Centralized vs. Local Taxation: Experimental Evidence from the DRC

Pablo Balán* Augustin Bergeron†
Gabriel Tourek‡ Jonathan Weigel§

June 8, 2019

Very Preliminary Draft — Please do not cite or circulate

Abstract

Historical states with low capacity often farmed out tax collection to local elites. Does local tax collection generate higher citizen compliance in fragile states today? We provide evidence from a field experiment in Kananga, D.R. Congo. In collaboration with the provincial government, we randomly assigned city neighborhoods to centralized tax collection, conducted by agents of the provincial tax ministry, or local tax collection, conducted by neighborhood chiefs. Local collection generates 36% greater compliance with the property tax. Hybrid treatment arms and survey evidence suggest that local chiefs generate higher revenue than central collectors because (i) they have better information about potential taxpayers, and (ii) they can better stimulate tax morale.[1]

*Department of Government, Harvard University. Email: pbalan@g.harvard.edu.
†Department of Economics, Harvard University. Email: augustinbergeron@fas.harvard.edu.
‡Harvard Kennedy School. Email: gabrieltourek@fas.harvard.edu.
§Department of International Development, London School of Economics. Email: j.weigel@lse.ac.uk.

[1]Note to the conference conveners: This draft was written as a submission to the 2019 National Tax Association Conference *before endline survey enumeration is completed*. Current results reflect outcomes from admin data plus initial endline survey data. The endline survey will be complete by August 2019. If selected, a completed draft will be available before the NTA conference.

1 Introduction

There is increasing agreement about the role of state capacity in economic development (Acemoglu, 2005; Besley and Persson, 2009; Fukuyama, 2011).Fiscal capacity is essential for states to provide public goods and enforce contracts (Kaldor, 1965; Besley and Persson, 2009). Moreover, tax collection can motivate citizens to exert greater effort in participating in politics and holding the government accountable (Tilly, 1985; Weigel, 2018a). Recent empirical work finds that fiscal capacity is strongly correlated with inclusive political institutions (Acemoglu, Naidu, Restrepo, and Robinson, 2013; Besley and Persson, 2009, 2011) and long-run growth (Dincecco and Katz, 2016). But how do states trapped in a low-tax, low-capacity equilibrium spur citizens to start paying taxes?

In a seminal contribution, Levi (1988) notes that rulers have different optimal revenue maximization strategies depending on the strength of the state relative to society, the transaction costs of tax collection, and ruler's time horizons. The two classic modes of revenue generation she examines are centralized tax collection, in which rulers deploy and monitor collectors directly, and tax farming, in which rulers empower local elites to collect taxes for a price. Generally, centralized collection is more costly to rulers, but it can lead to higher revenues if a state is strong. Tax farming is cheaper, but opens the possibility of mismanagement by local elites. These two modes of tax collection remain viable alternatives for governments around the world today. Although pure tax farming is rare, local elites play a key role in tax collection in many countries, particularly developing ones (Kasara, 2007; Brautigam, Fjeldstad, and Moore, 2008; Prichard, 2015; Henn, Paler, Prichard, Samii, and de la Sierra, 2017). Indeed, in many parts of sub-Saharan Africa, governments have increasingly engaged local chiefs in their efforts to collect taxes (Baldwin, 2015; Jibao, Prichard, and Van den Boogaard, 2017; Moore, Prichard, Fjeldstad, et al., 2018), reversing the trend toward the centralization of revenue mobilization after independence.

This paper examines a field experiment investigating the tradeoff between central and local tax collection in the context of a property tax campaign in Kananga, D.R. Congo (DRC).[2] In collaboration with the provincial government, we randomly assigned neighborhoods of Kananga to different modes of property tax collection. In neighborhoods assigned to central tax collection, agents of the provincial tax ministry conduct a census of taxable properties and collect the tax in person, issuing printed receipts to payers. In contrast, in neighborhoods assigned to local tax collection, local city chiefs are charged with these same tasks. These chiefs are meant to act as the "eyes of the state" in local neighborhoods, communicating grievances and demands up to the authorities and organizing a weekly informal labor tax known as *salongo* (Olken and Singhal, 2011). However, it is an unsalaried position typically held by high-status individuals who have lived for a long time in the neighborhood. City chiefs are

[2]The provincial capital of Kasai Central, Kananga has roughly 1 million inhabitants.

thus analogous to the types of local elites who have engaged in tax farming historically.[3] We provide experimental evidence on the effects of deploying central collectors or empowering local elites to collect taxes on citizen tax compliance, as well as other governance outcomes.

We find that local collection generated 36% higher tax compliance than centralized tax collection. Approximately 11% of property owners paid the tax when a local chief collected, while only 8% paid when a central agent collected. In a pure control group, citizens were expected to pay the tax themselves at the tax ministry (as was the status quo before 2016), but very few actually did so. On average, door-to-door collection raised compliance by more than 76 times the status quo level.

Why did local tax collectors outperform central collectors? There are several potential theoretical explanations. First, local chiefs have local knowledge about citizens' ability and willingness to pay — as well as the timing of income shocks — that they can exploit to target potential tax payers more efficiently. Second, local chiefs may be more trusted as tax collectors, thereby activating citizens' intrinsic tax morale. Third, perhaps they can more credibly threaten sanctions to nonpayers. Although it is unlikely the threat of formal state sanctions would be more credible from chiefs, they could threaten informal sanctions, such as more labor tax participation or social exclusion.

Two hybrid treatment arms help pin down these possible mechanisms. First, in neighborhoods assigned to a third hybrid treatment arm, "Central Plus Local Information," central tax collectors did tax collection but only after a half-day consultation with the local chief. In this consultation, the chief went line by line over the tax register for the neighborhood, indicating to the central collector which households were (a) able to pay, and (b) willing to pay. In other words, this meeting transfers key aspects of local knowledge from the chief to the central collector. If local information fully explains the gap between chiefs and central collectors, then central collectors in this treatment should rival their local counterparts.

Preliminary results suggest that local information does not close the gap: compliance rates are similar in this treatment to the central treatment arm. However, providing central collectors with local information does improve the overall efficiency of tax collection. Central agents respond to the information from the chief by conducting fewer total tax visits but targeting households identified as having higher ability or willingness to pay. They thus achieve the same level of tax compliance as other central agents but at lower cost, thanks to the chiefs' information.[4]

The second hybrid treatment arm is a team composed of one central collector and one local collector. If each type of collector possess certain advantages, and these advantages are complementary, then teams of central and local collectors working together may lead to

[3] City chiefs, known as *chefs d'avenue*, *chefs de localité*, or *chefs de quartier* are a common institution throughout Francophone Africa (Honig, 2017).

[4] We are collecting information to quantify the cost savings precisely.

the largest increases in tax compliance. Central collectors may have the advantage of more credibly threatening formal punishment, or more credibly promising large-scale public goods provision from the provincial government. On the other hand, as noted above, local collectors may possess advantages in the form of local information, greater activation of tax morale, and more credible threat of local sanctions. Neighborhoods in the "Central X Local" arm thus received a collector team consisting of one central collector and one local chief. Interestingly, this treatment arm appears to have led to the lowest level of total tax receipts. The challenges encountered in this arm are reminiscent of the poor results in the hybrid treatment arm in Alatas, Banerjee, Hanna, Olken, and Tobias (2012).

We also examine other outcomes of these tax collector treatments. First, we find no differential impacts across treatments on measures of corruption and trust of the state. Examining channels for the greater effectiveness of local collectors, we find no evidence that lower transaction costs of collection or greater sanctioning power allow chiefs to do more collection. Finally, preliminary results from endline data collection (ongoing at the time of writing) indicate that local chiefs possess greater ability to motivate tax morale among citizen taxpayers within their domain, compared to collectors from the central tax ministry. Property owners report believing less revenues will be diverted to corruption and more spent on public goods in Local collection areas compared to Central collection areas. These findings highlight the importance of tax morale channels in generating compliance in settings where compliance and the capacity of the state to provide public goods and services are extremely low. Employing trusted actors such as local chiefs in the act of revenue collection may be an effective strategy both to raise much-needed revenues and to initiate a virtuous cycle of tax compliance and state capacity.

The rest of the paper is organized as follows. Section 2 describes the contributions of this paper to strands of literature. Section 3 describes the setting, Section 4 the experimental design, and Section 5 the mechanics of the tax campaign. Section 6 discusses the data and empirical strategy, Section 7 the results, and Section 8 concludes.

2 Related literature

This study aims to contribute to the literatures on fiscal decentralization and taxation in developing countries.

2.1 Central versus local tax collection

The canonical theory of fiscal federalism states that local governments can provide an optimal mix of taxes and public goods (Tiebout, 1956; Oates, 1999). According to this theory, interjurisdictional competition efficient, promoting economic growth (Weingast, 1995). A second

wave of studies showed that the assumptions of these models were too restrictive and did not necessarily apply to the developing world. In reality, elite capture of local governments (Bardhan, 2002), soft budget constraints (Rodden, 2006), the lack of a clear demarcation of authority (Liesbet and Gary, 2003), and perverse political incentives (Ardanaz, Leiras, and Tommasi, 2014) demonstrate that decentralization is no panacea.

A crucial dimension of decentralization is who collects taxes. Indeed, a fundamental decision facing governments is whether to deploy their agents to enforce tax collection or to farm out tax collection to local elites. States have faced this tradeoff throughout history (Levi, 1988). Most premodern states also relied heavily on indirect forms of local tax collection, such as tax farming. The main advantage of this technique was that it provided rules with a predictable flow of revenue (Kiser and Karceski, 2017). Because tax agents are residual claimants, tax farming is thought to be efficient (Kiser, 1994). For this reason, tax farming has been proposed as a cost-effective alternative to a centralized tax system (Azabou and Nugent, 1988). However, critics have pointed out that it can lead to overzealous taxation, increasing the need for monitoring, to prevent abuse (Stella, 1993).

In the 21st century, many states — especially low-capacity states — continue to experiment with models of local tax collection in which chiefs and other local elites play a central role (Kasara, 2007; Baldwin, 2015; Jibao, Prichard, and Van den Boogaard, 2017). To date, however, there is little quantitative evidence on when central collection is likely to outperform local collection, and vice versa, as well as over implications for local and central governance outcomes. Khan, Khwaja, and Olken (2015) experimentally vary contracts of tax collectors in Pakistan and find that a tax-farming contract boosts revenues but also increases bribes. However, they do not vary the extent to which central state agents or local elites are charged with tax collection.

To the best of our knowledge, our study will provide the first experimental evidence on this tradeoff between local and central tax collection. Unlike Khan, Khwaja, and Olken (2015), we hold constant the incentives of tax collectors: both types of collectors receive bonuses based on their deposits to the state account.[5] Instead, in collaboration with the provincial authorities in Kasai Central, we randomly vary whether neighborhoods receive door-to-door tax visits by agents of the provincial tax ministry or local city chiefs. The reduced-form effect of central and local tax collection on compliance is of theoretical interest given the salience of this tradeoff facing governments throughout history. Moreover, it contributes to a growing literature about the role of local, informal agents in performing services often associated with the formal state in developing countries Lund (2006); Cheema, Khwaja, and Qadir (2006); Binzel, Field, and Pande (2013); Lust and Rakner (2018).[6] Finally, it is of policy importance

[5] All collectors in the study have contracts analogous to those in Khan, Khwaja, and Olken (2015), in which collectors receive as a bonus a percentage of the funds they deposit to the state account. Such performance-based pay is how the provincial tax ministry in Kananga has typically paid its agents.

[6] Specifically, in the developing world, taxation and public good provision are often overseen by a mix of

for low-capacity states seeking to boost their tax take.

2.2 Tax compliance in developing countries with low state capacity

The paper also explores why citizens pay taxes in local and central tax collection arms, which yields insights about the determinants of tax compliance in developing countries with low-capacity states.

According to standard theories, a taxpayer's decision to evade is determined by the probability of detection, the magnitude of the punishment, and the tax rate (Allingham and Sandmo, 1972). Given that the probability of audits conditional on evasion is typically low, this model predicts low compliance. In contrast, empirical evidence shows that compliance is higher relative to the predictions of workhorse models (Alm, 1999; Torgler, 2002). Different explanations have been proposed for this discrepancy. In particular, some contributions introduce intrinsic motivation or "tax morale" (Traxler, 2010; Frey and Torgler, 2007) and provide evidence that tax compliance is a complex decision involving trust in state institutions, expectations of future public goods provision, and perceptions of corruption (Fjeldstad and Semboja, 2001; Tyler, 2006; Luttmer and Singhal, 2014).

Recent empirical work examines several parameters determining tax compliance. A well-established finding is that an increase in the probability of audits reduces evasion (Pomeranz, 2015; Carrillo, Pomeranz, and Singhal, 2017; Kleven, Knudsen, Kreiner, Pedersen, and Saez, 2011; Blumenthal, Christian, Slemrod, and Smith, 2001). Scartascini and Castro (2007) study the effectiveness of different information treatments: deterrence, public good provision, and equity. Drago, Mengel, and Traxler (2015) find that the effect of letters about tax compliance to potential evaders spills over onto untreated neighbors when treated subjects have higher network centrality. Hallsworth, List, Metcalfe, and Vlaev (2017) modify different features of tax morale messages and find that those referring to local norms — rather than to general norms— elicit higher compliance. Carrillo, Pomeranz, and Singhal (2017) find that third-party reporting for firm income reduces tax evasion. Perez-Truglia and Troiano (2015) implement a "shaming" treatment that emphasizes the online visibility of debtors and find that it increases the probability of repayment only among holders of small debts.

Our study advances this literature by examining the mechanisms through which local and central tax collection generate compliance among citizens. Varying the identity of tax collectors changes a number of parameters in the citizen's decision to pay or evade taxes. As noted above, central collectors are more strongly associated with the state and thus might represent a more credible threat of punishment. On the other hand, local collectors may be

state and non-state actors. Highlighting the importance of embedded local actors in fulfilling such functions (usually assumed to be the purview of the formal state), Lust and Rakner (2018) characterize this exchange as "social extraction". In their terminology, our treatment arms could thus be seen as different types of "social extraction".

more trusted by citizens and thus may more easily activate their tax morale. Local collectors also may have knowledge about the ability and willingness to pay of individuals in their neighborhood that they can exploit to collect more efficiently.[7]

We seek to pin down these mechanisms in two ways. First, the Central Plus Local Information treatment arm neutralizes the informational advantage of local chiefs in tax collection, enabling us to estimate the importance of local information in citizens' decisions to pay in neighborhoods assigned to Local. Second, the Central X Local treatment will reveal if the proposed advantages of each collector type are complementary or not, which lets us test a number of hypotheses about the mechanisms.

Finally, our paper advances this literature, which has often focused on middle-income countries, by studying tax collection in one of the world's poorest countries with a very weak state. The Congolese state has at times been labeled "a kleptocratic state," "a failed state," and a "fragile state," among other undesirable monikers. Establishing tax capacity and increasing citizen compliance is a great challenge in a setting like Kananga. But arguably the hypothesized gains from improving tax collection — strengthening the state's productive capacity as well as the "governance dividend" — may be especially large as well.

3 Setting

With a population of some 6 million people, the total revenues of the Provincial Government of Kasai Occidental from 2010-2015 were around $2 million USD per year, less than $0.30 USD per person per year. The great majority of these revenues comes from mineral rents and gatekeeper-style transport fees. When surveyed in early 2016, fewer than 3% of households in the capital city of Kananga reported ever having paid property taxes. In a previous experiment in Kananga, tax collectors were sent to randomly selected neighborhoods in the city to boost property tax revenues (Weigel, 2018b). The program caused a 10 percentage point increase in property tax payment. Nonetheless, nearly 90% of households — almost all of which were visited by tax collectors — still refused tax payment. Since less than 1% appear to have paid bribes instead of the tax, the vast majority of citizens are simply non-compliant.

Provision of goods and services is likewise low. Most citizens do not have access to running water, electricity, or public education. The government does not regularly provide other public goods and services that are typically funded through local tax collection at the provincial level, such as road repair. The primary observable functions of the state are its police force and the presence of military personnel, though the latter are associated with the national government.

[7] Particularly if there is a bargaining component to tax collection, as modeled in Khan, Khwaja, and Olken (2015), local knowledge about income shocks may increase the bargaining power of the collector relative to central collectors who likely lack such knowledge.

In examining the link between tax collection methods, compliance, and receipt of state services, our experiment is conducted in an equilibrium where compliance and government capacity are extremely low. Our study can thus be viewed as relating to the initial steps of state-building as it relates to the social compact between citizens and government that is implicit in taxation — that citizens pay taxes in return for public goods and services.

4 Design

4.1 Treatment arms — Mode of tax collection

The mode of tax collection is randomized at the neighborhood level among the following five treatments. In all treatment neighborhoods (not control), a set of agents completes two tasks. First, they go door to door conducting a census and information campaign, during which they map all properties in the neighborhood and inform households the rate they are supposed to pay for the property tax. They also give them a flyer that contains some of this information (see Figure 1). If the household can pay taxes during the census visit, they also collect taxes on the spot, issuing receipts with a handheld receipt printer. Otherwise, they complete the second step, which is to return for tax collection according to appointments made with households during the census visit (or just making additional fly-by visits).

The main tax collection treatments vary the identity of the tax collectors who are supposed to complete these steps. While the identity of collectors varies, the training, equipment, and incentives of collectors is held constant.

T1. Central tax collection (C): Agents of the provincial tax ministry (DGRKOC) complete all steps of the property tax campaign (census and tax collection). This treatment arm is similar to that implemented in Weigel (2018a). Collectors work in teams of two and each team is assigned to two neighborhoods per month. Every month collectors are re-randomized in teams of two.

T2. Local tax collection (L): Local chiefs complete the steps of the campaign. These chiefs act as intermediaries between citizens and the government and can be thought of as the bottom link in the chain of the city-level government bureaucracy. They are typically in charge of: (1) organizing and enforcing weekly public good provision (*Salongo*), (2) communicating citizens' grievances to government authorities, and (3) mediating in local disputes. This position is appointed for life to an individual who already lives in the neighborhood. Often, it is given to an individual who is well-known in the neighborhood. To make treatments comparable, each chief is asked to pick an assistant, so each neighborhood assigned to local taxation is visited by a team of two.

T4. Central Plus Local Information (CLI): This arm is identical to the central tax collection treatment, except that, after completing the census, the central collectors meet with the avenue chief in the neighborhood to transfer knowledge about the capacity and willingness to pay of all individuals in that neighborhood. As will be specified in Section 6, the purpose of this treatment is to adjudicate between possible mechanisms. One prominent explanation of observed differences between treatment arms is that chiefs have more local information than central collectors. For instance, they might be able to identify low and high compliance types and thus target their effort more efficiently. Alternatively, they might have substantive knowledge about individuals that they can employ to have more bargaining power to convince them to pay. If the effect of this treatment arm is indistinguishable from the combined treatment, this is indicative that the advantage of chiefs is purely informational.

T3. Central X Local (CXL): Central and local collectors complete all steps of the campaign together. Central collectors are re-randomized to selected chiefs each month.

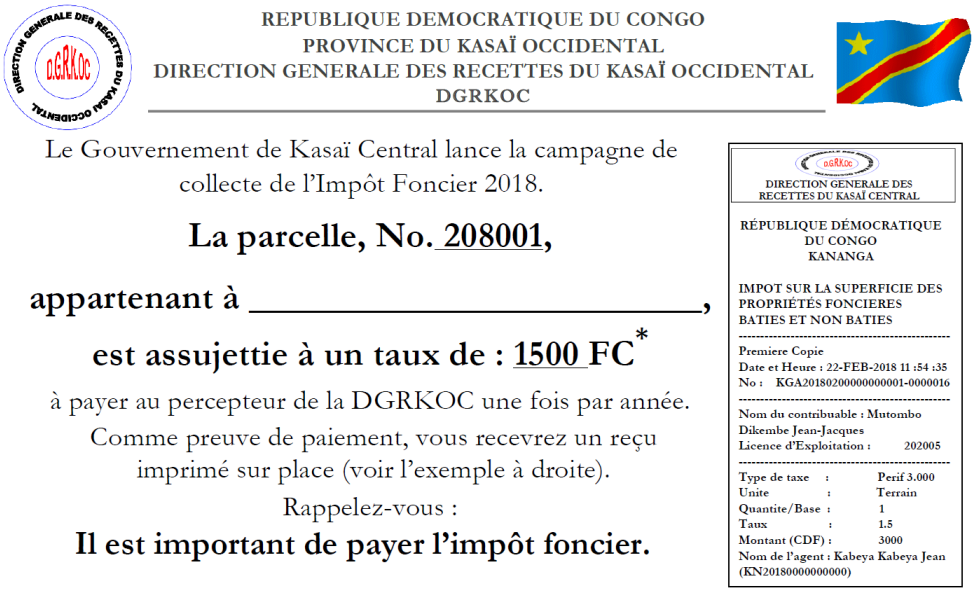
T5. Control: In a small number of neighborhoods, individuals are supposed to pay themselves at the tax ministry (the old system up to 2016). Two agents from the tax ministry visit each household in these neighborhoods, conducting a census that is identical to that administered in treatment neighborhoods except that individuals are informed they should pay at the tax ministry rather than pay collectors themselves.

Table 1 below shows the allocation of neighborhoods across treatments as well as the estimated number of property owners based on data from Weigel (2018a).

TABLE 1: TREATMENT ALLOCATION

Treatment	Central	Local	CLI	CXL	Control
J (Neighborhoods)	110	110	80	51	5
N (Households)	15,255	14,846	10,175	6,846	832

FIGURE 1: SAMPLE FLYER



REPUBLIQUE DEMOCRATIQUE DU CONGO
PROVINCE DU KASAÏ OCCIDENTAL
DIRECTION GENERALE DES RECETTES DU KASAÏ OCCIDENTAL
DGRKOC

Le Gouvernement de Kasaï Central lance la campagne de collecte de l'Impôt Foncier 2018.

La parcelle, No. 208001,

appartenant à _____,

est assujettie à un taux de : 1500 FC*

à payer au percepteur de la DGRKOC une fois par année.
Comme preuve de paiement, vous recevrez un reçu imprimé sur place (voir l'exemple à droite).
Rappelez-vous :
Il est important de payer l'impôt foncier.

DIRECTION GENERALE DES RECETTES DU KASAÏ CENTRAL

RÉPUBLIQUE DÉMOCRATIQUE DU CONGO
KANANGA

IMPOT SUR LA SUPERFICIE DES PROPRIÉTÉS FONCIERES BATIES ET NON BATIES

Premiere Copie
Date et Heure : 22-FEB-2018 11 :54 :35
No : KGA20180200000000001-0000016

Nom du contribuable : Mutombo Dikembe Jean-Jacques
Licence d'Exploitation : 202005

Type de taxe : Perif 3.000
Unite : Terrain
Quantite/Base : 1
Taux : 1.5
Montant (CDF) : 3000
Nom de l'agent : Kabeya Kabeya Jean (KN20180000000000)

4.1.1 Logistics pilot

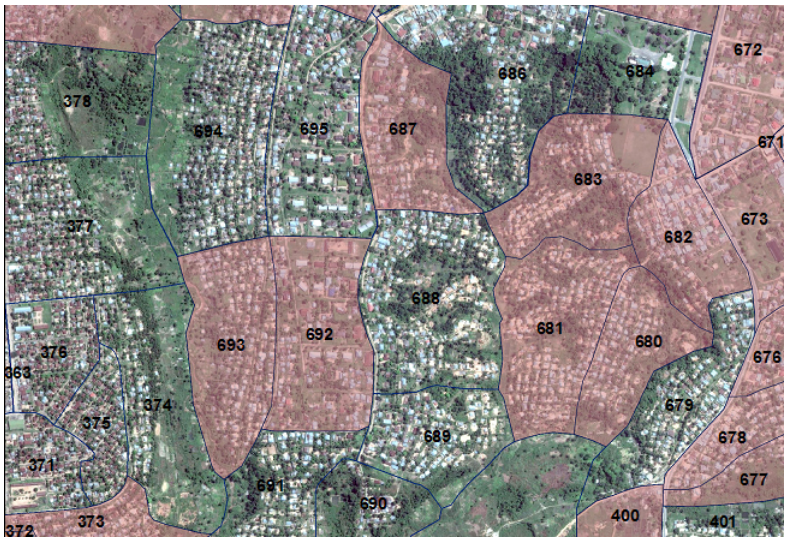
A logistics pilot was conducted in March-April 2018. The pilot had two main goals. First, we wanted to make sure that avenue chiefs — who are often older and less skilled with technology — would be able to work with the handheld receipt printers used on the tax campaign. Second, we wanted to test and optimize the informational flyers that would be distributed during the census visits. The pilot was conducted in eight city polygons in Kamilabi, a remote neighborhood in northwest Kananga. This neighborhood was selected strategically due to its isolated location to minimize potential informational spillovers.

4.2 Randomization

The unit of randomization is the neighborhood, or polygon, each of which was identified on a satellite map with boundaries like roads, ravines, or other natural features that would be easily identifiable from the ground (see Figure 2). There are 364 neighborhoods in total in Kananga.[8] We excluded the 8 neighborhoods that were part of the logistics pilot mentioned above. This leaves 356 neighborhoods for the full randomization.

[8] We exclude the commune of Nganza, to the south of the city, where in 2017 violence led a majority of the population of Nganza to move elsewhere in the city. When designing the tax campaign, the government decided that it would be too difficult to do tax collection in this commune.

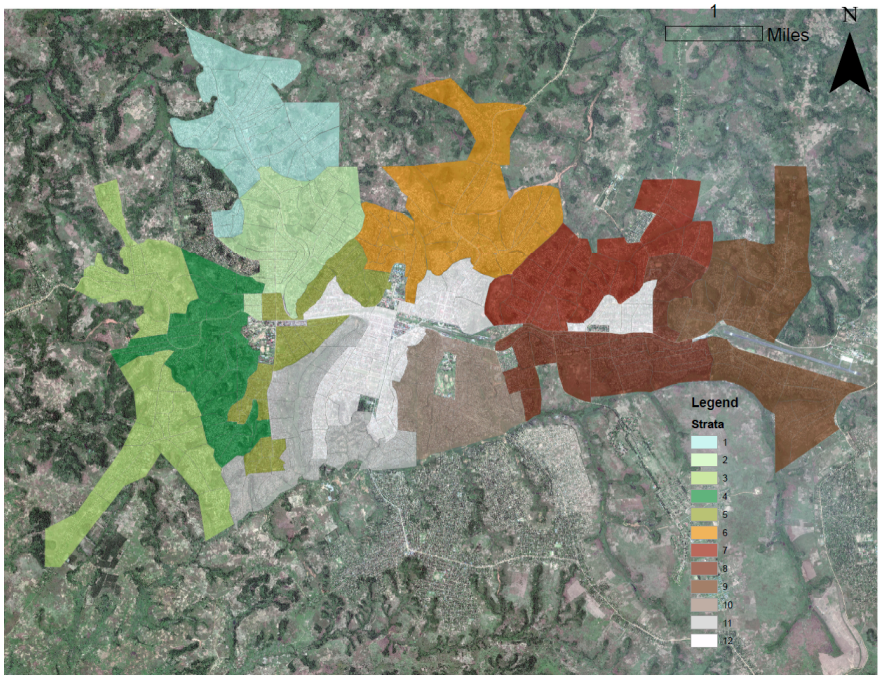
FIGURE 2: THE UNIT OF RANDOMIZATION: NEIGHBORHOODS OF KANANGA



We employ a block-randomized design, stratifying on three variables:

1. Geographic stratum: We group the city neighborhoods into twelve strata that take into account (a) geographic regions of the city and (b) whether neighborhoods are deemed the "city center" or "the periphery" by the tax ministry. Two of these strata correspond to downtown. This ensures balance on the extent to which a neighborhood is central/peripheral, which is a good proxy of the importance of the corresponding locality chief and the degree of enforcement of tax collection. The strata are displayed in Figure 3.

FIGURE 3: GEOGRAPHIC STRATA



2. Treatment status in the 2016 tax campaign: This is a dummy capturing whether the neighborhood had been assigned to treatment in the 2016 tax campaign, studied in Weigel (2018a).

3. Past experience of local chiefs collecting taxes: We create temporary strata based on the two variables above and, for each of these, find the median proportion of chiefs (ranked 1-5 according to the chief selection procedure) per neighborhood who ever collected taxes and split each temporary stratum into two additional substrata around the median.

Using data from the baseline survey and Weigel (2018a), we conducted a balance check on the following set of variables: 1) average highest level of education of respondents in a neighborhood, 2) percentage of houses affected by a ravine, 3) percentage of houses with walls in good condition (above the median), 4) whether citizens know the name of their avenue chief, 5) the perceived degree of responsiveness of the local chief, 6) the percentage of houses that paid taxes in the 2016 campaign, 7) whether a neighborhood has been affected by the conflict in the Kasai region, and 8) the number of chiefs per neighborhood (among the top five chiefs according to the ranking described in section 3.3 below).

TABLE 2: RANDOMIZATION BALANCE

	Control Mean	Central	Local	Central Plus Local Info	Central X Local
	(1)	(2)	(3)	(4)	(5)
Education	2.7	0.148*	-0.087	-0.065	0.013
		(0.083)	(0.076)	(0.075)	(0.061)
% Ravine	0.583	0.004	-0.027	0.014	-0.008
		(0.070)	(0.067)	(0.062)	(0.043)
% HH Walls Good Condition	0.9	-0.031	-0.143	-0.007	0.160
		(0.201)	(0.208)	(0.196)	(0.135)
Knowledge of Chief	0.845	-0.154	0.177	0.054	-0.052
		(0.168)	(0.153)	(0.154)	(0.132)
Chief Responsiveness	2.96	0.036	-0.092	-0.054	0.067
		(0.079)	(0.074)	(0.067)	(0.062)
% Paid in 2016	0.12	-0.532*	0.508*	0.004	-0.142
		(0.279)	(0.287)	(0.244)	(0.183)
Affected by Conflict	0.2	-0.151	-0.043	-0.007	0.128
		(0.160)	(0.171)	(0.132)	(0.112)
# Chiefs per Polygon	4.4	0.022	-0.025	0.002	0.000
		(0.028)	(0.030)	(0.025)	(0.022)
P-val, joint sig.		0.356	0.400	0.993	0.681

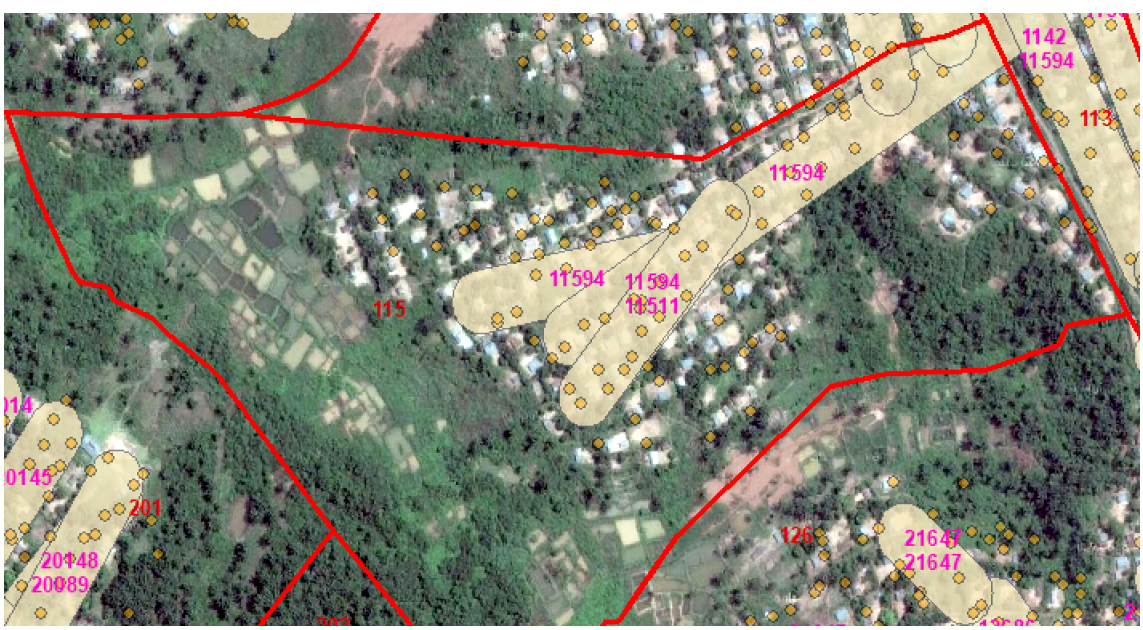
Notes: This table reports the coefficients from balance tests estimated by regressing a set of baseline household characteristics on individual treatment indicators. Each column shows the estimates from a separate regression of the full set of characteristics on an indicator for a treatment arm. The p-value from the joint significance test is reported in the bottom line.

We randomize 100 times and pick the treatment allocation that has the minimum highest t-statistic of a regression of each variable in the balance set on each treatment status. Table 2 reports randomization balance.

4.3 Sampling of chiefs

To select the chiefs in charge of tax collection, we implement the following procedure. For each chief, we take the GPS coordinates of the start- and end-points of each of their avenues. We connect these points with a straight line, create a 20-meter buffer around it, and aggregate these buffers by chief to construct each chief's "domain". We overlay these domains with population data drawn from Weigel (2018a). For each city neighborhood, we rank chiefs according to the population count covered by their domains. A neighborhood is assigned to the chief whose domain covers the most population living in that specific neighborhood. If that chief is not available, we select the one ranked immediately below. Central collectors are randomly chosen amongst those DGRKOC agents who completed a collector survey. This survey contains questions concerning a collector's basic characteristics, their cognitive abilities, as well as their social preferences (i.e., tax morale, progressivity, targeting, preferences about government spending, etc.). The neighborhood shown in Figure 4 (115) has two chiefs: 11594 (with 3 avenues) and 11511 (with 1 avenue). The procedure picks the former. The orange dots represent population.

FIGURE 4: CHIEF SELECTION PROCEDURE



5 Campaign mechanics

5.1 Timing

There are 41 central collectors (agents of the provincial tax ministry, DGRKOC) working on the tax campaign and 113 local (chief) collectors. Chiefs in the Local arm also have assistants, of whom there are 71 unique individuals. Each team of collectors in Central and Central Plus Local Information is assigned to work in two neighborhoods per month. Each team of collectors in the Local and Central X Local treatment arms (both in the local and combined treatment arms) is assigned to work in one or two neighborhoods per month (depending on the size of a chief's jurisdiction). The tax collection campaign runs for just over six months.

5.2 Stages

The taxation campaign consists of two stages: census and taxation.

Before the start of the campaign, collectors are trained by the tax ministry and by members of the research team. Training sessions, conducted at the tax ministry, introduce future collectors to the taxation campaign protocol and teach basic aspects of the property tax system in Kananga (rates, exemptions, how to identify different house types, etc). Collectors also learn how to use the handheld receipt printers.

The first step of the campaign is the census. The census is implemented in all neighborhoods (including the five control neighborhoods). Teams of tax collectors visit every house in each neighborhood, accompanied by enumerators (who work for the research team rather than the government) trained to use tablets with GPS capabilities. The census visit serves three purposes. First, citizens are informed about the campaign. Second, houses are assigned a unique code and are given the flyers containing the tax rate and the information treatment. The codes enable collectors to return to the neighborhood alone knowing its boundaries based on the codes, which begin with the first digits of the neighborhood. This effectively produces a cadastral map of the city. Finally, enumerators fill out a short survey recording details about the transaction that we will use in the analysis.

TABLE 3: CAMPAIGN STAGES

Stage	Period	Collectors	Enumerators
Stage 1 : Census	First days of each month	Yes	Yes
Stage 2 : Tax collection	Rest of the month	Yes	No

We administer the census in control neighborhoods for two main reasons. First, this helps rule out a purely informational mechanism behind any observed increase in compliance in

the other treatment arms (i.e. citizens in treated neighborhoods pay more only because those in control neighborhoods remain uninformed about the need to pay the property tax). The flyers in the control neighborhoods inform citizens how much they should pay and that they are supposed to go to the bank to pay. This was the status quo of tax collection throughout Kananga until the 2016 property tax campaign. Second, it is during the census that flyer messages are randomly assigned. Doing the census in control areas enables us to estimate the effect of our various treatments in a full regression with dummies for all of the different treatment arms and their interactions.

Upon completion of the census, tax collectors begin collection, which lasts for the rest each tax month. During taxation, enumerators no longer accompany tax collectors.

In all treatment arms citizens can pay either during the census or subsequent tax visits. Collectors bring the money to the provincial tax ministry. Collectors are equipped with handheld receipt printers to issue receipts for the taxpayers. Two receipts are automatically printed in the field, one for the taxpayer and one for the collector. Collectors bring the money to the provincial tax ministry, account for the money they deposit, and need to justify any discrepancy between the total sum on their report and the money they have with them.

Importantly, collectors can also tax households during the census. This has the advantage of holding targeting constant, since at this stage collectors are forced to visit every household. Moreover, because of the census survey (discussed in the next section), we observe key details about tax transactions that occur during the census, which allows us to test a range of hypotheses about why citizens pay the property tax.

For the fourth treatment arm (Central Plus Local Information) the two assigned central collectors have a meeting with the chief who would have worked in the neighborhood had it been selected for the local treatment arm. During this meeting, the enumerator shows the chief one by one photographs of all the compounds in the neighborhood along with the name of the property owner. The chief then indicates if he thinks a given household will pay "very easily, easily, or with difficulty." The collectors record the chief's recommendation with a pen. The enumerator also records this information in the survey. After the meeting, armed with this information, collectors resume work.

Consistent with standard practices at the tax ministry, all collectors (central and local) receive a bonus for working on the campaign. First, they receive a bonus for conducting the census, equal to 30 CF per house visited. Second, they receive a bonus that is proportional to the amount of money that they submit to the state account (approximately 30% of the total). This bonus is constant across all treatment arms.[9]

[9] Details of the bonus, which will be studied in another related project, can be found in the analysis plan for the study "The Elasticity of Tax Compliance: Evidence from Randomized Property Tax Rates."

6 Data and Empirical Methodology

6.1 Data

6.1.1 Respondent baseline survey

We administer surveys at baseline to 4,343 randomly selected households — 12 per neighborhood. Randomization was achieved by having enumerators visit every Xth house, where X is determined by the estimated number of houses in the neighborhood to yield 12 surveys per neighborhood. The baseline survey instrument covers a range of topics, including but not limited to: demographics, property characteristics, governance, public goods, experience with taxation and (formal and informal) payments to the state, property taxes, rental taxes, city chiefs, political beliefs and participation, and social networks.

6.1.2 Chief survey

This survey measures characteristics of local chiefs: their tribal affiliation, level of education, familiarity with technology (tablets), social networks, official duties and tasks, relationship with city authorities, knowledge of the citizens in their jurisdiction, knowledge of the tax system, past experience collecting taxes, preferences for redistribution and public goods, beliefs about state capacity, trust in different institutions, and political affiliation. The sample include 1,084 chiefs.

6.1.3 Collector survey

This survey measures characteristics of collectors. All collectors who work on the campaign, be they tax ministry agents, chiefs or their assistants participate in this survey. It includes: a reading and a typing test, questions on their experience collecting taxes and working for the DGRKOC, beliefs about taxation, preferences for redistribution, public goods, state capacity, trust in different institutions, tax morale, willingness to pay the property tax under different hypothetical tax rates. This survey is administered before and after taxation in order to measure the impact of taxation on tax collectors. This sample include 493 collectors.

6.1.4 Census survey

This survey is conducted during the census. It records the code that is assigned to each household, its geographic coordinates, the name of the property owner, the property tax rate faced by each household (assigned on the spot during the census), and whether a household

is exempt from the property tax.[10] It also contains the protocol collectors read informing respondents about the tax campaign. This sample include 47,921 households.

6.1.5 Midline survey

This survey is administered to every household in the city by enumerators after tax collection is finished in a neighborhood and its goals are to verify the work of tax collectors in a neighborhood and to measure interactions between respondents and tax collectors. The midline survey covers a range of topics, including but not limited to: whether a household was visited by tax collectors, the number of times it was visited, whether it paid the property tax, whether the respondent was given a receipt, the reasons why the respondent paid taxes, whether the household head and the tax collectors knew each other previously, and whether tax collectors asked respondents for bribes during the campaign. This sample includes 36,495 households.

6.1.6 Respondent endline survey

This survey is conducted after the campaign and contains questions about tax compliance and morale, the perceived fairness of different modes of tax collection, property-related disputes, attitudes towards the state, beliefs about the government and chiefs, engagement with the government and chiefs, use of formal and informal sectors, and other outcomes of interest. Enumerators will revisit the randomly chosen sample of respondents for the baseline survey and a set of new randomly sampled households.[11]

6.1.7 Administrative data

The handheld receipt printers store each receipt in their memory. This generates administrative data used by the government to track progress in the tax campaign. The printers collect the collector's name and ID number, date and time stamps, neighborhood number, the house category and identification number, the tax rate, and the amount paid. The sample include 3,755 payments.

6.2 Hypotheses and estimation

This section introduces the theoretical expectations and the estimation strategy. The most general estimating equation we use is:

[10] The following cases are exempt from the property tax: 1) state-owned properties, 2) schools, churches, and scientific or philanthropic institutions, 3) houses owned by the elderly (55 years or above), widows or disabled people, 4) houses in construction or owned by international organizations.

[11] We will publish an addendum to this PAP with more specific hypotheses about certain endline outcomes before the launch of the endline survey in early 2019.

$$y_{ijk} = \beta_1 C_{jk} + \beta_2 L_{jk} \; + \; \beta_3 CLI_{jk} \; + \; \beta_4 CXL_{jk} \; + \mathbf{X}_{ijk}\mathbf{\Gamma} + \; \mathbf{X}_{jk}\mathbf{\Phi} + \; \alpha_k + \epsilon_{ijk} \qquad (1)$$

where i indexes individuals, j indexes neighborhoods, and k indexes strata used for randomization. Standard errors are clustered at the neighborhood level (356 in total). y_{ijk} denotes an individual-level outcome of interest (usually tax payment), α_k denotes strata fixed effects, and $\mathbf{X}_{ijk}$ and $\mathbf{X}_{jk}$ are individual and neighborhood-level covariates. Finally, C_{jk} and L_{jk}, denote the local and central treatments, respectively, and CXL_{jk} and CLI_{jk} denote the two "hybrid" treatments described above. Each of the corresponding coefficients estimate the average causal effect of each treatment arm on the outcome of interest. In an alternative specification, controls will be interacted with treatment. There are two main sets of analysis we run.

1. Analysis using the universe of taxpayers. For our primary outcomeâ tax paymentâ we will use administrative data to evaluate the effect of the various treatment arms on compliance. For this analysis, we have the universe of compounds in Kananga, approximately 47,921 according to data from Weigel (2018). We will also conduct an analysis of the impacts of the messages contained on tax flyers using this dataset on the universe of taxpayers. For individual covariates, we can use household-level variables collected during the census survey and during the midline survey. In our estimation, we will include one specification with no covariates and additional specifications with the following covariates:

* **Individual-level covariates:** A dummy indicating whether a household paid the property tax in the past, an index of estimated household wealth (an index constructed from household observables, such as roof type, building materials, and condition of the fence), and a dummy variable for government workers, including avenue and locality chiefs.
* **Neighborhood-level covariates:** Distance to city center, population, and past average tax compliance. In addition, we will test for balance across a larger set of individual- and neighborhood-level variables and we will show robustness to controlling for any that are significantly imbalanced.

2. Analysis using endline survey sample. For outcomes not included in the administrative data or in surveys administered to every household in Kananga, we rely on an endline survey. Our estimated endline sample size will be at least as large as our baseline sample (N= 4,343). Our estimation approach will be similar to that noted above, except that we will have a larger set of possible individual-level covariates. At the time of writing, endline data collection is approximately 5% complete.

7 Results

In Section 7.1 we examine the impacts of the collection method interventions on tax collection and non-tax collection outcomes. Section 7.2 explores the mechanisms through which collection outcomes may differ across treatments.

7.1 Main results

7.1.1 Effects on tax compliance

Table 4 displays the impact of the collection interventions on tax payments by property owners. We first consider the impact on an indicator for paying the property tax that is drawn from the administrative tax receipts. This outcome is measured at the individual level and captures the payment decision of an individual property owner within a neighborhood. Column 1 reports impacts pooling household types, and columns 2 and 3 report impacts separately by periphery and midrange households. In the pooled sample, payment in the control group is 0.1% (99.9% of property owners do not pay the tax when they must submit the payment at the tax ministry or bank themselves), and it is only households in the midrange category that pay.

We find substantial impacts of door-to-door collection methods on compliance with the tax. Door-to-door collection increases payment likelihood to at least 7.6%, which represents a increase of 76 times relative to the status quo method of collection (control). The effect is more pronounced for periphery households, where the treatment effects are larger and baseline compliance essentially zero.

Examining the results by collection intervention, we see that Local collection has the largest impact on tax payments. We begin by addressing the most relevant comparison: Central vs. Local[12]. Compliance is 10.8% on average in the Local arm, whereas it is only 8% in the Central arm. The bottom panel of Table 4 shows tests for the equality of coefficients across treatment arms. We find that we can reject equality between Central and Local at the 1% level. This effect is driven by collection among periphery households, which comprise the vast majority of properties, whereas Central collection is higher than Local collection among midrange households, though the levels are not statistically different.

Turning to citizen-reports of tax payment drawn from the monitoring survey in columns 4, 5, and 6, we find that these patterns hold: Local collection neighborhoods have 3.3 percentage point higher tax payment than Central collection neighborhoods, and we can reject the equality of coefficients at the 5% level. This effect is again concentrated among periphery households. The level of reported tax compliance among property owners is much higher

[12]We address comparisons to the Central Plus Local Information and Central X Local treatment arms in Section 7.2.

than that captured in the tax receipts — 71% higher in Central neighborhoods and 57% higher in Local neighborhoods. This may reflect either over-reporting on the part of property owners, elicitation bias that may derive from incentives to avoid punishment for non-compliance or the perception that they are unable to pay the tax, or may reflect a gap in actual payments that may constitute evidence of corruption — if tax collectors pocket payments without granting a receipt. We explore impacts on bribe-taking behavior in the following section.

TABLE 4: EFFECTS ON PROPERTY TAX COMPLIANCE

	Tax Receipts			Citizen-Reported		
	Pooled	Periphery	Midrange	Pooled	Periphery	Midrange
	(1)	(2)	(3)	(4)	(5)	(6)
Central	0.080***	0.083***	0.067**	0.137***	0.139***	0.135**
	(0.020)	(0.020)	(0.022)	(0.031)	(0.033)	(0.042)
Local	0.108***	0.116***	0.057**	0.170***	0.174***	0.107**
	(0.019)	(0.020)	(0.019)	(0.031)	(0.033)	(0.039)
Central + Info	0.079***	0.082***	0.064**	0.146***	0.145***	0.124**
	(0.020)	(0.020)	(0.020)	(0.033)	(0.035)	(0.045)
Central X Local	0.076***	0.087***	0.024	0.140***	0.139***	0.141**
	(0.021)	(0.022)	(0.019)	(0.034)	(0.036)	(0.043)
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
House Type FE	Yes	No	No	Yes	No	No
Polygons	356	356	356	356	356	356
Observations	39,894	34,734	5,160	22,267	19,910	2,357
Control Mean	0.001	0	0.008	0.001	0	0.008
Central vs. Local	0.004	0.002	0.504	0.034	0.032	0.308
Central vs. CLI	0.927	0.956	0.849	0.653	0.748	0.771
Central vs. CXL	0.795	0.765	0.007	0.88	0.984	0.865
Local vs. CLI	0.007	0.004	0.594	0.209	0.151	0.599
Local vs. CXL	0.012	0.046	0.028	0.125	0.083	0.312
Joint Sig.	0.003	0.002	0.022	0.129	0.093	0.668

Notes: This table reports estimates from equation (1), regressing an indicator for tax payment at the individual property owner level on indicators for the treatment interventions assigned at the neighborhood level. The excluded category is the control group. The outcome can take values of greater or lesser than 1 if tax receipts or citizen reports exceed or fall below the payment amount assigned to a property. We include fixed effects for randomization strata and cluster standard errors at the neighborhood level. Columns 1 and 4 include house type fixed effects, while columns 2 and 5 report estimates for periphery households only, and columns 3 and 6 report estimates for midrange households only. Columns 1–3 report impacts on administrative tax receipts, where the sample is all households visited in the census. Columns 4–6 report impacts on citizen-reported payments, where the sample is all households visited in the midline monitoring survey. The bottom panel reports the p-values from tests for equality of equality of coefficients.

Our results show that local collection outperforms centralized collection in generating extensive margin compliance, yielding a 36% increase in tax receipts. Yet even with door-to-door collection, the level of compliance remains very low — 92.6 to 89.2% of property owners continue to escape their obligations. In Section 7.2 we discuss channels for the observed dif-

ferences in the effectiveness of collection arms to shed light both to explain their differential impacts but also to shed light on the prevailing low level of compliance in general.

7.1.2 Effects on non-tax outcomes

Beyond the revenue impacts of collection methods, one may be concerned that increases in tax compliance come at the cost of increased corruption or crowd out other tax bases. We examine the impact of the treatments on a measure of bribes and contributions in to informal taxes.

We solicit the bribe and informal tax measures in the midline monitoring survey. To capture bribes, we ask property owners if they paid "transport" to the tax collector — a colloquial expression for payments made to government officials outside the scope of compliance with legal tax obligations or fees for service — and, if so, the amount of the payment. In the baseline survey, 8.2% of individuals report making bribe payments to government officials in the last 12 months. Our measure of informal taxes comes from citizen-reported contributions to a local, informal public good institution called *salongo*. *Salongo* is a neighborhood institution, common throughout East and Central Africa, through which the local chief solicits contributions most often in the form of labor (though occasionally chiefs may request contributions of cash) to public good projects in the neighborhood, such as repair of roads, trash collection, and filling in of ravines created by erosion. In the control group at midline, 38% of individuals report participating in *salongo* in the last two weeks, with those participating contributing 4.2 hours over this period.

Table 5 displays the impacts of the treatments on bribes and informal taxes. Columns 1 and 2 show the impacts on bribes. The frequency or reported bribes in the context of the tax campaign is extremely low, less than 2%, and there are no significant differences across treatment arms in the likelihood of paying a bribe or the amount of payment. Columns 3 and 4 show the impact on participation in *salongo*. Property owners in door-to-door collection neighborhoods report lower participation on the extensive margin, but the levels are not statistically significant from that of the control group. Those contributing report higher, but not statistically different, contributions in hours worked in the door-to-door collection neighborhoods.

TABLE 5: EFFECTS ON BRIBES AND INFORMAL TAXES

	Bribes (Citizen-Reported)		Informal Taxes (*Salongo*) (Citizen-Reported)	
	Paid Bribe	Bribe Amount	Part. Salongo	Salongo Hours
	(1)	(2)	(3)	(4)
Central	0.006	105.428	-0.031	2.079
	(0.006)	(164.497)	(0.063)	(2.043)
Local	0.004	-46.961	-0.054	1.789
	(0.006)	(158.353)	(0.063)	(2.212)
Central + Info	0.007	135.420	-0.030	2.057
	(0.006)	(129.920)	(0.063)	(1.984)
Central X Local	0.007	-164.430	-0.031	1.178
	(0.006)	(207.555)	(0.066)	(2.077)
Strata FE	Yes	Yes	Yes	Yes
House Type FE	Yes	Yes	Yes	Yes
Polygons	356	356	356	356
Observations	39,894	449	19,424	6,758
Control Mean	0.01	700	0.384	4.233
Central vs. Local	0.387	0.292	0.437	0.631
Central vs. CLI	0.596	0.823	0.969	0.973
Central vs. CXL	0.692	0.183	1	0.026
Local vs. CLI	0.218	0.179	0.436	0.767
Local vs. CXL	0.286	0.538	0.488	0.215
Joint Sig.	0.535	0.301	0.808	0.06

Notes: This table reports estimates from equation (1), regressing measures of bribes and informal tax contributions on indicators for the treatment interventions assigned at the neighborhood level. The excluded category is the control group. We include fixed effects for randomization strata and house type and cluster standard errors at the neighborhood level. Column 1 reports impacts on an indicator for paying a bribe, and column 2 reports impacts on the bribe amount conditional on paying. Column 3 reports impacts on an indicator for participation in *salongo* in the last two weeks, and column 4 impacts on the amount of contribution in hours worked, conditional on contributing. The sample is all households visited in the midline monitoring survey. The bottom panel reports the p-values from tests for equality of equality of coefficients.

Our results show that distinct methods of tax collection do not carry different implications for corruption or crowd-out (or crowd-in) of informal tax contributions in the context of the campaign. The lack of impact on bribe-taking may derive from the monitoring of collectors involved in the campaign, as described in Section 5, or from the incentives provided to collectors. If bribes are collusive — an agreement between collectors and citizens through which citizens can make a smaller payment to the collector to avoid the tax — our citizen-reported measure may not capture the full extent of bribes. We interpret these results, however, as sufficient evidence that bribe-taking behavior does not different significantly across centralized or local methods of tax collection. The absence of an effect on contributions to *salongo*, particularly in Local collection neighborhoods, suggests that the collection of formal property

taxes is not linked to informal taxes — that citizens do not see both tax types as substitutable or complementary.

Finally, we examine impacts on trust of institutions at midline. These measures are solicited by asking property owners to separately rate their level of confidence in the provincial government, tax ministry and their local neighborhood chief. Table 6 displays the impacts of the treatments on trust across institutions. Values are measured on a four-point Likert scale, ranging from "No confidence at all" to "A lot of confidence". The mean levels of confidence are high — the average property owner in the control group rates confidence in all three institutions between "Some confidence" and "A lot of confidence". We see no impacts of treatment on these measures of trust. Trust in the provincial government and tax ministry is higher in the Central and Local collection arms, relative to control, and trust of the neighborhood chief is higher in Central but slightly lower in Local, however the levels are not statistically different.

TABLE 6: EFFECTS ON TRUST IN INSTITUTIONS

	Confidence in Institutions (Citizen-Reported)		
	Prov. Govt.	Tax Ministry	Local Chief
	(1)	(2)	(3)
Central	0.140	0.168	0.007
	(0.187)	(0.166)	(0.156)
Local	0.031	0.102	-0.033
	(0.194)	(0.174)	(0.165)
Central + Info	-0.113	0.130	0.001
	(0.185)	(0.174)	(0.159)
Central X Local	-0.030	0.030	-0.067
	(0.250)	(0.203)	(0.188)
Strata FE	Yes	Yes	Yes
House Type FE	Yes	Yes	Yes
Polygons	356	356	356
Observations	1,412	1,418	1,431
Control Mean	3.286	3.286	3.381
Central vs. Local	0.357	0.533	0.644
Central vs. CLI	0.047	0.764	0.945
Central vs. CXL	0.385	0.331	0.538
Local vs. CLI	0.251	0.829	0.691
Local vs. CXL	0.736	0.612	0.78
Joint Sig.	0.262	0.79	0.913

Notes: This table reports estimates from equation (1), regressing measures of trust in institutions on indicators for the treatment interventions assigned at the neighborhood level. The excluded category is the control group. We include fixed effects for randomization strata and house type and cluster standard errors at the neighborhood level. Measures of trust are drawn from questions about confidence in institutions, rated by property owners on a 1–4 Likert scale. Column 1 reports trust in the provincial government, column 2 trust in the tax ministry, and column 3 trust in the property owner's local neighborhood chief. The sample is all households visited in the midline monitoring survey. The bottom panel reports the p-values from tests for equality of equality of coefficients.

7.2 Understanding Channels

The results above show that local collection outperforms centralized collection in generating extensive margin compliance by a substantial magnitude. On net, the gains in collections do not come at the cost of higher corruption, spillovers on informal tax bases, or reduced trust of institutions. The impacts, however, do not reveal why local collection performs better than centralized collection or how local collection generates higher tax compliance on its own.

In this section, we discuss potential channels for the impacts across treatment arms, including lower transaction costs of collection, the informational advantages of local collectors,

tax morale explanations, and differences in sanctioning power.

7.2.1 Transaction Costs of Collection

Because collection happens door-to-door within neighborhoods in each treatment arm, if it requires less effort for local collectors to make collection visits to households than centralized collectors, this imbalance in the transaction costs of collection may account for the higher effectiveness of local collection. Chiefs typically live in the area in which they are charged with collection, whereas centralized collectors are dispatched from the center of the city, often to neighborhoods requiring as much as a 25 minute ride by motorcycle[13], and rarely collect in their own neighborhoods. Local chiefs may therefore have a greater ability to visit a larger share of households within a neighborhood and to make repeat visits. Additionally, they may be better able to time their visits to when property owners are at home — e.g., early morning, late evening — while centralized agents may be unable to work during such hours given other obligations at home. Repeated visits could increase compliance by, first, increasing the chances that liquidity constraints on payment do not bind: if households do not pay because they are unable to at the time of the visit, the chief's ability to revisit later on increases the likelihood that he or she is able to catch the property owner at a time when they have sufficient cash on hand. Second, repeat visits may enhance the perception of property owners that payment is necessary — e.g., if the chief returns multiple times to a household despite a property owner's refusal to pay during the first visit, the owner may perceive that the obligation is unavoidable.

To examine this channel we measure differences in visits by collectors, as reported by citizens during the midline monitoring survey, and measure differences in visit likelihood across treatments along extensive and intensive margins. Table 7 displays the impacts of the treatments on visits by collectors. Columns 1— 3 show impacts on whether a household reports being visited at all by a collector, after the census visit in which all households are visited. Columns 4— 6 show impacts on the number of visits by collectors post-census, including those who report no visits. Visit impacts are broken up by house type in columns 2, 3, 5, and 6. In treatment areas (relative to control) 42 to 48% of households in the pooled sample report being visited by collectors post-census. However, we detect no statistically significant difference between Central and Local on the extensive nor intensive margin of visits with a high degree of precision — the p-values on tests for inequality are 0.434 and 0.954, respectively[14].

[13] Agents in the Central arm are given "transport" — a stipend calibrated to the cost of hiring a motorcycle taxi to reach a specific neighborhood — on a weekly basis to fund their visits to neighborhoods.

[14] We discuss the lower visit rate of Central Plus Local Info in Section X.

TABLE 7: IMPACT ON VISITS TO TAXPAYERS

	Visited (Citizen-Reported)			Number of Visits (Citizen-Reported)		
	Pooled	Periphery	Midrange	Pooled	Periphery	Midrange
	(1)	(2)	(3)	(4)	(5)	(6)
Central	0.317***	0.297***	0.450***	0.474***	0.448***	0.673***
	(0.038)	(0.041)	(0.073)	(0.063)	(0.065)	(0.127)
Local	0.296***	0.279***	0.357***	0.471***	0.442***	0.568***
	(0.035)	(0.039)	(0.061)	(0.062)	(0.064)	(0.110)
Central + Info	0.259***	0.237***	0.364***	0.389***	0.356***	0.515***
	(0.035)	(0.040)	(0.058)	(0.057)	(0.060)	(0.105)
Central X Local	0.293***	0.265***	0.468***	0.478***	0.433***	0.750***
	(0.044)	(0.049)	(0.070)	(0.082)	(0.085)	(0.144)
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
House Type FE	Yes	No	No	Yes	No	No
Polygons	356	356	356	356	356	356
Observations	26,197	23,264	2,933	26,179	23,252	2,927
Control Mean	0.162	0.17	0.121	0.186	0.196	0.138
Central vs. Local	0.434	0.505	0.073	0.954	0.904	0.231
Central vs. CLI	0.05	0.046	0.091	0.069	0.061	0.051
Central vs. CXL	0.521	0.402	0.779	0.955	0.816	0.477
Local vs. CLI	0.141	0.109	0.874	0.058	0.057	0.456
Local vs. CXL	0.932	0.676	0.044	0.914	0.873	0.07
Joint Sig.	0.248	0.226	0.092	0.162	0.176	0.082

Notes: This table reports estimates from equation (1), regressing citizen-reported measures of collector visits at the individual property owner level on indicators for the treatment interventions assigned at the neighborhood level. The excluded category is the control group. We include fixed effects for randomization strata and cluster standard errors at the neighborhood level. Columns 1 and 4 include house type fixed effects, while columns 2 and 5 report estimates for periphery households only, and columns 3 and 6 report estimates for midrange households only. Columns 1–3 report impacts on whether households report being visited. Columns 4–6 report impacts on number of reported visits. The sample is all households visited in the midline monitoring survey. The bottom panel reports the p-values from tests for equality of equality of coefficients.

Our measure of visits is the primary evidence we have on collector effort. As we cannot determine the timing of visits, we are unable to assess whether chiefs are better able to optimally time their collection visits, reflecting a aspect of transaction costs we are unable to capture.

7.2.2 Informational Advantage

Conditional on collectors exerting similar levels of effort, local chiefs may possess better information about property owners regarding their likelihood of compliance. As the majority of households do not pay the tax, chiefs may have an informational advantage in identifying individuals in their community who have high willingness and ability to pay. They may also be better able to time collection visits around periods when households have cash-on-hand:

for example, if the chief knows when a person in his neighborhood receives his salary, he or she can time the visit to that households just after the receipt of salary, whereas the centralized agent cannot take advantage of this information.

To examine this explanation, we design the Central Plus Local Information treatment arm described in Section 4.1. In this treatment, Central collectors consult post-census with neighborhood chiefs to collect information about the ability and willingness of individual property owners to pay the tax. The Central collectors then take this information during their collection visits in the form of notes within their property register. The treatment is intended to transfer the information of chiefs to the centralized agents to observe, first, whether information has an impact on collection, and, second, whether the transfer of information can account for the gap in performance between Central and Local.

First, we verify that the information provided by the chief is useful. Table 8 displays that households rated by the chief as having higher "ease of payment" or "willingness to pay" are more likely to be visited by collectors post-consult, even controlling for observable characteristics of households, which centralized collectors may use in determining which households to visit in the absence of additional information. In increase of one point in the rating of ease or willingness of payment corresponds to between a 4 to 5 percentage point increase in the likelihood that a household is visited, suggesting that the information provided by the chief lead centralized collectors to target the households identified as having a higher likelihood of compliance.

TABLE 8: PREDICTIVENESS OF INFORMATION — VISITED

	Visited (Citizen-Reported)				
	(1)	(2)	(3)	(4)	(5)
Consultation Variables					
Ease of Payment	0.047**	0.042**			0.025
	(0.016)	(0.018)			(0.022)
Willingness to Pay			0.049**	0.048**	0.035
			(0.021)	(0.021)	(0.025)
Observable House Characteristics					
Roof Quality		0.007		0.007	0.005
		(0.012)		(0.016)	(0.016)
Wall Quality		0.008		-0.001	0.000
		(0.014)		(0.016)	(0.016)
Ravine Threat		0.018		0.008	0.007
		(0.026)		(0.027)	(0.028)
Strata FE	No	No	No	No	
House Type FE	Yes	Yes	Yes	Yes	
Polygons	80	80	80	80	80
Observations	5,065	4,096	3,432	3,422	3,384

Notes: This table reports estimates from a specification regressing an indicator for a household reporting being visited in the midline monitoring survey on variables provided by chiefs during the consultation process for the Central Plus Local Info treatment arm. Controls for observable households characteristics, drawn from the census survey, are included in columns 2, 4, and 5. All regressions include house type fixed effects and cluster standard errors at the neighborhood level. The sample is restricted to neighborhoods within the Central Plus Local Info arm and includes only households visited during midline monitoring.

However, that the chief's information is predictive of visits may mechanically reflect centralized agents simply following the chief's advice. If we observe higher payment at households rated as having higher ease or willingness of payment, this correlation may be endogenous to the targeted effort of collectors. To account for this potential endogeneity, Table 9 displays the predictiveness of the chief's information for payments, controlling for whether a households was visited. We see that, conditional on visits, the information provided by the chief is predictive: a one point increase in the rating of ease or willingness of payment corresponds to a 3 to 4 percentage point increase in the likelihood of payment. Comparing this relationship to the low average level of compliance, the chief's information could account for a large jump in the probability of payment.

TABLE 9: PREDICTIVENESS OF INFORMATION — TAX PAYMENT

	Paid Tax (Receipt Data)				
	(1)	(2)	(3)	(4)	(5)
Consultation Variables					
Ease of Payment	0.044***	0.042***			0.034***
	(0.009)	(0.009)			(0.010)
Willingness to Pay			0.035***	0.034***	0.015*
			(0.009)	(0.009)	(0.009)
Observable House Characteristics					
Roof Quality		-0.001		-0.001	-0.003
		(0.006)		(0.008)	(0.008)
Wall Quality		0.028		0.031	0.028
		(0.017)		(0.020)	(0.020)
Ravine Threat		-0.007		-0.005	-0.005
		(0.011)		(0.012)	(0.012)
Visited	0.097***	0.083***	0.080***	0.080***	0.080***
	(0.013)	(0.012)	(0.012)	(0.013)	(0.013)
Strata FE	No	No	No	No	No
House Type FE	Yes	Yes	Yes	Yes	Yes
Polygons	80	80	80	80	80
Observations	5,065	4,096	3,432	3,422	3,384

Notes: This table reports estimates from a specification regressing an indicator for a household paying the tax, drawn from administrative receipts, on variables provided by chiefs during the consultation process for the Central Plus Local Info treatment arm. Controls for observable households characteristics, drawn from the census survey, are included in columns 2, 4, and 5. All regressions include an indicator for whether a households reports being visited in midline monitoring. All regressions include house type fixed effects and cluster standard errors at the neighborhood level. The sample is restricted to neighborhoods within the Central Plus Local Info arm and includes only households visited during midline monitoring.

Having established the information provided by the chief during consultation is predictive of tax payment, we then examine the performance of centralized collectors in the Central Plus Local Information arm. Table 4 shows that collection in this arms performs no better than collection in Central with a high degree of precision (p-value for the test for equality of coefficients in 0.927), but is statistically distinguishable from Local collection at the 1% level. The transfer of information does not raise the level of collection relative to collection absent information by centralized collectors.

However, Table 7 shows that agents in Central Plus Local Information visit approximately 17% fewer households than agents in the Central arm, a difference we can detect at the 5% level. This change in collection habits, along with the evidence suggesting that Central Plus Local Information agents target households identified by the chief, indicates that the information changes collection patterns. Therefore, we interpret these results as demonstrating

that chiefs possess an informational advantage in collection, that transferring information has an effect on centralized collection, but that other considerations constrain the capacity of information to raise the level of centralized collection to be on par with local collection by chiefs.

Explanations for why the level of collection is so similar to Central collection, despite the apparent usefulness of information, may include income-targeting by centralized agents — if agents wish only to achieve some level of collection before completing a neighborhood, they may stop once they reach a certain limit of payments — or negative aspects of information — e.g., if chief's rate households as unwilling to pay though the owner may be willing to pay if visited by an agent of the central government — that distorts the effort of centralized collectors away from some aspects of their normal strategy that are effective.

7.2.3 Sanctioning Power

We next explore the explanation that chiefs may possess greater sanctioning power than Central agents. Chiefs may have local means of punishing property owners for non-compliance, ranging from manipulating demands for informal taxes, withholding of services — including resolution of disputes, representation to provincial government officials — and favor, or social ostracism. On the other hand, Central collectors may more credibly wield a threat of penalty for non-compliance or the ability to wrangle police or courts to force individuals to pay, given that they are viewed as more closely linked to the provincial government authority. For sanctioning power to drive the difference in collection outcomes across the Local and Central arms, we should observe that individuals in Local collection neighborhoods report higher perceived threat of punishment for non-compliance along at least one of the above-mentioned dimensions.

We examine sanctioning perceptions collected during the endline survey. This survey will ultimately include as many as 4,300 households (the upper sample limit assuming no attrition from the baseline sample), but at the time of writing is only approximately 5% complete. We report outcomes on this limited sample as they already appear sufficiently informative, with the caveat that data collection is ongoing.

Table 10 displays impacts on perceptions of punishment and acceptability of non-payment as reported by property owners surveyed at endline. The regression compares only the Local and Central arms (the Central arm is the excluded group) as there are insufficient observations in the alternative arms at this stage of the survey[15]. Columns 1-3 show citizen-reported likelihood of punishment, in general (column 1), by the provincial government (column 2), and by a property owner's local chief (column 3). The general likelihood outcome is measured on a 1— 4 Likert scale. The punishment by provincial government and chief outcomes

[15]House fixed effects are also not included because of limited sample in each house type classification.

are dummy variables constructed from a question asking respondents to identify the authorities most likely to punish a household for not paying the property tax. Property owners in the Central arm report that punishment for non-payment is a little to somewhat likely, and 62% believe that the provincial government is likely to punish households for non-payment, while only 54% believe chiefs are likely to punish[16]. For each measure, property owners in Local collection areas report lower likelihoods of punishment. The differences are not statistically significant, but the fact that the levels all move in the same direction suggests that citizens in Local neighborhoods do not appear to perceive higher likelihoods of sanctions compared to Central neighborhoods.

Columns 4-6 report the acceptability of non-payment: general acceptability (column 4), acceptability if a property owner does not possess sufficient cash to pay (column 5), and how ashamed a property owner would feel if they were not able to pay the tax (column 6), measured on 1-4 Likert scales. These questions are solicited as hypotheticals, asking property owners to consider a hypothetical neighbor in each situation. In Local areas, property owners report higher acceptability of non-payment, with the difference for the "No Cash" group being marginally significant from the level in Central. Property owners in Local also report lower levels of shame for inability to pay.

TABLE 10: PUNISHMENT PERCEPTIONS

	Punishment for Non-Payment			Acceptability of Non-Payment		
	Likelihood	Govt. Punish	Chief Punish	General	No Cash	Shame
	(1)	(2)	(3)	(4)	(5)	(6)
Local	-0.116	-0.067	-0.048	0.104	0.317*	-0.204
	(0.254)	(0.116)	(0.109)	(0.095)	(0.168)	(0.231)
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
House Type FE	No	No	No	No	No	No
Polygons	87	87	87	87	87	87
Observations	144	135	135	143	143	144
Central Mean	2.224	0.619	0.54	2.727	2.197	2.448

Notes: This table reports estimates from a version of equation (1), regressing measures of punishment perceptions on an indicator for the Local treatment arm assigned at the neighborhood level. The excluded category is the Central collection arm. We include fixed effects for randomization strata and cluster standard errors at the neighborhood level. The measures of punishment likelihood for non-payment is rated by property owners on a 1–4 Likert scale. The likelihood of punishment by the provincial government or neighborhood chief is an indicator for a property owner rating the entity as likely to punish a non-payer. Acceptability of non-payment measures are measured on a 1–4 Likert scale for acceptability, and the shame measure is a 1–4 Likert scale of how ashamed an individual would feel if they did not have sufficient funds to pay the tax. The sample is all households visited in the endline monitoring survey in the Central and Local arms.

[16]Note: citizens can interpret this question as "conditional on some entity imposing a punishment, what is the likelihood that it would be a particular entity", rather than "how likely is it that a particular entity will punish a household for non-compliance." This interpretation may reconcile the the high perceived level of punishment by provincial government and chiefs with the overall low level of compliance with the tax.

Taken together, these results, though preliminary, suggest that chiefs do not wield greater sanctioning power in enforcing tax obligations that centralized collectors. If anything, it appears perceptions of punishments for non-payments are lower in areas where chiefs collected taxes. As we collect more endline data we will reassess these differences to determine whether these differences are statistically distinct.

7.2.4 Stimulating Tax Morale

Finally we examine the tax morale channel. Chiefs may be better able to stimulate tax morale because they are more trusted by citizens given their familiarity with the community. Because chiefs provide local public goods (through *salongo*) and services such as conflict resolution and representation to higher levels of governments, citzens may feel a stronger reciprocal relationship with the chief than agents from the central tax ministry, in the sense that they pay taxes in order to receive public goods and services from the state (Luttmer and Singhal, 2014).

Table 11 displays impacts on property owners' beliefs about the use of tax revenues, again drawn from the limited endline sample available at present. Columns 1-3 ask respondents to consider out of $1,000 USD collected during the property tax campaign, how much would be stolen by a specific agent. Each question is posed separately, so agents are not stealing out of the same $1,000. The levels of stealing are high — between 44 to 61% in the Central arm. In each case, property owners in Local neighborhoods report that less will be stolen by tax collectors, officials of the provincial government, or their local neighborhood chief. For funds stolen by the chief, the difference is already statistically significant at the 5% level.

Columns 4 and 5 show impacts on outcomes related to spending on public goods, to examine the channel that chiefs engender greater reciprocity with citizens. Column 4 shows that property owners in Local neighborhoods believe more of the revenues collected during the campaign will be spend on infrastructure, compared to those in Central neighborhoods[17]. The measure in Column 5 asks property owners to predict the length of a road built with the funds collected during the tax campaign, where increasing values represent longer roads. Here we observe a much smaller difference between Local and Central arms.

[17]The proportion spent on infrastructure is measured on a 1-4 Likert scale.

TABLE 11: BELIEFS ABOUT USE OF TAX REVENUES

	Amount of Tax Revenue Stolen by Agent (out of $1,000 USD)			Spending on Public Goods from Tax Revenue	
	Collectors	Prov. Govt.	Chief	Prop. Spent Infra.	Road Length
	(1)	(2)	(3)	(4)	(5)
Local	-117.770	-106.896	-243.375**	0.545	0.016
	(81.652)	(70.094)	(106.709)	(0.404)	(0.582)
Strata FE	Yes	Yes	Yes	Yes	Yes
House Type FE	No	No	No	No	No
Polygons	87	87	87	87	87
Observations	144	144	115	54	144
Central Mean	440.299	610.597	561.316	0.692	3.97

Notes: This table reports estimates from a version of equation (1), regressing measures of beliefs about use of revenues on an indicator for the Local treatment arm assigned at the neighborhood level. The excluded category is the Central collection arm. We include fixed effects for randomization strata and cluster standard errors at the neighborhood level. The measures of stolen revenues are in US dollars. The proportion of revenues spent on public goods is measured on a 1–4 Likert scale, and the road length measure is a categorical variable increasing the length of the road. The sample is all households visited in the endline monitoring survey in the Central and Local arms.

7.3 Combined Team — Central X Local

We have ignored the combined team — Central X Local, in which a centralized agent is paired in collection with a local chief — for two reasons. First, the combined team potentially merges many advantages (and disadvantages) of each collection method, it is difficult ex ante to determine which channels may make this arm more or less effective than others. The lack of theoretical motivation for this arm is in contrast to its policy relevance. In the design stage, we expected that Central X Local would be the most effective treatment, as it performed best in piloting and, as a package, could allow centralized and local collectors to fuse their strengths. Second, in reality, the combined team performs the worst of all treatment arms, though Table 4 shows that it is not statistically different from the Central arm in impacts on tax payments.

We are in the process of collecting qualitative information from collectors at endline regarding the implementation of this arm. During the campaign, we received anecdotal reports that there were coordination problems and conflicts between team members that may have disrupted the efficiency of collection.

7.4 Cost-Effectiveness

The Local arm is the most cost-effective treatment. This fact derives from the higher level of collections in Local combined with the lower cost of collection — the key difference being that local chiefs are not paid transport as part of the collection process, whereas Central collectors are given a weekly stipend to travel by motorcycle taxi to neighborhoods, in addition to their collection bonus (which is also paid to Local agents). The Central arm breaks approximately even, whereas Local collection brings in a surplus. We do not report cost-effectiveness measures at this time as the disaggregated details of these measures are still being digitized.

8 Conclusion

This paper reports experimental evidence on the classic tradeoff between central and local tax collection in the context of a property tax campaign in a low-compliance, low-capacity setting. We find that local collection outperforms centralized collection, generating a level of tax compliance that is 36% higher. The prevailing level of collection remains low, but door-to-door collection raises compliance by more than 76 times the status quo level, with no estimated impacts across treatments on measures of corruption and trust of the state.

We find no evidence that lower transaction costs of collection or greater sanctioning power allow chiefs to do more collection. However, we find suggestive evidence that chiefs possess informational advantages in tax collection that, when shared, change the collection strategies of centralized agents, but do not make them on net more effective than collecting absent such information. Preliminary results from endline data collection indicate that local chiefs possess greater ability to motivate tax morale among citizen taxpayers within their domain, compared to collectors from the central tax ministry.

These findings highlight the importance of tax morale channels in generating compliance in settings where compliance and the capacity of the state to provide public goods and services are extremely low. Employing trusted actors such as local chiefs in the act of revenue collection may be an effective strategy both to raise much-needed revenues and to initiate a virtuous cycle of tax compliance and state capacity.

References

ACEMOGLU, D. (2005): "Politics and Economics in Weak and Strong States," *Journal of Monetary Economics*, 52(7), 1199–1226.

ACEMOGLU, D., S. NAIDU, P. RESTREPO, AND J. ROBINSON (2013): "Democracy, Redistribution and Inequality," Discussion paper, National Bureau of Economic Research.

ALATAS, V., A. BANERJEE, R. HANNA, B. A. OLKEN, AND J. TOBIAS (2012): "Targeting the poor: evidence from a field experiment in Indonesia," *American Economic Review*, 102(4), 1206–40.

ALLINGHAM, M., AND A. SANDMO (1972): "Income Tax Evasion: A Theoretical Analysis," *Journal of Public Economics*, 1(3-4), 323–338.

ALM, J. (1999): "Tax Compliance and Administration," *Public Administration and Public Policy*, 72, 741–768.

ARDANAZ, M., M. LEIRAS, AND M. TOMMASI (2014): "The Politics of Federalism in Argentina and its Implications for Governance and Accountability," *World Development*, 53, 26–45.

AZABOU, M., AND J. B. NUGENT (1988): "Contractual Choice in Tax Collection Activities: Some Implications of the Experience with Tax Farming," *Journal of Institutional and Theoretical Economics*, pp. 684–705.

BALDWIN, K. (2015): *The Paradox of Traditional Chiefs in Democratic Africa*. Cambridge University Press.

BARDHAN, P. (2002): "Decentralization of Governance and Development," *Journal of Economic Perspectives*, 16(4), 185–205.

BESLEY, T., AND T. PERSSON (2009): "The Origins of State Capacity: Property Rights, Taxation and Politics," *American Economic Review*, 99(4), 1218–1244.

——— (2011): *Pillars of Prosperity: The Political Economics of Development Clusters*. Princeton University Press.

BINZEL, C., E. FIELD, AND R. PANDE (2013): "Does the Arrival of a Formal Financial Institution alter Informal Sharing Arrangements? Experimental Evidence from Village India," Discussion paper, Working Paper.

BLUMENTHAL, M., C. CHRISTIAN, J. SLEMROD, AND M. G. SMITH (2001): "Do Normative Appeals Affect Tax Compliance? Evidence From a Controlled Experiment in Minnesota," *National Tax Journal*, pp. 125–138.

BRAUTIGAM, D., O.-H. FJELDSTAD, AND M. MOORE (2008): *Taxation and State-Building in Developing Countries: Capacity and Consent*. Cambridge University Press.

CARRILLO, P., D. POMERANZ, AND M. SINGHAL (2017): "Dodging the Taxman: Firm Misreporting and Limits to Tax Enforcement," *American Economic Journal: Applied Economics*, 9(2), 144–164.

CHEEMA, A., A. I. KHWAJA, AND A. QADIR (2006): "Local Government Reforms in Pakistan: Context, Content and Causes," *Decentralization and Local Governance in Developing Countries: A Comparative Pserspective*, pp. 257–84.

DINCECCO, M., AND G. KATZ (2016): "State Capacity and Long-run Economic Performance," *The Economic Journal*, 126(590), 189–218.

DRAGO, F., F. MENGEL, AND C. TRAXLER (2015): "Compliance Behavior in Networks: Evidence from a Field Experiment," Discussion paper.

FJELDSTAD, O.-H., AND J. SEMBOJA (2001): "Why People Pay Taxes: The Case of the Development Levy in Tanzania," *World Development*, 29(12), 2059–2074.

FREY, B., AND B. TORGLER (2007): "Tax Morale and Conditional Cooperation," *Journal of Comparative Economics*, 35(1), 136–159.

FUKUYAMA, F. (2011): *The Origins of Political Order: From Prehuman Times to the French Revolution*. Farrar, Straus and Giroux.

HALLSWORTH, M., J. A. LIST, R. D. METCALFE, AND I. VLAEV (2017): "The Behavioralist as Tax Collector: Using Natural Field Experiments to Enhance Tax Compliance," *Journal of Public Economics*, 148, 14–31.

HENN, S., L. PALER, W. PRICHARD, C. SAMII, AND R. S. DE LA SIERRA (2017): "On the Mechanics of Kleptocratic States," *Pre-Analysis Plan*.

HONIG, L. (2017): "Selecting the State or Choosing the Chief? The Political Determinants of Smallholder Land Titling," *World Development*, 100, 94–107.

JIBAO, S. S., W. PRICHARD, AND V. VAN DEN BOOGAARD (2017): "Informal Taxation in Post-Conflict Sierra Leone: Taxpayers' Experiences and Perceptions," .

KALDOR, N. (1965): "The Role of Taxation in Economic Development," in *Problems in Economic Development*, pp. 170–195. Springer.

KASARA, K. (2007): "Tax Me If You Can: Ethnic Geography, Democracy, and the Taxation of Agriculture in Africa," *American Political Science Review*, 101(1), 159–172.

KHAN, A. Q., A. I. KHWAJA, AND B. A. OLKEN (2015): "Tax Farming Redux: Experimental Evidence on Performance Pay for Tax Collectors," *The Quarterly Journal of Economics*, 131(1), 219–271.

KISER, E. (1994): "Markets and Hierarchies in Early Modern Tax Systems: A Principal-Agent Analysis," *Politics & Society*, 22(3), 284–315.

KISER, E., AND S. KARCESKI (2017): "Political Economy of Taxation," *Annual Review of Political Science*, 20, 75–92.

KLEVEN, H. J., M. B. KNUDSEN, C. T. KREINER, S. PEDERSEN, AND E. SAEZ (2011): "Unwilling or Unable to Cheat? Evidence From a Tax Audit Experiment in Denmark," *Econometrica*, 79(3), 651–692.

LEVI, M. (1988): *Of Rule and Revenue*. University of California Press.

LIESBET, H., AND M. GARY (2003): "Unraveling the Central State, But How? Types of Multi-Level Governance," *American Political Science Review*, 97(2), 233–243.

LUND, C. (2006): "Twilight Institutions: Public Authority and Local Politics in Africa," *Development and Change*, 37(4), 685–705.

LUST, E., AND L. RAKNER (2018): "The Other Side of Taxation: Extraction and Social Institutions in the Developing World," *Annual Review of Political Science*, 21, 277–294.

LUTTMER, E., AND M. SINGHAL (2014): "Tax Morale," *The Journal of Economic Perspectives*, 28(4), 149–168.

MOORE, M., W. PRICHARD, O.-H. FJELDSTAD, ET AL. (2018): "Taxing Africa," *University of Chicago Press Economics Books*.

OATES, W. E. (1999): "An Essay on Fiscal Federalism," *Journal of Economic Literature*, 37(3), 1120–1149.

OLKEN, B. A., AND M. SINGHAL (2011): "Informal taxation," *American Economic Journal: Applied Economics*, 3(4), 1–28.

PEREZ-TRUGLIA, R., AND U. TROIANO (2015): "Shaming Tax Delinquents: Theory and Evidence from a Field Experiment in the United States," Discussion paper, National Bureau of Economic Research.

POMERANZ, D. (2015): "No Taxation Without Information: Deterrence and Self-Enforcement in the Value Added Tax," *The American Economic Review*, 105(8), 2539–2569.

PRICHARD, W. (2015): *Taxation, responsiveness and accountability in Sub-Saharan Africa: the dynamics of tax bargaining*. Cambridge University Press.

RODDEN, J. (2006): *Hamilton's Paradox: The Promise and Peril of Fiscal Federalism*. Cambridge University Press.

SCARTASCINI, C., AND L. CASTRO (2007): "Tax Compliance and Enforcement in the Pampas: Evidence from a Field Experiment," *Journal of Economic Behavior and Organization*, 115, 65–82.

STELLA, P. (1993): "Tax Farming: A Radical Solution for Developing Country Tax Problems?," *Staff Papers*, 40(1), 217–225.

TIEBOUT, C. M. (1956): "A Pure Theory of Local Expenditures," *Journal of Political Economy*, 64(5), 416–424.

TILLY, C. (1985): "War Making and State Making as Organized Crime," in *Bringing the State Back in*. Cambridge University Press.

TORGLER, B. (2002): "Speaking to Theorists and Searching for Facts: Tax Morale and Tax Compliance in Experiments," *Journal of Economic Surveys*, 16(5), 657–683.

TRAXLER, C. (2010): "Social Norms and Conditional Cooperative Taxpayers," *European Journal of Political Economy*, 26(1), 89–103.

TYLER, T. R. (2006): *Why People Obey the Law*. Princeton University Press.

WEIGEL, J. (2018a): "Building State and Citizen: How Tax Collection in Congo Engenders Citizen Engagement with the State," *Working Paper*.

——— (2018b): "The Taxman Cometh: A Virtuous Cycle of Compliance and State Legitimacy in the D.R. Congo," *Working Paper*.

WEINGAST, B. R. (1995): "The Economic Role of Political Institutions: Market-Preserving Federalism and Economic Development," *Journal of Law, Economics, & Organization*, pp. 1–31.