant (1) turned up at a townhall meeting, or (2) submitted a suggestion card, respectively. *Townhall or suggestion* indicates that a participant attended either a townhall meeting or submitted a suggestion card. *Townhall and suggestion* indicates that a participant attended a townhall meeting and submitted a suggestion card.

Table 11: *Townhall attendance* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.042**	0.035*	0.053***	0.040*	0.055**
	(0.020)	(0.021)	(0.019)	(0.020)	(0.024)
ProgXHouse					-0.024
					(0.036)
House quality					0.010
					(0.030)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.058	0.076	0.093	0.061	0.062
Observations	1934	1890	1934	1934	1932
Clusters	252	247	252	252	252
ControlMean	0.185	0.185	0.185	0.185	0.185
Weights	No	No	No	Yes	No
Ftest					0.057

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable indicates that a participant attended a townhall meeting.

Table 12: *Suggestion card submission* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.022*	0.021*	0.026**	0.029**	0.033**
	(0.012)	(0.012)	(0.012)	(0.013)	(0.015)
ProgXHouse					-0.015
					(0.023)
House quality					0.008
					(0.020)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.052	0.073	0.062	0.051	0.055
Observations	2912	2813	2912	2912	2910
Clusters	356	345	356	356	356
ControlMean	0.101	0.101	0.101	0.101	0.101
Weights	No	No	No	Yes	No
Ftest					0.071

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable indicates that a participant submitted a suggestion card.

Table 13: *Costly participation index* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.144***	0.136***	0.157***	0.144***	0.179***
	(0.042)	(0.044)	(0.042)	(0.044)	(0.053)
ProgXHouse					-0.076
					(0.074)
House quality					0.070
					(0.060)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.067	0.084	0.089	0.066	0.070
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	-0.057	-0.057	-0.057	-0.057	-0.057
Weights	No	No	No	Yes	No
Ftest					0.002

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable is a standardized index of two indicator variables that equal 1 if a participant (1) turned up at a townhall meeting, or (2) submitted a suggestion card, respectively.

Table 14: *Townhall or suggestion* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.049***	0.047***	0.052***	0.046***	0.057***
	(0.016)	(0.017)	(0.016)	(0.017)	(0.021)
ProgXHouse					-0.018
					(0.029)
House quality					0.018
					(0.024)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.063	0.083	0.086	0.062	0.067
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	0.178	0.178	0.178	0.178	0.178
Weights	No	No	No	Yes	No
Ftest					0.009

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable indicates that a participant attended either a townhall meeting or submitted a suggestion card.

Table 15: *Townhall and suggestion* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.028***	0.026***	0.032***	0.031***	0.038***
	(0.009)	(0.010)	(0.009)	(0.010)	(0.012)
ProgXHouse					-0.022
					(0.016)
House quality					0.019
					(0.013)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.037	0.047	0.051	0.042	0.039
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	0.035	0.035	0.035	0.035	0.035
Weights	No	No	No	Yes	No
Ftest					0.005

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable indicates that a participant attended a townhall meeting and submitted a suggestion card.

Table 16: *Critical suggestion card* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.020*	0.018*	0.021**	0.025**	0.039***
	(0.010)	(0.010)	(0.010)	(0.011)	(0.014)
ProgXHouse					-0.036*
					(0.020)
House quality					0.009
					(0.018)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.045	0.069	0.056	0.044	0.049
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	0.078	0.078	0.078	0.078	0.078
Weights	No	No	No	Yes	No
Ftest					0.024

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is an indicator variable for individuals who submitted a suggestion card that was critical of the government (determined by the respondent's choice to check the box "I want the provincial government of Kasai Central to do a better job" on the card).

Table 17: *Written-in suggestion* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.018**	0.019**	0.022**	0.018**	0.023**
	(0.008)	(0.009)	(0.009)	(0.008)	(0.011)
ProgXHouse					-0.008
					(0.017)
House quality					0.000
					(0.014)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.033	0.051	0.045	0.032	0.038
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	0.033	0.033	0.033	0.033	0.033
Weights	No	No	No	Yes	No
Ftest					0.043

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is an indicator for respondents who dropped off cards with written-in suggestions for the government in addition to the five multiple-choice questions filled out by everyone (see Figure 13 in the paper)

Table 18: *Govt responsibility: Index of all questions* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.098*	0.117**	0.035	0.117**	0.101
	(0.051)	(0.052)	(0.041)	(0.051)	(0.063)
ProgXHouse					0.029
					(0.086)
House quality					-0.110
					(0.075)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.038	0.055	0.121	0.042	0.042
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	-0.066	-0.066	-0.066	-0.066	-0.066
Weights	No	No	No	Yes	No
Ftest					0.084

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is increasing in the perception that the provincial government should be a primary provider of public goods in Kananga. It is a standardized index based on the variables that makeup the dependent variables of the next two tables (described in their corresponding table notes).

Table 19: *Govt responsibility: Sector-based questions* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.071	0.097*	0.015	0.080	0.068
	(0.053)	(0.054)	(0.042)	(0.054)	(0.067)
ProgXHouse					0.046
					(0.090)
House quality					-0.086
					(0.079)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.040	0.057	0.128	0.044	0.043
Observations	2813	2718	2813	2813	2811
Clusters	356	345	356	356	356
ControlMean	-0.051	-0.051	-0.051	-0.051	-0.051
Weights	No	No	No	Yes	No
Ftest					0.219

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is an index increasing in the degree to which participants chose the provincial government as the main provider of public goods across the following sectors: schools, water system/wells, health care, keeping people safe, helping poor people, economic development, road maintenance. The other possible providers were: national government, NGOs, community organizations, religious groups/leaders, traditional leaders/chiefs, international organizations, everyone should take care of themselves.

Table 20: *Govt responsibility: Hypothetical questions* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.090**	0.077*	0.069*	0.122***	0.106*
	(0.040)	(0.041)	(0.040)	(0.042)	(0.056)
ProgXHouse					-0.038
					(0.078)
House quality					-0.088
					(0.064)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.028	0.037	0.061	0.033	0.032
Observations	2900	2801	2900	2900	2898
Clusters	356	345	356	356	356
ControlMean	-0.053	-0.053	-0.053	-0.053	-0.053
Weights	No	No	No	Yes	No
Ftest					0.088

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable is an index increasing in the degree to which participants deem the provincial government the principal provider of public goods in three survey questions asking participants to choose between the following competing viewpoints. (1) Agreement with 'Some people say the provincial government should take more responsibility to ensure that everyone is provided for' OR 'Other people say that people should take more responsibility to provide for themselves.' (2) Agreement with 'Foreign aid is necessary for Congo to become peaceful and prosperous.' OR 'Foreign aid is not necessary in Congo; we have everything we need to achieve peace and prosperity.' (3) Agreement with 'Foreign aid organizations should provide more services in the health and education sectors in Congo.' OR 'Foreign aid organizations should provide fewer services like health care and education; that is the responsibility of the provincial government.'

Table 21: *Costly participation index* - AES coefficients

	(1)	(2)	(3)	(4)
AES (Program)	0.072**	0.066**	0.068**	0.088***
	(0.034)	(0.034)	(0.033)	(0.032)
Covs basic	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes
Covs additional	No	Yes	No	No
Stratum FE	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No
Observations	3536	3536	3426	3536
Clusters	356	345	356	356

Standard errors clustered by polygon.

Notes: the dependent variable is a standardized index increasing in participation in townhall meetings and submission of suggestion cards. Column 1 shows the basic specification shown throughout the paper. Column 2 shows robustness check 1 (only the three basic covariates). Column 3 shows robustness check 2 (the full set of possible covariates). Column 4 shows robustness 3 (enumerator fixed effects). Robustness check 4 (sampling weights) is not relevant for AES coefficients.

Table 22: Multiple comparison adjustments for participation outcomes

	Townhall meeting attendance	Suggestion card submission
Program	0.044**	0.026**
	(0.020)	(0.012)
Covariates	Yes	Yes
Stratum FE	Yes	Yes
R^2	0.062	0.055
Observations	1934	2912
Clusters	252	356
Control Mean	.18	.1
Unadjusted p-value	.027	.034
Bonferroni Adjusted p-value	.042	.052

Standard errors clustered by polygon. $^{*}p < 0.1,^{**} p < 0.05,^{***} p < 0.01$.

Notes: *Townhall attendance* is an indicator variable that equals 1 if a participant attended a townhall meeting. *Suggestion card submission* is an indicator variable that equals 1 if a participant submitted his or her suggestion card. The Bonferroni-adjusted p-value is calculated following Sankoh et al. (1997) and Aker et al. (2011) including an adjustment for the fact that the dependent variables are correlated. Specifically, if m is the number of correlated outcome variables and ρ is the average correlation coefficient among the other outcome variables, the Bonferroni p-value with a correlation adjustment equals $1 - (1 - p)^g$, where $g = m^{(1-\rho)}$.

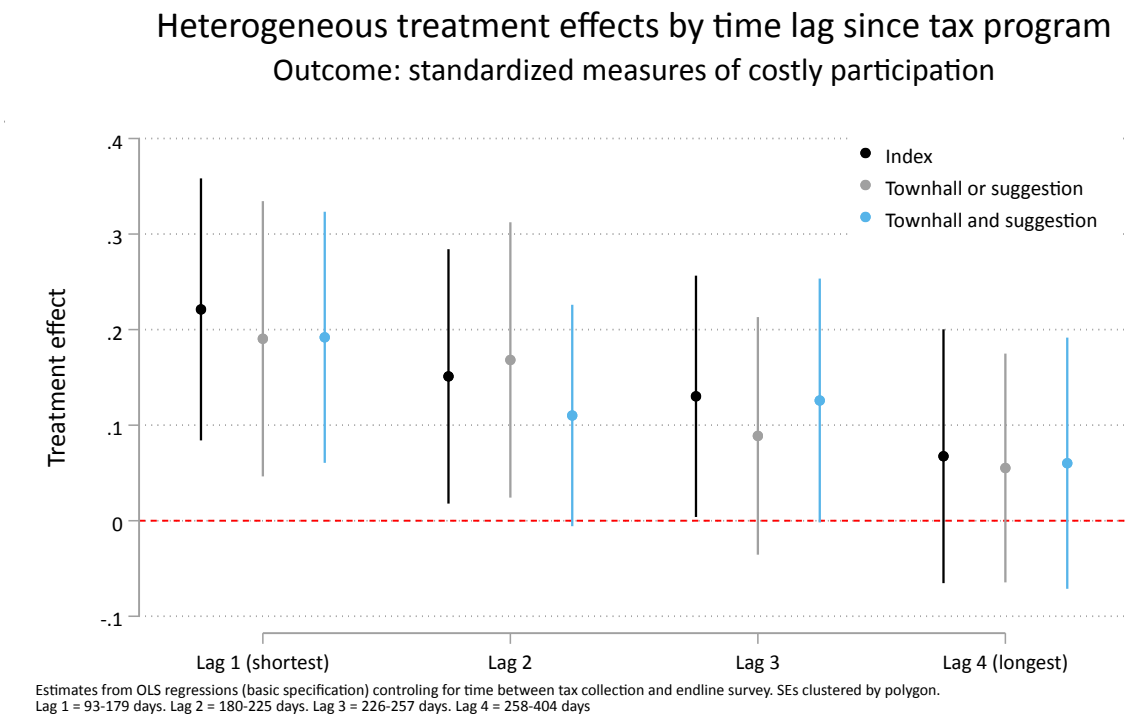

Figure 12: Heterogeneous treatment effects by time lag between tax collection and endline survey enumeration (controlling for time of endline survey enumeration).

Table 23: Perceived current level of public goods provision by the provincial government

	Schools	Water	Health	Security	Welfare	Develop.	Roads
Program	-0.022	0.024	-0.024	0.068	0.027	0.053	0.028
	(0.045)	(0.043)	(0.043)	(0.044)	(0.041)	(0.041)	(0.040)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stratum FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.025	0.034	0.050	0.038	0.034	0.031	0.055
Observations	2857	2892	2873	2878	2808	2821	2890
Clusters	356	356	356	356	356	356	356
ControlMean	0.004	-0.016	0.018	-0.032	-0.016	-0.034	-0.036

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$

Notes: The dependent variables reflect respondents' views about the current level of public goods provision by the provincial government in each of the sectors listed as column titles. (*Develop.* is short for economic development. The exact wording of the survey question is: "Now let's talk about what services the provincial government currently provides to the citizens of Kananga. In your opinion, what level of public services does the provincial government of Kasai Central *currently* provide?" Enumerators then listed each of the sectors that appear in the table heading. Responses included 'a lot', 'some', and 'nothing'.

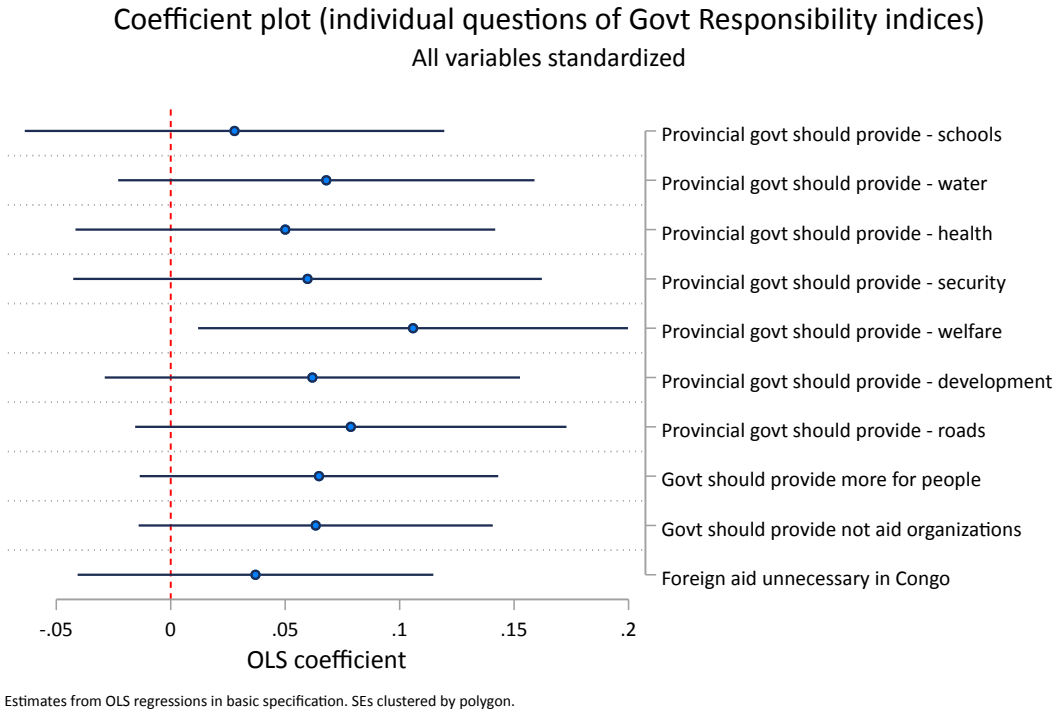

Figure 13: Coefficient plot for individual survey questions about the responsibility of the provincial government in the provision of public goods (sector and viewpoint questions).

3.3 Robustness checks for paper Section 8.3: Alternative explanations

Table 24: *Trusts researchers* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.066	0.051	0.063	0.069	0.006
	(0.057)	(0.055)	(0.044)	(0.059)	(0.071)
ProgXHouse					0.118
					(0.096)
House quality					-0.150*
					(0.081)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.034	0.055	0.131	0.037	0.039
Observations	2733	2644	2733	2733	2731
Clusters	356	345	356	356	356
ControlMean	3.092	3.092	3.092	3.092	3.092
Weights	No	No	No	Yes	No
Ftest					0.261

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is a standardized measure of respondents' self-reported trust levels in foreign research organizations. Enumerators read the following prompt: "I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all?"

Table 25: *Remembers researchers* robustness

	(1)	(2)	(3)	(4)	(5)
Program	-0.045	-0.061	-0.039	-0.040	-0.044
	(0.048)	(0.049)	(0.042)	(0.050)	(0.064)
ProgXHouse					0.024
					(0.080)
House quality					-0.040
					(0.067)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.097	0.181	0.165	0.125	0.122
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	0.034	0.034	0.034	0.034	0.034
Weights	No	No	No	Yes	No
Ftest					0.770

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is a standardized measure of respondents' ability to correctly identify the employer of the enumerator at the conclusion of the endline survey.

Table 26: *Participated in past* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.025	0.027	0.015	0.023	0.030
	(0.037)	(0.038)	(0.035)	(0.039)	(0.052)
ProgXHouse					-0.012
					(0.072)
House quality					-0.038
					(0.061)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.013	0.022	0.030	0.016	0.017
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	-0.014	-0.014	-0.014	-0.014	-0.014
Weights	No	No	No	Yes	No
Ftest					0.807

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is a standardized measure of respondents' self-reported participation in past research activities conducted by our team in Kananga.

Table 27: *Engagement with national politics* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.048	0.029	0.047	0.011	0.056
	(0.043)	(0.046)	(0.038)	(0.046)	(0.059)
ProgXHouse					-0.039
					(0.079)
House quality					0.063
					(0.067)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.066	0.086	0.100	0.072	0.068
Observations	2912	2813	2912	2912	2910
Clusters	356	345	356	356	356
ControlMean	-0.003	-0.003	-0.003	-0.003	-0.003
Weights	No	No	No	Yes	No
Ftest					0.620

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable is increasing in expected future national political participation. It is a standardized index of the following: (1) an indicator if the respondent voted in the 2011 election; (2) a variable increasing in the certainty of plans to vote in next election (on the scale "Planning on it (with certainty), strongly considering, considering, or not considering"); (3) a variable increasing in the certainty of plans to join a political party (if not a member already — individuals who are already members of parties are coded equally with "planning on it (with certainty)"); (4) an indicator if the respondent reports every participating in a national political march; (5) a variable increasing in the certainty of plans to participate in march in the future; (6) an indicator if the respondent has participated in a national political protest; (7) a variable increasing in the certainty of plans to participate in such a protest in the future; (8) an indicator if the respondent has participated in a national political rally; (9) a variable increasing in the certainty of plans to participate in a party rally in the future.

Table 28: *Engagement with local city chiefs* robustness

	(1)	(2)	(3)	(4)	(5)
Program	-0.058	-0.115**	-0.091**	-0.090*	-0.144**
	(0.047)	(0.045)	(0.043)	(0.048)	(0.062)
ProgXHouse					0.090
					(0.081)
House quality					-0.102
					(0.066)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.063	0.106	0.117	0.084	0.088
Observations	2825	2728	2825	2825	2823
Clusters	356	345	356	356	356
ControlMean	0.041	0.041	0.041	0.041	0.041
Weights	No	No	No	Yes	No
Ftest					0.055

Standard errors clustered by polygon. $^{*}p < 0.1$,** $p < 0.05$,*** $p < 0.01$.

Notes: the dependent variable is a standardized index increasing in the perceived (and revealed) legitimacy of local city chiefs. It is composed of measures of the familiarity of the avenue chief's name, indicators of visits to the commune, quartier, and avenue chiefs (respectively) to discuss community problems, indicators of having contributed in Salongo (local public good projects organized by city chiefs), trust levels of the avenue and quartier chief, and perceived responsiveness of avenue chief. Respondents who themselves report being local city chiefs are excluded from these regressions.

Table 29: *General interest in politics* robustness

	(1)	(2)	(3)	(4)	(5)
Program	-0.011	-0.029	-0.009	-0.018	-0.053
	(0.040)	(0.038)	(0.038)	(0.042)	(0.050)
ProgXHouse					0.096
					(0.073)
House quality					-0.024
					(0.065)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.150	0.207	0.195	0.175	0.168
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	0.039	0.039	0.039	0.039	0.039
Weights	No	No	No	Yes	No
Ftest					0.393

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is a standardized index increasing in revealed and self-reported interest in learning about the government and politics. The constituent questions include the following. (1) *Consumption of political news by radio*: a measure of how often the participant reports listening to the radio about politics. (2) *Consumption of political news by internet*: a measure of how often the participant reports reading articles on the internet about politics. (3) *Choose to learn budget of govt*: An indicator that equals 1 if the respondent preferred the first option when faced with the choice: "Information 1: The total budget of the provincial government in 2016. OR Information 2: The total budget of UNICEF in Kasai Central in 2016." (4) *Choose to learn number of govt employees*: An indicator that equals 1 if the respondent preferred the first option when faced with the choice: "Information 1: The percentage of the population that works for the state. OR Information 2: The percentage of the population who is Catholic, Protestant, and Pentecostal." (5) *Choose to learn extent of public lighting*: An indicator that equals 1 if the respondent preferred the first option when faced with the choice: "Information 1: The percentage of Kananga's public lighting that currently functions. OR Information 2: The percentage of Kananga's residents who own a diesel generator."

Table 30: *Preference for democracy* robustness

	(1)	(2)	(3)	(4)	(5)
Program	-0.009	-0.013	0.014	-0.009	0.005
	(0.041)	(0.041)	(0.036)	(0.043)	(0.059)
ProgXHouse					-0.005
					(0.082)
House quality					-0.100
					(0.070)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.056	0.073	0.095	0.067	0.062
Observations	2875	2779	2875	2875	2874
Clusters	356	345	356	356	356
ControlMean	-0.004	-0.004	-0.004	-0.004	-0.004
Weights	No	No	No	Yes	No
Ftest					0.996

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is increasing in the degree to which respondents envision a large and active role for citizens in politics. It is an index composed of the respondent's choice when faced with a series of competing viewpoints concerning the ideal degree of democratic accountability in government. (1) *Citizens should monitor*: The first tradeoff asked respondents their position with regard to the following viewpoints 'Some people say that citizens should have an active role in monitoring the actions of leaders and how the government spends its money' vs 'Other people say that citizens should have more respect for authority and trust the government to spend its money in the best possible way.' Respondents could choose between 'strongly agree,' 'agree,' 'neutral,' 'disagree,' and 'strongly disagree.' (2) *Citizens must have voice*: The second tradeoff asked respondents their position with regard to the following viewpoints 'It is more important for citizens to have a voice and some influence in politics, even if that means it makes decisions more slowly' vs 'it is more important to have a government that make decisions quickly, even if we the citizens have no influence over what it does.' (3) *Assembly should monitor*: The first tradeoff asked respondents their position with regard to the following viewpoints Agreement with 'The Provincial Assembly should ensure that the Governor explains to it on a regular basis how his government spends taxpayers' money' vs 'The Governor should be able to devote his full attention to developing the country rather than wasting time justifying his actions.'

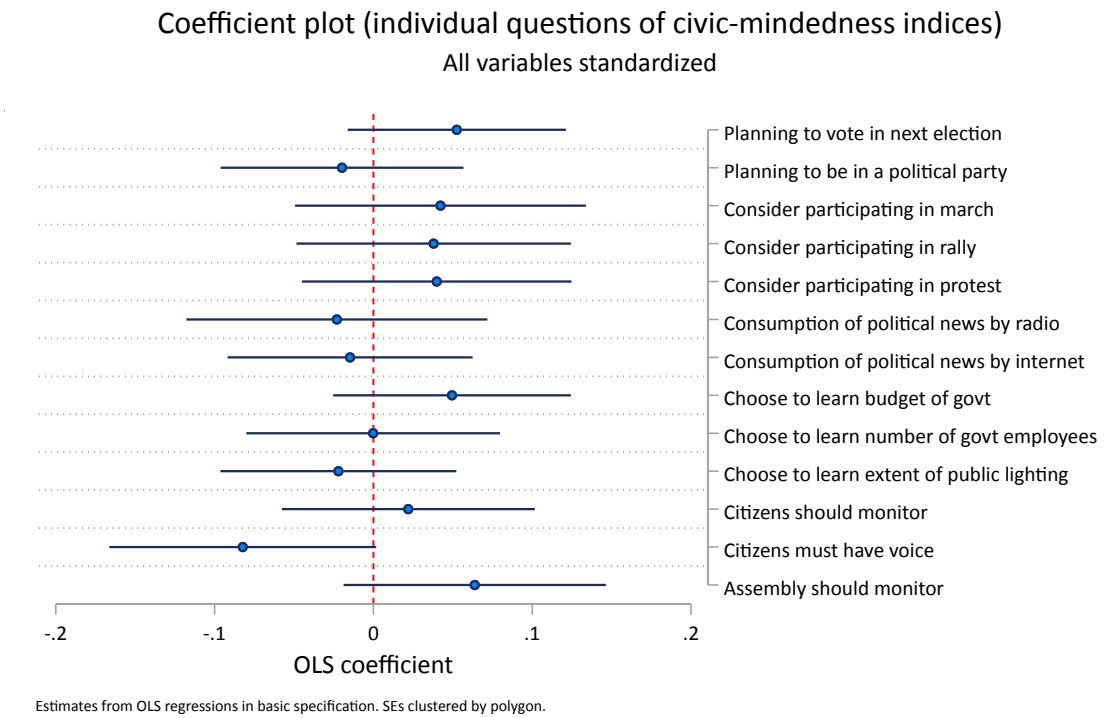

Figure 14: Coefficient plot for individual survey questions about expected future national political participation and interest in politics in general.

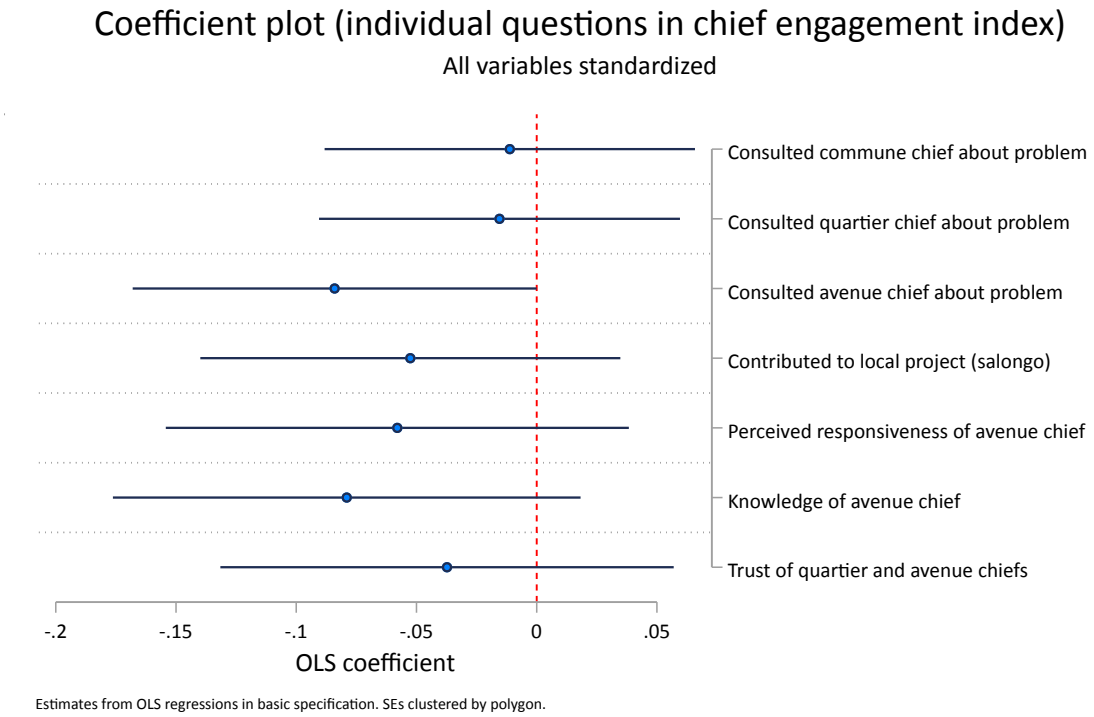

Figure 15: Coefficient plot for individual survey questions concerning engagement with city chiefs.

3.4 Robustness checks for paper Section 9.2: Taxation as a signal of government capacity

Table 31: *Capacity to extract taxes* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.038	0.025	0.033	0.043	0.041
	(0.049)	(0.047)	(0.038)	(0.050)	(0.064)
ProgXHouse					0.023
					(0.085)
House quality					-0.096
					(0.071)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.039	0.069	0.122	0.047	0.045
Observations	2883	2788	2883	2883	2881
Clusters	356	345	356	356	356
ControlMean	-0.017	-0.017	-0.017	-0.017	-0.017
Weights	No	No	No	Yes	No
Ftest					0.537

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable is an index increasing in perceived capacity to punish individuals who evade the property tax. It is constructed based on respondents' answers to the following questions. (1) Now, imagine that next week a tax collector comes and visits one of your neighbors. Imagine he absolutely refuses to pay. In this case, what is the probability that the government will pursue and enforce sanctions?(2) Now imagine your neighbor pays a bribe instead of paying the tax. What is the probability that the government will punish the person for paying a bribe? (Definitely, very likely, unlikely, very unlikely)

Table 32: *Capacity to provide public goods* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.002	0.022	-0.031	-0.002	0.002
	(0.054)	(0.054)	(0.041)	(0.055)	(0.070)
ProgXHouse					-0.029
					(0.091)
House quality					-0.053
					(0.074)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.025	0.070	0.135	0.036	0.038
Observations	2484	2402	2484	2484	2482
Clusters	326	316	326	326	326
ControlMean	0.009	0.009	0.009	0.009	0.009
Weights	No	No	No	Yes	No
Ftest					0.924

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is an index increasing in perceived capacity to provide public goods. It is constructed based on respondents' answers to the following questions. (1) If the provincial government of Kasai Central wants to improve all of the roads in Kananga, it will do this quickly and without problems. (2) If the provincial government of Kasai Central wants to provide electricity to everyone in Kananga, it will do this efficiently and without problems. (3) If the provincial government of Kasai Central wants to find and imprison a criminal hiding somewhere in Kananga, it will do this efficiently and without problems.

Table 33: *Awareness of tax ministry* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.460***	0.453***	0.438***	0.466***	0.552***
	(0.039)	(0.038)	(0.037)	(0.042)	(0.057)
ProgXHouse					-0.185**
					(0.077)
House quality					0.019
					(0.068)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.140	0.213	0.180	0.163	0.163
Observations	2913	2814	2913	2913	2911
Clusters	356	345	356	356	356
ControlMean	-0.266	-0.266	-0.266	-0.266	-0.266
Weights	No	No	No	Yes	No
Ftest					0.000

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable is an index increasing in respondents' familiarity with the property tax, campaign, and tax ministry in a quiz-style survey module. It is constructed based on respondents' answers to the following questions. Do you know the name of the provincial tax ministry in Kananga? If so, please say the name. (Enumerator chooses between: knows full name, knows part of the name, and doesn't know the name.) (2) Have you heard of the property tax? If so, please describe the tax. (Enumerator chooses between: knows who pays and amount, knows who pays but not amount, and doesn't know the tax.) (3) Have you heard of state agents circulating on the ground with tablets to collect property taxes since April of 2016? (Yes, no).

Table 34: *Honesty of government* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.197***	0.184***	0.138***	0.193***	0.223***
	(0.049)	(0.047)	(0.042)	(0.050)	(0.063)
ProgXHouse					-0.101
					(0.081)
House quality					-0.029
					(0.068)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.042	0.086	0.125	0.066	0.062
Observations	2777	2686	2777	2777	2775
Clusters	356	345	356	356	356
ControlMean	-0.106	-0.106	-0.106	-0.106	-0.106
Weights	No	No	No	Yes	No
Ftest					0.001

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable is an index increasing in the perceived amount of money collected in property taxes will actually be spent on public goods. It is constructed based on respondents' answers to the following questions. (1) In general, think of what the tax collectors will do with the money they collect during this 2016 property tax campaign. Imagine the tax collectors collect $1000 thanks to the campaign. How much of this money will they submit to the state account? How much will they keep for themselves? (2) Now I would like to ask you what you think the provincial government will do with the money it receives from this 2016 property tax campaign. Imagine that the provincial government of Kasai Central receives $1000 thanks to this campaign. How much of this money will be put to good use, for example providing public goods? How much will go to corruption and waste?

Table 35: *Legibility to the state* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.132***	0.153***	0.094**	0.131***	0.106*
	(0.045)	(0.043)	(0.038)	(0.046)	(0.059)
ProgXHouse					0.091
					(0.077)
House quality					-0.034
					(0.067)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.068	0.146	0.139	0.086	0.086
Observations	2910	2811	2910	2910	2908
Clusters	356	345	356	356	356
ControlMean	-0.080	-0.080	-0.080	-0.080	-0.080
Weights	No	No	No	Yes	No
Ftest					0.001

Standard errors clustered by polygon. $^{*}p < 0.1$,** $p < 0.05$,*** $p < 0.01$.

Notes: the dependent variable is an index increasing in the perceived information capacity of the government. It is constructed based on respondents' answers to the following questions. (1) Do you think the provincial government knows the address of your house? (2) Do you think the provincial government knows which of your neighbors did not pay the property tax in 2016? (3) Do you think the provincial government knows what you do for a living? (4) Do you think the provincial government knows how much money you make each month? Responses included: Yes - I am completely sure, Yes - I am somewhat sure, No - I am somewhat sure, No - I am completely sure.

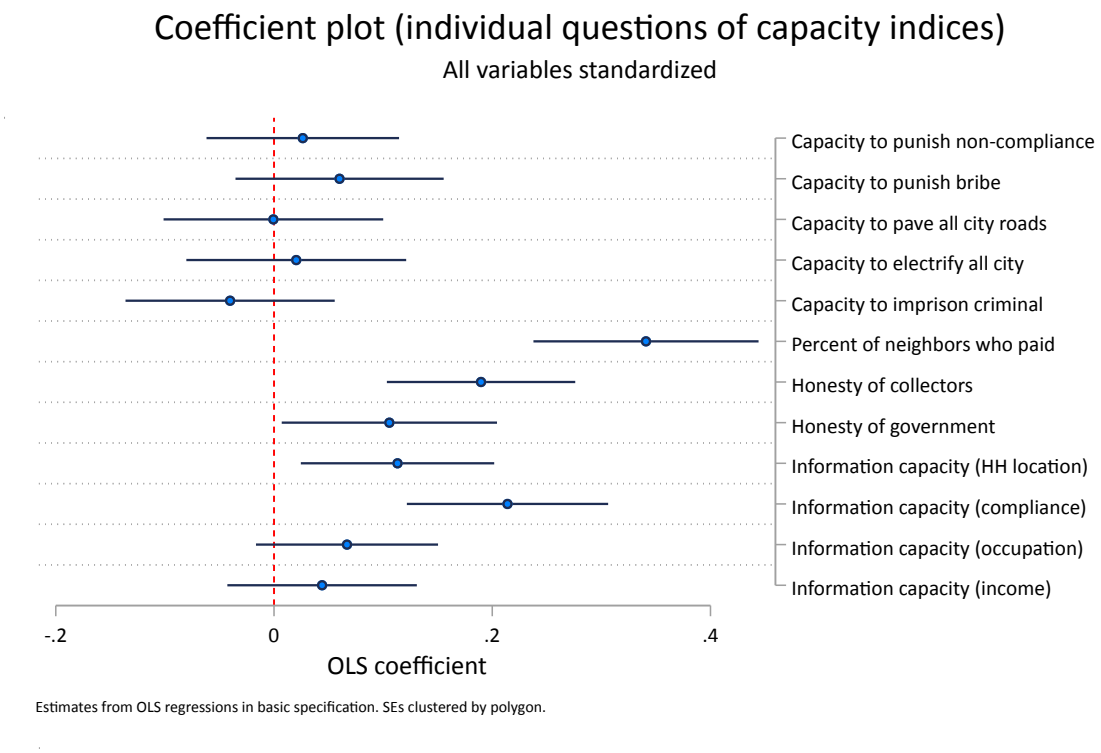

Figure 16: Coefficient plot for individual survey questions concerning the quality of the provincial government.

3.5 Robustness checks for paper Section 9.1: Payment-based mechanisms

As noted in the paper, in Martin's (2014) model, loss-averse citizens are tipped below their reference point of earned income by paying taxes, thereby fomenting grievances that magnify the expressive utility they get from voicing complaints about taxation and sanctioning low-quality politicians. Tax payers lose more utility than non-payers when the government does not spend their taxpayer dollars according to their preferences.

I test this by examining citizens' views of the provincial government and tax ministry. *Approve of government* is an index increasing in the extent to which respondents view the government favorably. It is constructed using a survey question on respondents' overall evaluation of the "performance of the provincial government," and a second question on trust in the government. *Approve of tax ministry* is an exactly analogous index increasing in views of the provincial tax ministry.

Table 36: Approval of the provincial government and tax ministry

	Approve of government			Approve of tax ministry		
	(1)	(2)	(3)	(4)	(5)	(6)
Program	0.039	-0.025		0.116**	0.095	
	(0.049)	(0.067)		(0.047)	(0.061)	
ProgXHouse		0.138			0.047	
		(0.090)			(0.085)	
Paid Tax			0.061			0.337***
			(0.081)			(0.070)
House quality		-0.099			-0.126*	
		(0.078)			(0.075)	
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Stratum FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.043	0.044	0.060	0.066	0.068	0.074
Observations	2795	2793	1608	2791	2789	1610
Clusters	356	356	211	356	356	211
Control Mean	-0.030	-0.030	-0.030	-0.076	-0.076	-0.076
F-test (p)		0.207			0.039	

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: *Approve of government* is an index increasing in views of the government. It is constructed using the self-reported evaluation of the "performance of the provincial government" and trust of the government. *Approve of tax ministry* is an analogous index increasing in views of the provincial tax ministry. In columns 3 and 6, the sample is restricted to treated polygons only.

Table 36 summarizes OLS regressions using these as the dependent variable. The tax collection program does not, on average, depress individuals views of the provincial government (Columns 1-2). In fact, it boosts perceptions of the tax ministry (Columns 4-5). This result aligns with the reduction in perceived corruption due to the tax campaign (Paper Table 13); it also reinforces the idea that the campaign sent a signal of government capacity due to its novelty in this setting. Moreover, payers are not more disapproving of the government compared to non-payers in treated

polygons (Column 3). They also evaluate the tax ministry more positively (Column 6), suggesting the importance of "tax morale" as a determinant of compliance in this setting (Luttmer and Singhal, 2014).[12] For completeness, Table 37 summarizes results of analogous IV regressions — following the strategy discussed in Paper Section 9.1 — which also suggest that tax payment does not depress views of the government or tax ministry in this setting.

Table 37: IV - Second Stage: Effects of payment on government approval

	Approve of government		Approve of ministry	
	(1)	(2)	(3)	(4)
Paid	0.651	0.135	1.054	1.090
	(0.919)	(0.991)	(0.954)	(1.054)
Visited	-0.032	0.119	0.033	0.096
	(0.160)	(0.164)	(0.161)	(0.174)
Covariates	Yes	Yes	Yes	Yes
Stratum FE	Yes	Yes	Yes	Yes
AP F-stat (Paid)	12	8.1	12	8
AP F-stat (Visited)	154	93	152	92
Instruments	Basic	JIVE	Basic	JIVE

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$

Notes: *Approve of government* is an index increasing in views of the government. It is constructed using the self-reported evaluation of the "performance of the provincial government" and trust of the government. *Approve of tax ministry* is an analogous index increasing in views of the provincial tax ministry. In columns 3 and 6, the sample is restricted to treated polygons only.

The next two tables are the standard robustness checks and coefficient plot for these regressions concerning the expressive utility mechanism.

[12] See Weigel (2017) for detailed analysis of tax compliance in this setting.

Table 38: *Approve of government* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.066	0.050	-0.001	0.058	-0.025
	(0.051)	(0.049)	(0.040)	(0.052)	(0.067)
ProgXHouse					0.138
					(0.090)
House quality					-0.099
					(0.078)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.025	0.071	0.109	0.044	0.044
Observations	2795	2700	2795	2795	2793
Clusters	356	345	356	356	356
ControlMean	-0.030	-0.030	-0.030	-0.030	-0.030
Weights	No	No	No	Yes	No
Ftest					0.207

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is an index increasing in views of the government. It is constructed based on respondents' answers to the following questions. (1) Overall, how would you rate the performance of the provincial government in Kananga? (Excellent, Very good, Good, Fair, Poor, Very poor, Terrible) (2) I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all? The Provincial Government of Kasaï Central.

Table 39: *Approve of tax ministry* robustness

	(1)	(2)	(3)	(4)	(5)
Program	0.148***	0.124**	0.070*	0.129***	0.095
	(0.049)	(0.048)	(0.042)	(0.048)	(0.061)
ProgXHouse					0.047
					(0.085)
House quality					-0.126*
					(0.075)
Covs basic	Yes	Yes	Yes	Yes	Yes
Covs imbalance	No	Yes	Yes	Yes	Yes
Covs additional	No	Yes	No	No	No
Stratum FE	Yes	Yes	Yes	Yes	Yes
Enum FE	No	No	Yes	No	No
R^2	0.044	0.087	0.121	0.069	0.068
Observations	2791	2696	2791	2791	2789
Clusters	356	345	356	356	356
ControlMean	-0.076	-0.076	-0.076	-0.076	-0.076
Weights	No	No	No	Yes	No
Ftest					0.039

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is an index increasing in views of the tax ministry. It is constructed based on respondents' answers to the following questions. (2) Overall, how would you rate the performance of the tax ministry in Kananga? (Excellent, Very good, Good, Fair, Poor, Very poor, Terrible) (2) I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all? The Provincial Tax Ministry (DGRKOC).

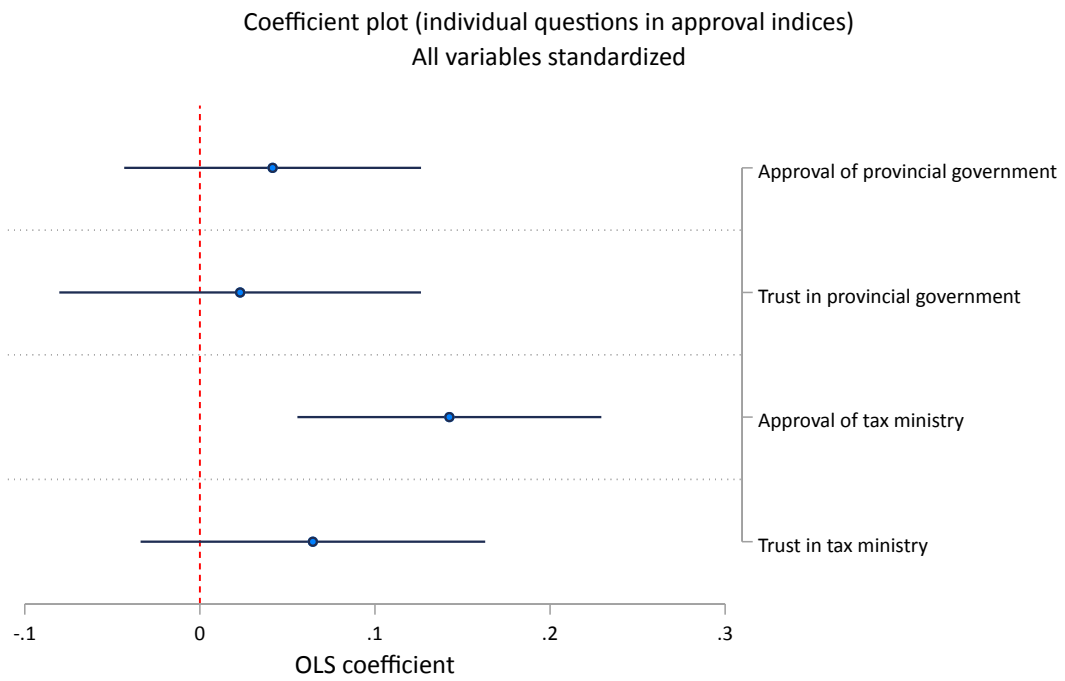

Figure 17: Coefficient plot for individual survey questions concerning approval of provincial government and tax ministry.

4 Collective action mechanisms

This section tests the plausibility of a collective action mechanism, in which the tax campaign boosts participation by stimulating communication and lowering the costs of coordination.

Figure 18 shows the intensity of participation by neighborhood, and Figure 19 shows participators' household locations within polygons. There are no obvious patterns that suggest enhanced collective action in treatment neighborhoods — such as participant households being more clustered geographically, for example.

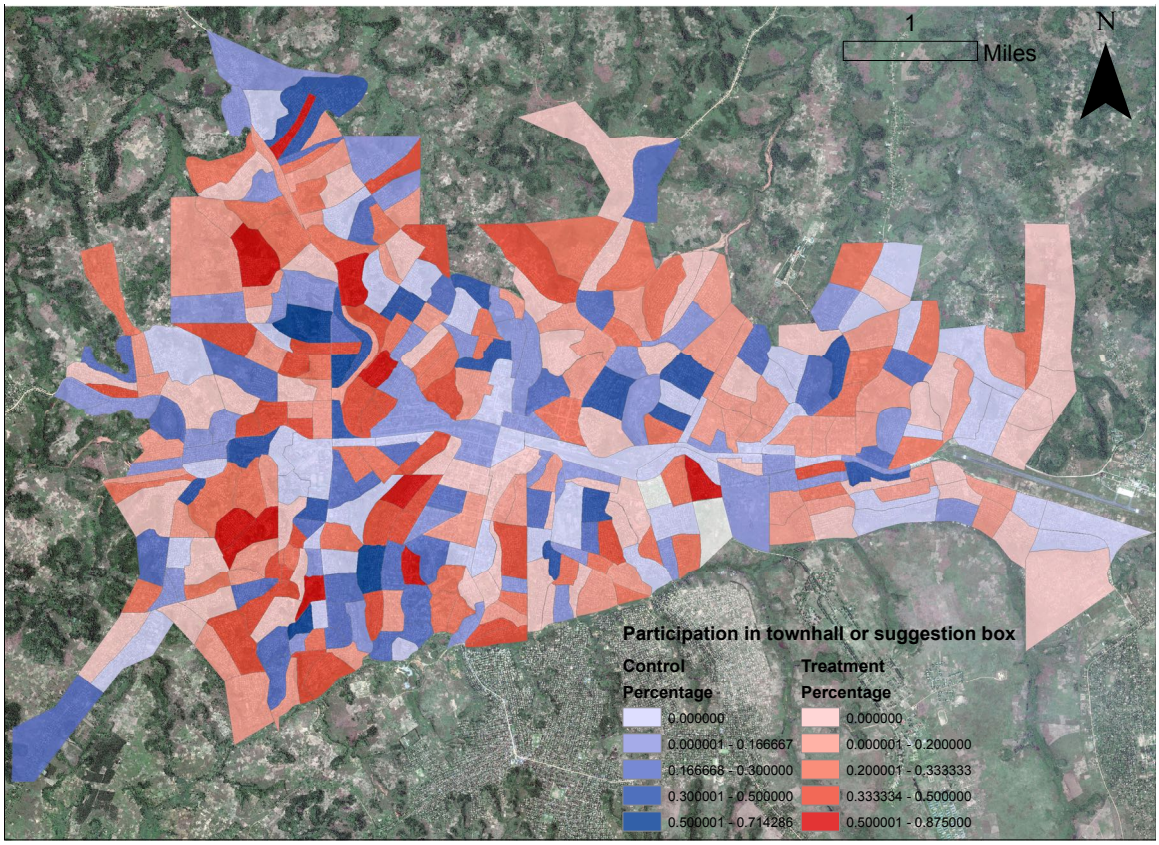

Figure 18: Neighborhood-level participation rates (in either the townhall meeting or suggestion box submission) across Kananga.

This section considers several more formal tests of a collective-action mechanism: (1) examining if treated townhall participants are more likely to show up to the meetings with other members of the neighborhood compared to control participants; (2) examining if individuals who participate in the townhall or the suggestion card exercise are more clustered geographically within treatment polygons relative to control polygons; (3) examining if the program had larger effects in areas with higher collective action potential; and (4) examining if the program appears to have stimulated the diffusion of rumors about the campaign, and whether neighborhoods with higher rates of rumor transmission exhibit larger treatment effects. Ultimately, although there is some suggestive evidence that the tax campaign could have stimulated coordination among citizens, it appears unlikely that a collective-action mechanism is driving the reduced-form effect on costly participation.

The first test is whether individuals in treatment polygons appear more likely to travel together to

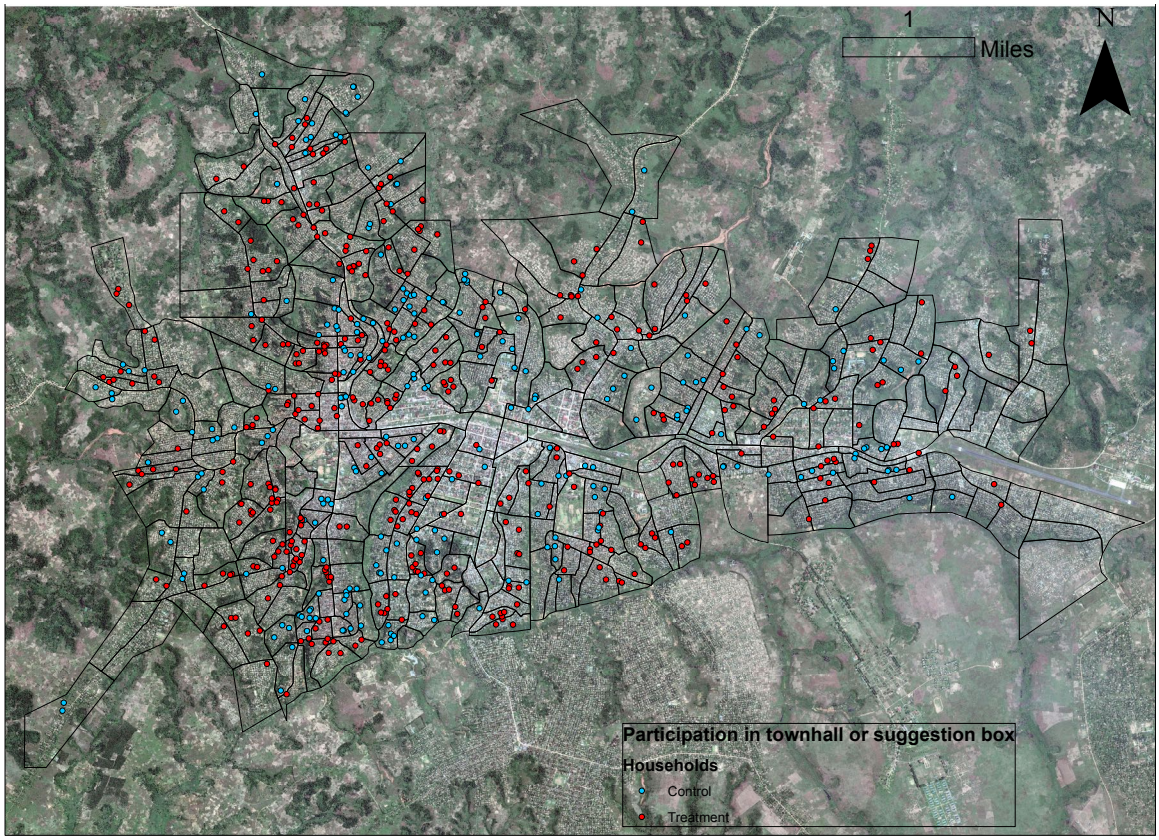

Figure 19: Locations of treatment and control individuals' households who either attended a townhall meeting or submitted a suggestion card across Kananga.

townhall meetings. If lower barriers to coordination explains the treatment effect, then one might expect individuals to share a motorbike taxi or walk together to the townhall meeting venue. Then would then arrive together and appear consecutively in data from the participant registration process.[13] Table 40 shows suggestive evidence that treated townhall participants are about 6 percentage points more likely to show up with other members of their neighborhood relative to control townhall participants. Column 2 includes a ("bad") control for the total attendance rate in a polygon to explore the possibility that the effect of the program on joint arrival is mechanically explained by the higher numbers of individuals attending meetings in treatment polygons. Although the total polygon attendance rate is also an outcome, and therefore technically a "bad control" (Angrist and Pischke, 2008), it is nonetheless suggestive that adding this regressor on the right-hand side does not change the estimated effect of the program. Column 3 then controls for the average population density of the polygon to make sure the effect is not driven by imbalance in how thickly settled neighborhoods are across treatment and control.[14] Although the estimate is only marginally significant in Column 2, the coefficient is stable, providing suggestive evidence that the tax program could have a catalytic effect on the degree of coordination among townhall participants.

The second test is whether treated participants' households appear more clustered geographically

[13]Enumerators completed a very short survey form to check participants' identity using the code written on their paper invitation. This survey included a timestamp, so it is possible to see if participants arrived together to the townhall meeting.

[14]Population density is calculated by dividing the estimated number of households by the total area of the polygon.

Table 40: Arriving at townhall with member of neighborhood

	Arrived at townhall meeting with neighbor		
	(1)	(2)	(3)
Program	0.063	0.065*	0.061
	(0.039)	(0.038)	(0.038)
Polygon townhall attendance		0.291**	0.263**
		(0.122)	(0.121)
Polygon population density			-0.072*
			(0.039)
Covariates	Yes	Yes	Yes
Stratum FE	Yes	Yes	Yes
R^2	0.109	0.122	0.131
Observations	480	480	479
Clusters	206	206	205
Control Mean	.067	.067	.067

Standard errors clustered by polygon. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Notes: the dependent variable is an indicator for townhall participants who arrived with another individual from the same polygon. *Polygon townhall attendance* is the average rate of townhall attendance in the polygon. *Polygon population density* is the estimated total number of houses divided by the area of the polygon. The sample includes all individuals who attended a townhall meeting.

within polygons compared to control participants. If individuals are making isolated, independent decisions about whether or not to engage in costly participation, then their households ought to be spread out throughout the polygon, as demonstrated by the first panel of Figure 20. However, if a collective-action mechanism explains the increase in participation caused by the tax campaign, then we might expand individuals in the vicinity to be more likely to attend as well, such as those that fall within the red circle in the second panel. The third panel indicates a spatial distribution of participator households that would lend credence to a collective action mechanism relative to the stylized distribution in the first panel representing a control neighborhood.

An observable implication of this hypothesized difference in spatial distribution of participators is that the average distance among the households of participators within polygons should be *smaller* in treatment relative to control, conditional on the total number of participators per polygon. To construct this measure, I first calculate the euclidean distance between each participant's household within a polygon and then take the average of these distances.[15] As shown in Table 41, although the point estimate on the program indicator is negative, it is not statistically distinguishable from zero. This observation remains true if we condition on the polygon participation level — the number of households participating may mechanically decrease the average distance outcome[16] — and the average population density of the polygon. This exercise, therefore, does not provide support for a collective-action mechanism.

The third test is to examine whether neighborhoods more conducive to collective action exhibit a

[15]The analysis is thus on the polygon level, omitting polygons with fewer than two participants.

[16]This is, again, a "bad control" and included for completeness.

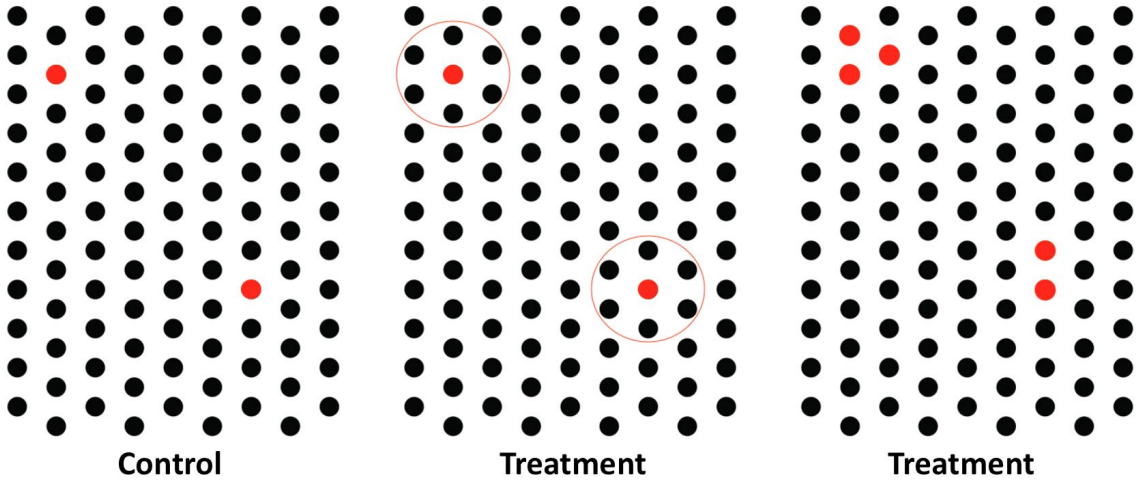

Figure 20: Stylized illustration of hypothetical participants in treatment and control.

larger treatment effect. That is, if a collective-action mechanism were chiefly behind the increase in participation, one might expect that the treatment effect would be larger in neighborhoods in which barriers to collective action were lower ex ante. I consider four proxies for the "collective action potential" of different neighborhoods in Kananga. The first, *Baseline protest*, is the average rate of participation in political protests observed at baseline. Because taking part in protests also necessitates overcoming the collective-action problem, the baseline rate of participation in protests can be thought of as a form of revealed collective action capacity of neighborhoods before the tax campaign. The second proxy, *Baseline ethnic homogeneity*, is the ethnic homogeneity of the neighborhood. Numerous studies have documented the challenges to collective action in settings of high ethnic heterogeneity (Easterly and Levine, 1997; Miguel and Gugerty, 2005; Larson and Lewis, 2017). I therefore estimate the ethnic homogeneity of neighborhoods using baseline data on self-reported ethnicity. Third, the population density of a neighborhood is another plausible correlate of collective-action potential. More densely populated networks are characterized by higher rates of information diffusion, which might facilitate coordination (Granovetter, 1973). Finally, a common way political parties solve collective-action problems in politics is the activity of local brokers who coordinate among individual voters. Individuals known as "avenue chiefs" and "quarter chiefs" play this role in Kananga, though they are not powerful as in some more consolidated African democracies with stronger parties. The observed activity of avenue chiefs at baseline, *Baseline chief activity*, therefore offers yet another proxy for the collective-action potential of neighborhoods.[17]

Table 42 explores heterogeneous treatment effects according to each of these measures. To facilitate interpretation, I use binary versions of each measure, where each variable indicates that a polygon is above the median in the sample. Confirming the intuition noted in the previous paragraph, each variable enters with a positive (though statistically insignificant) coefficient, indicating that these neighborhood characteristics may indeed facilitation participation on the margin. The regressions summarized in this table reveal that, in fact, the treatment effect is considerably *larger* in neighborhoods with below-median rates of baseline participation in protests, ethnic homogeneity, population density, and chief activity. In other words, precisely where collective action was

[17]Specifically, baseline survey participants responded whether one of these chiefs had ever collected formal or informal taxes from them in the past. This information is used to gauge how active chiefs were ex ante.

Table 41: Average euclidean distance among participators' households

	Average distance among participating households		
	(1)	(2)	(3)
Program	-1.667	-2.189	-2.262
	(2.636)	(2.575)	(2.552)
Polygon participation level		20.313***	19.630***
		(7.462)	(7.452)
Polygon population density			-2.068
			(2.198)
Stratum FE	Yes	Yes	Yes
R^2	0.225	0.239	0.242
Observations	196	196	196
ControlMean	14	14	14

Robust standard errors. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: The dependent variable is the polygon-level average euclidean distance (measured in degrees) among the households of all individuals who either attended a townhall meeting or submitted a suggestion card. *Polygon townhall attendance* is the average rate of townhall attendance in the polygon. *Polygon population density* is the estimated total number of houses divided by the area of the polygon. The unit is the polygon. The sample includes all polygons with multiple individuals who either attended the townhall or submitted a suggestion card.

difficult ex ante, the program appears to have caused a larger boost in costly participation.

Figure 21 summarizes this finding graphically. It shows stratum-level participation rates for treatment polygons and control polygons, sorted by the observed level of participation in control neighborhoods within a stratum.[18] The graph highlights that in strata where participation is already high, there is less evidence of a consistent treatment effect. The average effect noted in the main results section derives chiefly from parts of the city with low levels of participation absent the program.

The most natural interpretation of these findings is that the collective-action mechanism is unlikely to be driving the reduced-form effect of the tax campaign on participation. Rather, this pattern of heterogeneous effects is consistent with the suggestion, noted above, that the treatment has larger effects on individuals with less prior exposure to the formal state.[19] For these individuals, the informational signal sent by the tax collection program is stronger than it is for individuals who are habituated to interacting with the provincial government directly. Individuals with less past exposure to the state should thus update more about the capacity of the government because of the tax program, making it more likely that they will be tipped past the participation threshold and choose to attend the townhall meeting or submit a suggestion card. In other words, this evidence supports the signaling hypothesis noted in the previous section.

That said, an alternative interpretation of Table 42 is that the tax campaign has an average effect

[18] As noted, strata are defined based on location in the city and total population size.

[19] In particular, these results correspond with the heterogeneous effects by house quality (a dichotomous proxy for wealth) noted previously: the program has a larger effect on relatively poorer parts of the population.

Table 42: Heterogeneity by baseline polygon-level collection action

	Participation in townhall or suggestion card			
	(1)	(2)	(3)	(4)
Program	0.068**	0.056***	0.056***	0.058**
	(0.031)	(0.020)	(0.022)	(0.023)
Prog X High party membership	-0.028			
	(0.036)			
High party membership	0.015			
	(0.025)			
Prog X High ethnic homogeneity		-0.013		
		(0.035)		
High ethnic homogeneity		0.042*		
		(0.024)		
Prog X High population density			-0.013	
			(0.033)	
High population density			0.029	
			(0.025)	
Prog X High chief activity				-0.021
				(0.033)
High chief activity				0.024
				(0.025)
Covariates	Yes	Yes	Yes	Yes
Stratum FE	Yes	Yes	Yes	Yes
R^2	0.067	0.068	0.067	0.067
Observations	2913	2913	2913	2913
Clusters	356	356	356	356
Control Mean	.18	.18	.18	.18
F-test p-value	.14	.16	.17	.13

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes:

on participation precisely because it catalyzes coordination in neighborhoods that have a deficit of collective action ex ante. The effect is more muted where collective action is already high because the additional boost to coordination is unnecessary: people are already participating. In this reading, then, the campaign fills a collective action deficit in certain areas.

A fourth test of the collective-action mechanism investigates rumors about the tax campaign. The clearest way in which tax collection could lower the barriers to collective action is by stimulating communication about the provincial government in local neighborhoods. If this were the key mechanism, one might expect a positive treatment effect on the circulation of rumors about the tax program on average, and a more pronounced effect on participation in neighborhoods with higher rates of rumor transmission.

I explore these possibilities using data gathered during the monitoring survey.[20] Individuals were

[20] As a reminder, this survey was administered concurrently with the tax collection campaign. In treatment neighborhoods, enumerators visited households for the monitoring survey 2-5 weeks after tax collectors finished

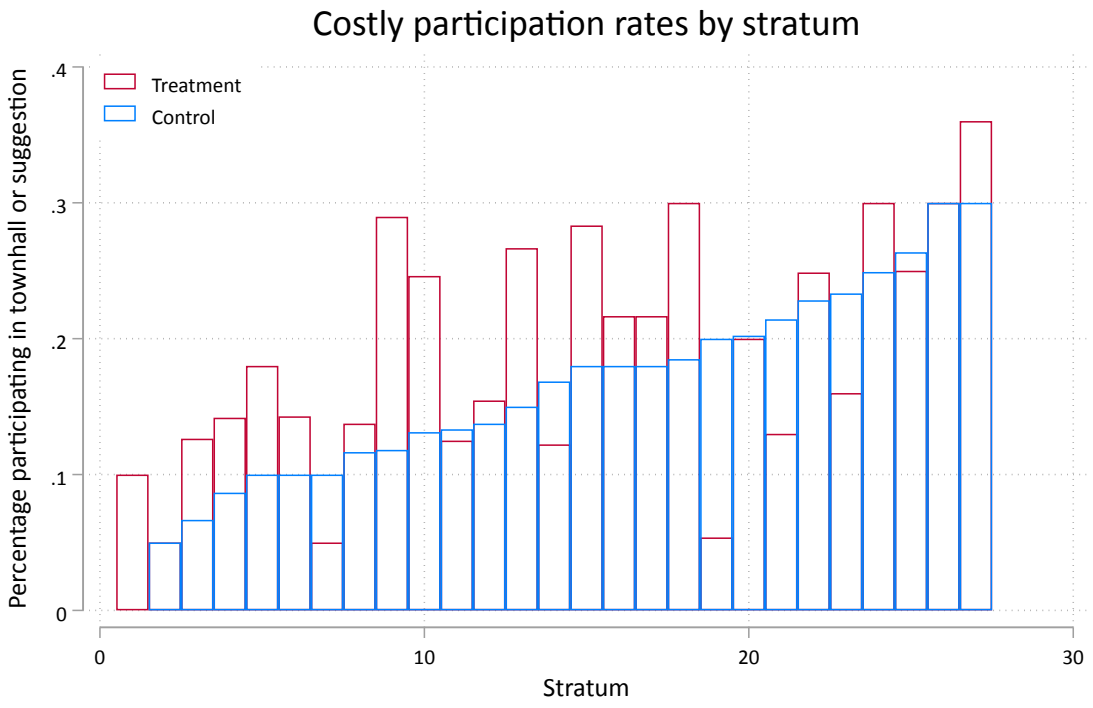

Figure 21: Costly participation within strata compared across treatment and control.

asked if they had heard of the property tax campaign from neighbors, the radio, etc, *before* the start of the survey and before the arrival of tax collectors (if they had reported a visit from collectors).[21] The question therefore gauges the extent of uncontrolled information flow about the tax campaign throughout the city: the spread of rumors about the campaign not directly associated with randomly assigned tax collector visits or the evaluation surveys administered by the research team. Nearly 30% of individuals in both treatment and control neighborhoods answered the question positively, indicating pre-treatment knowledge of the tax campaign. The most common ways in which individuals learned about the campaign were (1) the informational flier distributed in all neighborhoods before the campaign (discussed previously), (2) other people in the compound, such as family members or renters, and (3) neighbors (see Figure 22).

Were individuals in treatment neighborhoods more likely to hear rumors about the tax campaign? I consider two dependent variables. First, *Heard rumor of campaign* is an indicator for respondents with prior information about the tax campaign from *any* source. Second, *Heard neighborhood rumor* is an indicator for respondents who obtained prior information about the campaign from other people in their local neighborhood: members of their compound, neighbors or other individuals in the locality or quartier, or the local neighborhood chief. About 43.5% of individuals who had some prior knowledge of the tax campaign heard such neighborhood rumors. Table 43 provides suggestive evidence that rumors about the campaign were somewhat more widespread in treatment neighborhoods compared to control neighborhoods, though the point estimate is only marginally significant when considering the second dependent variable. It might seem surprising

working there. In control neighborhoods, enumerators visited 2-5 weeks after tax collectors finished work in an adjacent or nearby neighborhood.

[21] I added the questions about rumors midway through monitoring survey enumeration, so these data exist only for 47.7% of the full monitoring sample.

Table 43: Effects of the campaign on rumors

	Heard rumor of campaign	Heard neighborhood rumor
	(1)	(2)
Program	0.043	0.048*
	(0.036)	(0.028)
Stratum FE	Yes	Yes
R^2	0.125	0.095
Observations	36283	37067
Clusters	249	249
Control Mean	.29	.12

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: *Heard rumor of campaign* is an indicator for respondents who received information about the tax campaign before the monitoring survey and before tax collectors arrived at the household. *Heard neighborhood rumor* is a more restrictive version of the previous indicator variable that captures only local information diffusion about the tax campaign. Specifically, it equals 1 only for individuals who reported hearing of the tax campaign from (1) members of the compound, (2) neighbors, (3) people in the locality, (4) people in the quartier, or (5) the city chief. Data are from the monitoring survey, hence the larger sample size.

that the treatment is not strongly associated with greater communication about the tax campaign. However, recall that the pre-treatment information intervention (administered before this survey question) was distributed in *all* polygons — treatment and control — precisely to regularize and hold constant the spread of information about the tax campaign. Thus, the lack of a strong increase in rumors about the campaign is perhaps to be expected, especially since the informational fliers were the most common source of pre-treatment information about the tax campaign.

A more direct test of whether a collective-action mechanism underlies the reduced-form increase in participation due to the tax program is to examine whether neighborhoods characterized by higher diffusion of rumors about the campaign exhibit a larger treatment effect. Such an analysis is not identified, given that it essentially examines heterogeneous treatment effects by another outcome of the program (rumors). Nonetheless it can be suggestive if we assume that the treatment effect would be larger in neighborhoods with higher levels of rumor circulation.

I therefore calculate the polygon-level rate of rumor transmission during the monitoring survey, and construct an indicator variable, *High rumor rate*, if a polygon is above the median rate of rumor transmission. I also consider only rumors that spread through local channels, following the same coding rules as noted above for the *Heard neighborhood rumor* variable. Polygons with above-median rates of neighborhood-specific rumor transmission are indicated by the variable *High neighborhood rumor rate*. If higher levels of communication about the tax campaign explain the main treatment effect observed in the previous sections, then one would expect the program to have a more pronounced effect in neighborhoods with higher rumor diffusion.

However, as noted in Table 44, there is no evidence of heterogeneous treatment effects by rumor rates. Although the point estimate on the interaction term is positive, it is not statistically different from zero. Moreover, the magnitude of the average effect of the program on participation is unchanged, though the standard errors are larger because the sample is nearly halved for this

Table 44: Heterogeneity based on spread of rumors

	Townhall or suggestion	
	(1)	(2)
Program	0.046	0.046
	(0.029)	(0.030)
Prog X High rumor rate	0.024	
	(0.040)	
High rumor rate	-0.025	
	(0.034)	
Prog X High neighborhood rumor rate		0.020
		(0.039)
High neighborhood rumor rate		-0.032
		(0.034)
Covariates	Yes	Yes
Stratum FE	Yes	Yes
R^2	0.077	0.078
Observations	1719	1719
Clusters	208	208
Control Mean	.18	.18

Standard errors clustered by polygon. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Notes: the dependent variable is an indicator for participants who attended a townhall meeting or submitted a suggestion card. *High rumor rate* is an indicator for polygons above the median rate of rumor transmission during the monitoring survey. *High neighborhood rumor rate* is an indicator for polygons above the median rate of neighborhood-specific rumor transmission, i.e. rumors spread among family members, neighbors, members of the locality or quartier, or by the local city chief. The sample is smaller because rumor data exist only for 208 of 356 total polygons due to the addition of this module midway through survey enumeration.

analysis.[22]

In interpreting this null result, it is important to note that this survey question measuring rumors about the tax campaign does not necessarily capture information flow concerning engagement with the government, specifically attendance of a townhall meeting or submission of suggestion cards. However, it is a reasonable proxy: where individuals were better informed by the local "radio trottoir" (rumor mill) about the tax campaign, they are likely to also be in better contact about these avenues of political participation.

In conclusion, there is some suggestive evidence that the tax campaign could be a catalyst of collective action. Townhall meeting participants are slightly more likely to arrive with other members of their neighborhood (Table 40). The tax campaign also appears to have stimulated the spread of local tax-related rumors (Table 43), though the program does not have a more pronounced effect on participation in neighborhoods with higher rumor diffusion. However, both sources of evidence are only marginally statistically significant. The rest of the evidence considered

[22] As noted above, the reduction of sample size reflects the fact that the rumor questions were only administered midway through the monitoring survey. So I do not have these data for every polygon. This test concerns only 208 of the 356 polygons in the main analysis.

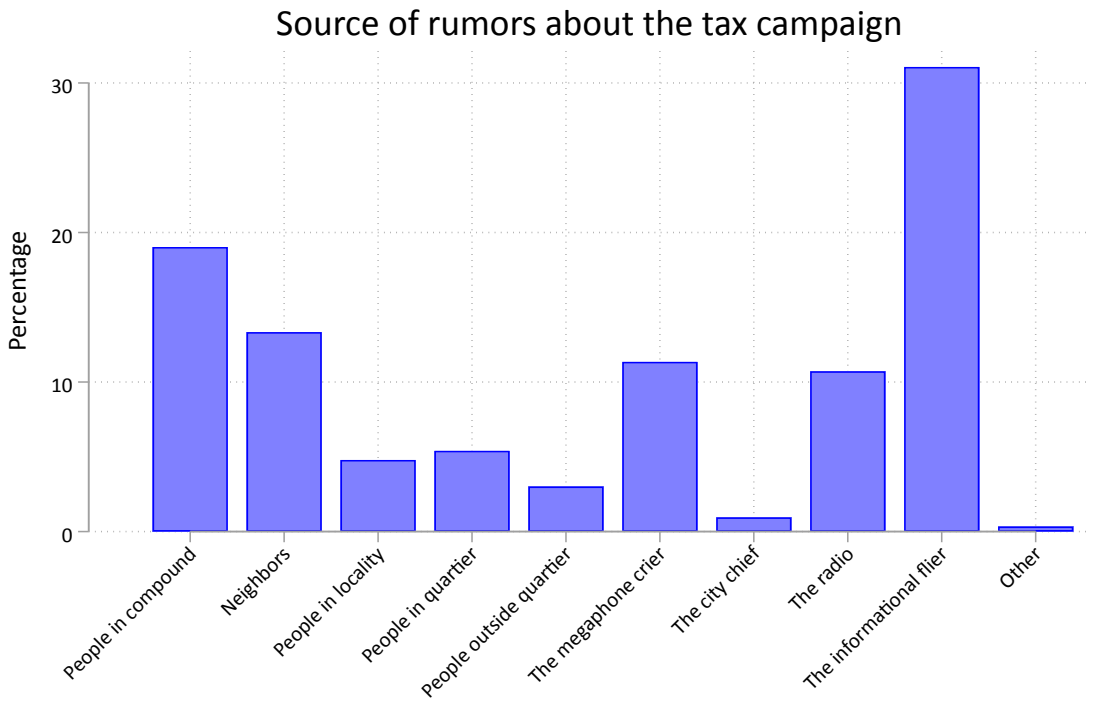

Figure 22: Where did you hear about the tax campaign for the first time?

does not provide support a collective-action mechanism. In sum, then, although a collective-action mechanism may explain part of the reduced-form increase in participation caused by the tax program, it is unlikely that it is the principal mechanism. There is stronger evidence in support of a signaling mechanism.

5 Data anomalies and violations of the experimental design

This section reports on anomalies that occurred over the course of the experiment.

5.1 Dealing with missingness in house quality data

Due to a survey programming glitch, there is missing data on house quality for 78 observations (1.9%) in the endline data. Fortunately, we do observe several components of the ultimate measure of wealth that is used in the analysis (floor quality, possessions, electricity access), as well as several other strong predictors (weekly and monthly income, amount of money spent on transport in past 7 days, amount of money spent on airtime in past 7 days). It is therefore possible to impute wealth measures following the following steps.

1. Within a neighborhood of three adjacent polygons, fit an OLS model with wealth as the dependent variable and all relevant independent variables (mentioned above) using all complete data.
2. Extract the coefficients and multiply them with the observed characteristics of the households for which we are missing wealth data.
3. Substitute the predicted value of wealth in cases in which it is missing.

In the main analysis, the full sample is used, including these imputed values for the wealth variable. However, the results are robust to simply dropping these observations in estimations that use the wealth variable.

5.2 Violations of randomization of tax program

One tax collector conducted one day of the census in a control polygon (polygon 421) instead of a different treatment polygon in the same area. He also collected taxes from two households. This polygon was located in Nganza commune, which I had to drop for the endline survey due to the conflict in Kananga. As such, this mistake does not affect the analysis considered in the paper.

5.3 Violations of random assignment of tax collectors

Although I randomly assigned tax collectors to polygons in groups of three, at times no tax collectors were able to work on the program. In such cases, I non-randomly re-assigned available collector to these polygons. The current analysis does not exploit the random assignment of collectors except in the jackknife IV strategy. But fortunately this is a not a central theme in the paper. These re-assignments will be of greater concern in future papers investigating how tax collector characteristics affect productivity and performance in the field. Below is a list of such cases:

1. Collector 1 re-assigned to polygon 111.
2. Collector 18 re-assigned to polygon 579, 212, 558.

3. Collector 31 re-assigned to polygons 368, 639.
4. Collector 7 re-assigned to polygon 419.
5. Collector 15 re-assigned to polygon 703.
6. Collector 37 re-assigned to polygon 676.
7. Collector 17 re-assigned to polygons 539, 675.
8. Collector 19 re-assigned to polygon 668.
9. Collector 22 re-assigned to polygon 671.
10. Collector 4 re-assigned to polygon 242.

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