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Summary

Delegating tax collection to informal leaders could raise tax revenue but runs the risk of undermining the local accountability of those leaders. We investigate this trade-off by exploiting whether city chiefs in the Democratic Republic of the Congo (DRC) were randomly assigned to collect property taxes in 2018. To measure accountability, we study the other side of the social contract: the distribution of resources by chiefs in a government cash transfer programme in which they had discretion over the recipients of development aid. In line with the preferences of citizens, chiefs who collected taxes allocated more programme benefits to poorer households and thus made fewer inclusion and exclusion errors. They were no more or less likely to pocket benefits themselves or allocate them to their families. Across a range of measures, citizens appear to have updated their beliefs of chiefs who collected taxes. We provide evidence that collector chiefs allocated aid to poorer households because door-to-door tax collection created opportunities to learn which households were in greatest need. In contrast to concerns of 'decentralised despotism,' the paper thus finds evidence of a chief's accountability benefiting from delegating tax responsibilities to local leaders in low-capacity states.

Keywords: chiefs, taxation and accountability, political economy, targeting, fragile states

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Acronyms

AEA	American Economic Association
CMI	Chr. Michelsen Institute
DGRKAC	Direction Générale des Recettes du Kasaï-Central [Directorate General of Service and Portfolio Revenue]
DIVAS	Division Provincial des Affaires Sociales [Provincial Division of Social Affairs]
DRC	Democratic Republic of Congo
EDI	Economic Development and Institutions
ICTD	International Centre for Tax and Development
ODEKA	L'Organisation d'Etudes Economiques sur le Kasaï [Organisation of Economic Studies on Kasaï]
OLS	Ordinary Least Squares
PPP	Purchasing Power Parity
RIAC	Le Réseau independent anti-corruption Société Civile du Congo [Network for Transparency and Anti-corruption]
SOCICO	Société Civile du Congo [Civil Society of Congo]

1. Introduction

In settings of low state capacity, governments often delegate tax responsibilities to informal local leaders like chiefs. For example, across sub-Saharan Africa, local leaders work alongside the formal state to sensitise potential taxpayers, assess taxable assets, and collect taxes.[1] Moreover, recent evidence suggests that collaborating with local elites can help low-capacity states raise revenue (Balán *et al.* 2022). However, a longstanding concern is that such delegation could erode the local accountability of local leaders (Banerjee and Iyer 2005; Michalopoulos and Papaioannou 2020; Lowes and Montero 2021). This concern evokes Mamdani's (1996) famous argument that colonial efforts to collect taxes through chiefs – i.e. via indirect rule – sewed 'decentralised despotism' across Africa.

However, it is not obvious *ex ante* that delegating tax collection responsibilities to local leaders would undermine their accountability. Potential accountability costs include fuelling misalignment between the chief and the people; when chiefs receive compensation from the state for tax duties, they might become agents of the state, not the people (Mamdani 1996). That said, assuming tax responsibilities could also have beneficial effects on the accountability of local leaders. Firstly, involvement in taxation could provide leaders with new information about their constituents' preferences and thus create scope for enhanced accountability (Mookherjee 2006; Acemoglu *et al.* 2007). Secondly, assigning leaders new responsibilities could change their preferences, making them more public-spirited and responsive to their citizens (Prendergast 2007). Thirdly, involving local leaders in taxation could incite citizens to exert bottom-up pressure and hold their leaders accountable (Paler 2013; Prichard 2015; Weigel 2020).

This paper explores how collecting taxes for the formal state impacts the accountability of city chiefs in Kananga, DRC. City chiefs are informal leaders selected by local notables, and they are in charge of dispute resolution, local public good provision and the targeting of development programmes.[2] We exploit random variation in whether city chiefs or state agents were responsible for the 2018 property tax collection in the city of Kananga. In treated neighbourhoods, the resident city chief went door to door registering properties and demanding the annual property tax

[1] See, for example, Gottlieb, LeBas and Magat (2020) for information on the role of local leaders in sensitisation, Cogneau *et al.* (2020) for information on their role in assessment and Balán *et al.* (2022) for information on their role in collection.

[2] However, city chiefs are not customary chiefs, even if they share several characteristics. Additionally, they are a common institution across Francophone Africa (de Russel 1998; Boone 2003; de Sardan *et al.* 2009; Honig 2017; de Herdt and Titeca 2019) and often play a role in property taxation (Nguema 2005; Cogneau *et al.* 2020).

payment. In control neighbourhoods, state agents performed these duties (as they had in the past).[3] In all neighbourhoods, chiefs maintained their usual responsibilities, whether or not they collected taxes. As discussed in a companion paper (Balán *et al.* 2022), property tax compliance is low in Kananga –only 7.5 per cent of property owners paid this tax during the 2018 tax campaign – but chief collection raised tax compliance by 3.2 percentage points, increasing revenue by 44 per cent. Regardless of who collected the property tax, all revenue went to the provincial government. This tax campaign, therefore, generated random variation in whether chiefs are delegated tax collection responsibilities. This paper studies how collecting taxes for the formal state shaped the accountability of chiefs to their local neighbourhood.

To measure chiefs' accountability, we study the other side of the social contract: how these chiefs choose to distribute resources in the community. In addition to the theoretical appeal of examining how involving chiefs in the revenue side of the state impacts their responsibilities in the state's expenditure side, it is also common for informal leaders to help target transfers in developing countries (Alatas *et al.* 2012; Basurto, Dupas and Robinson 2020). To obtain objective measures, we study a government cash transfer programme implemented in 2019 in which chiefs had discretion over the recipients of development aid.[4] The programme, administered by the Provincial Division of Social Affairs (DIVAS), involved (1) identifying the poorest quintile of households in each neighbourhood and (2) selecting five cash transfer recipients among them during a public lottery. Beneficiaries received FC10,000, equivalent to one month of household income for this target population. Because chiefs are embedded in local neighbourhoods, the government asked them to distribute programme tickets to the poorest 20 per cent of households in their neighbourhood.[5] Thus, each chief had discretion over which households were potential beneficiaries of the cash transfer programme. Embedding a measurement strategy in this programme allows us to obtain real-world measures of chiefs' distribution and diversion of public resources intended to help poor households.

We find that collecting taxes causes chiefs to be more likely to target poor households with programme benefits, consistent with citizens' preferences. Specifically, in neighbourhoods where chiefs collected taxes, they were 6.5 percentage points (20 per cent) less likely to make errors of inclusion – giving a

[3] Chiefs did not play a role in formal property tax collection in Kananga before 2018.

[4] The one-year gap between tax collection and the cash transfer programme helps to ensure that any effects we find do not reflect short-term impacts of tax collection, such as being busy with these new responsibilities in addition to normal chief duties.

[5] Chiefs often play a role in targeting government subsidies and development aid due to their local information about the needs and potential marginal treatment effects of households (Basurto *et al.* 2020).

programme ticket to households in the top 80 per cent of the neighbourhood wealth distribution – or errors of exclusion – failing to give programme tickets to households in the bottom 20 per cent. The results are similar when we define errors using a pre-registered wealth index or using self-reported monthly income. The reduction of total errors primarily stems from a reduction in inclusion errors among the top two quintiles, corresponding with a reduction in exclusion errors in the bottom decile – i.e. a reallocation of programme tickets from the richest to the poorest. Citizens also perceived chiefs to have made a more pro-poor allocation of programme benefits in neighbourhoods where the chief collected taxes.

Consistent with interpreting this pro-poor allocation as reflecting greater chief accountability, the reduction in exclusion and inclusion errors is more pronounced in neighbourhoods where citizens preferred that the antipoverty programme target poor households (as opposed to targeting everyone equally or other allocations). Indeed, in neighbourhoods where the modal preference is for a fully egalitarian allocation of transfers – i.e. no targeting of poor households – collector chiefs do not target poor households more than non-collector chiefs.[6] However, in any neighbourhood where targeting poor households is the modal preference among citizens, we observe a significant reallocation of transfers from rich households to poor ones.

As is often the case when local agents have targeting responsibilities, the discretion enjoyed by chiefs creates scope for corruption and capture. Chiefs might have allocated programme tickets to family members or coethnics. They also could have pocketed programme monies outright. However, we find little evidence that tax collection impacted these local capture measures, which is at odds with the 'decentralised despotism' hypothesis. In fact, in neighbourhoods where chiefs collected taxes, citizens viewed the chief as less likely to target their family members (although the results are only marginally statistically significant).

We then examine how chiefs collecting taxes shaped citizens' perceptions of their local legitimacy. We estimate treatment effects on citizens' views of the chief after tax collection but before the cash transfer programme. When considering an index of citizens' self-reported trust in, and the chief's performance, integrity and importance, chief tax collection causes citizens to update their beliefs about chiefs by 0.126 standard deviations. There is no effect on citizen demand for the chief's services or the reported recent activity of the chief. So, why did tax collection cause city chiefs to allocate programme tickets to poorer households? We examine several potential mechanisms: collecting taxes might have (1) created opportunities for **learning** which households in the neighbourhood are in the greatest need and thus enabled

[6] There is suggestive evidence that collector chiefs in such egalitarian neighbourhoods distribute tickets more evenly across the wealth distribution.

chiefs to realise a more pro-poor allocation of development programme benefits; (2) changed chiefs' **preferences** over the optimal allocation of benefits among their constituents by making them more public-spirited and responsive to citizens; or (3) stimulated bottom-up **citizen pressure**, or the anticipation thereof, which might have spurred chiefs to realise a more pro-poor allocation of programme benefits in accordance with the constituents' preferences.

To test the learning mechanism, we use a quiz-like survey module administered after the property tax campaign but before the cash transfer programme. City chiefs were asked to provide the name, education level and occupation of a set of randomly selected property owners in the neighbourhood. We can validate chiefs' responses using detailed survey data about these same owners and thus score each chief's local knowledge level. Chiefs are considerably better informed about the residents in neighbourhoods where they collect taxes. Citizens also view chiefs as more informed where they collect taxes. Moreover, more knowledgeable chiefs were better at targeting antipoverty programme tickets. City chiefs thus appear to have learned about the needs of their community while collecting taxes and then used this information when allocating programme tickets, resulting in fewer exclusion and inclusion errors.

To test if collecting taxes might have changed chiefs' preferences, we examine (random) variation in whether chiefs collected taxes in all or only part of their jurisdiction. In 55 out of 110 neighbourhoods assigned to state collectors, the neighbourhood's resident chief collected taxes in another neighbourhood in their jurisdiction. If learning were the only mechanism, then chiefs would be more pro-poor **only** in the parts of their jurisdiction where they went door to door collecting taxes.[7] By contrast, if taxation made chiefs more public-spirited and responsive as leaders, they would likely be more pro-poor throughout their entire jurisdiction. The evidence aligns more closely with the former scenario; the effects on pro-poor targeting are concentrated primarily in the parts of chiefs' jurisdictions where they collected taxes.

As a further test, we conducted a cross-randomised mechanism experiment designed to nudge citizens to make demands of the chief and thus offer a measure of the chiefs' responsiveness to citizens' demands. In a random third of neighbourhoods, 20 per cent of households were randomly selected to receive flyers containing information about the cash transfer programme and encouraged to 'see the chief for more information'. Households that received such a flyer were about five percentage points more likely to ask the chief about the programme and eight

[7] Indeed, collector chiefs' improved performance on the information quiz concerns properties in the part of their jurisdiction where they collected taxes.

percentage points more likely to receive programme tickets. However, collector chiefs were not more responsive to such citizen demands than non-collector chiefs, nor were they more pro-poor in their allocation of programme benefits in neighbourhoods assigned to this *information* intervention. Both results are inconsistent with a mechanism in which tax collection made chiefs more public-spirited and responsive to their citizens. We also find no evidence that chiefs are more prosocial – measured as contributing their own resources to the antipoverty programme in the neighbourhood – where they collected taxes. Finally, we estimate treatment effects on survey questions measuring chiefs' self-reported sense of duty, scope of responsibility, and views of redistribution. There is little evidence that tax collection changed these preferences.

As a third test for a citizen pressure mechanism, we exploit another arm of the cross-randomised mechanism experiment, in which a random sample of households received information about the cash transfer programme plus an invitation to request a community audit of the chief.[8] A random third of neighbourhoods were selected for this *information + audit* intervention. The goal of this treatment was to externally increase the extent to which chiefs anticipated citizen monitoring over the allocation of programme benefits. Chief surveys reveal a meaningful first stage: chiefs in *information + audit* neighbourhoods were substantially more likely to anticipate citizen monitoring and a higher probability of community audit. The treatments thus generated the expected 'first stage' of citizen pressure. However, we find no evidence that collector chiefs were differentially pro-poor (or less corrupt) in the allocation of programme benefits in neighbourhoods assigned to this *information + audit* intervention. Anticipated citizen pressure thus does not appear to be the mechanism behind the more pro-poor distribution of tickets realised by collector chiefs.[9]

On net, the evidence is, therefore, most consistent with a learning mechanism: walking door to door in their neighbourhoods and asking citizens about their ability to pay taxes appears to have provided chiefs with better information about the economic needs of their constituents, which allowed them to better target development programme benefits to the poorest households in the neighbourhood.[10]

We contribute to three strands of literature. Firstly, to our knowledge, this project is

[8] These community monitoring meetings, conducted by a respected civil society organisation in Kananga, are a common approach seeking to promoting transparency and local accountability in Congo.

[9] We also rule out several other alternative explanations for the results, including the possibility that collecting taxes made chiefs more obedient to the formal state, improved their organisational skills or shifted their conception of 'need' from local perceptions of vulnerability toward observable economic conditions.

[10] This learning mechanism is thus in part a reflection of the in-person tax collection approach used by the government. This is a common approach in developing countries (Cogneau *et al.* 2020; Krause 2020; Okunogbe 2021), including many of those that involve chiefs in tax collection.

the first to examine the causal effect of integrating informal leaders into the formal state on those leaders' local accountability. Although governments often delegate tax responsibilities to local leaders in low-capacity states,[11] we are unaware of past evidence on the accountability effects of chief tax collection. In contrast to concerns of sewing 'decentralised despotism' (Mamdani 1996; Michalopoulos and Papaioannou 2020; Lowes and Montero 2021), we find that collecting taxes causes chiefs to distribute more antipoverty programme benefits to the poorest houses in their neighbourhoods and to be viewed more positively by local residents.

Secondly, we contribute to a growing literature on local leaders in the context of targeting subsidies and antipoverty programs. Alatas *et al.* (2019) find little evidence of capture of welfare programmes by informal local leaders in Indonesia, and Basurto *et al.* (2020) find that Malawian chiefs use their local information to target fertiliser subsidies to the most productive farmers. We build on this literature by providing experimental evidence of how integrating city chiefs into the formal state's revenue apparatus shapes their targeting of cash transfers. The policy experiment we study thus sheds light on the links between the crucial roles played by local leaders in both the revenue and the expenditure side of the state.

Thirdly, we contribute to the literature on taxation and accountability. A large literature argues that broad-based taxation induces more accountable governance by stimulating participation and demands among citizens for political representation and public goods spending (Schumpeter 1918; North and Weingast 1989; Ross 2004; Moore 2008; Paler 2013; Martin 2014; Prichard 2015; Weigel 2020). The standard narrative is that taxation fuels bottom-up pressure that leads governments to adopt assemblies and proto-democratic institutions. This paper provides evidence of a complementary effect of tax collection: rendering local leaders more accountable to their populations.[12] Finally, we contribute to work on the informational constraints facing politicians and bureaucrats. Past work reveals the importance of relaxing these constraints by providing information to bureaucrats (Dal Bó *et al.* 2021; Dodge *et al.* 2021) and politicians (Liaqat 2019; Casey, Kamara and Meriggi 2021). We extend this literature by highlighting the synergy between the information the state needs to collect taxes and the information it needs to allocate transfers.

[11] On local elites working with the tax authorities in Africa, see, for example, Mamdani (1996); Boone (2003); Iversen *et al.* (2006); Baldwin (2015); Sanchez de la Sierra (2020); Jibao, Prichard and van den Boogaard (2017); Gottlieb *et al.* (2020); Cogneau *et al.* (2020); and van den Boogaard (2021).

[12] This second effect is perhaps analogous to the 'short route of accountability' discussed by World Bank (2004), in which the agents of the state themselves become responsive to citizens. This stands in contrast to the 'long route of accountability' in which citizens demand more responsive service delivery by voting out bad politicians.

2. Setting

The DRC is Africa's fourth most populous country and one of the five poorest countries globally. The average monthly household income in Kananga, the capital of the Kasaï Central province and a city of 1.6 million, is about US$106 (PPP US$168). The DRC ranks 188 out of 200 countries in its tax-GDP ratio.[13] The tax revenue of the Provincial Government of Kasaï Central is similarly low, just shy of US$1 million per year. Perhaps unsurprisingly, public goods and services are also scarce and of low quality in Kananga. Only 5 per cent of households have access to running water, and only 14 per cent have any source of electricity. Similarly, only 9 per cent of the roads are paved, and less than 3 per cent of the streets occasionally benefit from municipal garbage collection. In sum, Kananga resembles the low state capacity, low fiscal capacity, low service provision trap noted by Besley and Persson (2009).

To increase tax revenue, the provincial government has recently adhered to international best practices for local revenue mobilisation (Franzsen and McCluskey 2017) and turned to property taxation.[14] Indeed, since 2016, it has conducted a series of citywide door-to-door property tax collection campaigns (Weigel 2020; Balán *et al.* 2022; Bergeron, Tourek and Weigel 2023b). The randomised policy experiment we study is embedded in the 2018 property tax campaign.

In Kananga and other urban areas in Francophone Africa, local order is preserved by informal leaders known as city chiefs. These chiefs are local elites whose responsibilities include helping mediate local disputes, maintaining local infrastructures through an informal labour tax called *salongo* and targeting development projects. They are nominated by elders in the neighbourhood and rubber-stamped by the city government officials.[15] They have indefinite and often lifelong tenure, which sometimes passes through families.[16] City chiefs do not receive regular salaries, and the main benefit of being a city chief is the status that comes with the position. City chiefs share many characteristics with customary chiefs – e.g. dispute resolution and local public goods provision – but are a distinct institution.

[13] Data available at World Bank (n.d.).

[14] This decision is consistent with advice from tax experts for a local government in a rapidly urbanising context in which increases in property values have not been matched with parallel increases in property tax revenue needed to fund urban infrastructure (Fjeldstad *et al.* 2017). Property taxes are widely considered underexploited in sub-Saharan Africa (Moore *et al.* 2018).

[15] Chiefs are thus accountable to the people in their jurisdiction and to the state. However, the rules by which they are selected and removed demonstrate that they are primarily accountable to the people living in their jurisdiction. Survey data reinforce this interpretation.

[16] About 19 per cent of city chiefs reported inheriting their position from a relative.

Urban chiefs frequently play a role in tax collection and in the allocation of subsidies.[17]

[17] Beyond conflict resolution, urban chiefs play many complementary roles *vis-à-vis* the formal state (Henn 2020). For example taxation, land titling, information campaigns or subsidy distribution in settings like Senegal, Cote d'Ivoire, Niger, Cameroon, DRC and elsewhere (de Russel 1998; Nguema 2005; de Sardan *et al.* 2009; de Herdt and Titeca 2019; Cogneau *et al.* 2020).

3. Design

To study how collecting taxes for the formal state impacts chiefs' accountability, we leverage random variation in whether city chiefs or state agents were responsible for tax collection during the 2018 property tax campaign in Kananga. Before describing the experimental design, we outline the key details and procedures of the tax campaign.[18]

3.1 2018 property tax campaign

3.1.1 Campaign stages

In every neighbourhood of the city, the campaign was conducted in two stages. Firstly, collectors went door to door to conduct a property register. As in many developing countries, the government lacked an up-to-date property valuation roll, so collectors had to create one in this first step. They assessed each property's tax liability based on the materials used in the construction of the main house. If the main house was built from non-durable materials, such as mudbricks, the property was assigned to the *low-value band* category (89 per cent of properties) and faced an annual official tax liability of FC3,000.[19] By contrast, if the main house was built with durable materials, such as bricks or concrete, the property was assigned to the *high-value band* category (11 per cent of properties) and faced an annual tax liability of FC13,200.[20] When registering properties, collectors assigned them a unique ID code and issued official tax notices informing the owner about the tax liability.

Secondly, after completing the property register, collectors returned to the households for follow-up tax collection visits. Collectors used their handheld receipt printers to issue receipts to taxpayers. Each transaction was recorded in the device's memory and downloaded to the government database weekly when they deposited

[18] For still greater detail, see Balán *et al.* (2022) and Bergeron *et al.* (2023b).

[19] Rather than facing a property tax schedule that applies tax rates to property value, the provincial government used a simplified tax instrument: a flat, fixed fee due once per year and determined by the principal's house's construction materials (a 'tag' to approximate property value). Such tax schemes are common in developing countries, including India, Tanzania, Sierra Leone, Liberia and Malawi (Franzsen and McCluskey 2017).

[20] In addition, the following type of properties were exempt: (1) state-owned properties; (2) churches, schools, scientific institutions and philanthropic institutions; (3) properties owned by the elderly (55 years old and above); and (4) properties with houses under construction.

the tax revenue.[21] Collectors had one month to complete the property register and tax collection in each assigned neighbourhood. Owners who did not pay the property tax by the end of the month, in theory, owed 250 per cent of the original liability and faced the possibility of a court summons, although enforcement of such penalties was rare among residential properties.

3.1.2 Randomisation

The government randomly assigned 221 neighbourhoods in Kananga to taxation by city chiefs (*Local*, 111 neighbourhoods) or taxation by state agents (*Central*, 110 neighbourhoods).[22] Collectors in both treatment arms received the same training, followed the same tax protocol, used the same technology (handheld receipt printers) and received the same compensation.[23] The only difference across neighbourhoods was the identity of the tax collectors. While in *Local*, city chiefs were charged with all campaign responsibilities, which they completed with their adjoint/assistant, in *Central*, state agents assumed these responsibilities (as they had in the past). State collectors were unsalaried contractors who frequently work for the tax ministry and other branches of the provincial government. They also worked in teams of two so that team size was constant across treatments.

3.2 2019 cash transfer programme

To obtain an objective, real-world measure of chief accountability after the tax campaign, we turn to the other side of the social contract and study a government cash transfer programme in which chiefs have discretion over the distribution of scarce public resources in their neighbourhood.

3.2.1 Division of Social Affairs

We study a programme administered by the Provincial Division of Social Affairs (Division des Affaires Sociales or DIVAS), whose mission it is to help vulnerable

[21] Collectors were required to account for discrepancies between the tax revenue and the receipt data (rare in practice).

[22] As described in Balán *et al.* (2022), there were 356 total neighbourhoods in the experiment. We only include in our analysis the 111 neighbourhoods assigned to Local tax collection and the 110 neighbourhoods assigned to Central tax collection. We do not include the neighbourhoods assigned to the hybrid *Central + Local Information* (80 neighbourhoods) or *CentralXLocal* (50 neighbourhoods) treatments. Similarly we omit from our analysis the five *Control* neighbourhoods. These additional treatment arms are described in detail in Section II.A of Balán *et al.* (2022).

[23] Collectors across all treatment arms received a piece-rate wage with two components. Firstly, they received FC30 per registered property. Secondly, they received a piece-rate compensation for tax collections equal to 25 per cent of the revenue deposited.

households in Kananga. These programmes typically involve providing financial or food assistance for individuals and households in extreme poverty or other types of need (e.g. disability).

3.2.2 Cash transfer programme

We study a cash transfer programme implemented by DIVAS in collaboration with the city chiefs in 2019 (on average eight months after the property tax campaign).[24] The programme had three key steps.

Firstly, city chiefs were tasked with the distribution of programme tickets to the poorest residents. They received programme tickets corresponding to approximately 20 per cent of the households in their neighbourhood,[25] and they had ten days to distribute them to the poorest quintile of residents.[26] Chiefs were allowed to give up to three tickets per household. When they issued a ticket, they gave half of the ticket slip to the head of the household and kept the other half, on which they wrote the head of the household's name, address and property ID. As in other settings (e.g. Basurto *et al.* 2020), the government delegates this task to chiefs because of their embeddedness in the local community.

Secondly, in the presence of the chief and other observers, DIVAS agents held a public lottery in each neighbourhood. During the lottery, five cash transfer recipients were randomly selected among those who had received tickets. Thirdly, and finally, the beneficiaries received the cash transfers. The chief and a DIVAS agent together distributed the cash transfer to the first two beneficiaries (in alphabetical order) to demonstrate the process. The city chief then delivered the remaining three cash transfers without being accompanied by a DIVAS agent.

3.3 Mechanism experiment

To help elucidate potential mechanisms behind a change in chiefs' allocation of programme tickets, we cross-randomised two neighbourhood-level interventions aimed at increasing citizen demands and accountability pressures before chiefs began distributing programme tickets.

[24] DIVAS has administered similar cash transfer programmes in the past. The main differences in the programme due to our involvement were (1) the use of unique property ID codes on programme tickets to enable more precise measurement and (2) the surveys we administered before and after the programme.

[25] There are, on average, about 130 properties in each neighbourhood. We use the terms 'household' and 'property' interchangeably in the rest of the paper.

[26] The exact instruction to chiefs was to allocate the tickets to the households in greatest economic need.

3.3.1 Information treatment

In the first sub-treatment arm (*Information*), before the programme ticket distribution, 20 per cent of households in a neighbourhood were randomly selected to receive information about the programme. During door-to-door visits, enumerators distributed flyers containing information about (1) the goal of the cash transfer programme, (2) the number of prize recipients in the neighbourhood, (3) the name of the chief responsible for distributing programme tickets and (4) the timeframe for ticket distribution (see Figure A1.1 for an example). The flyers also noted that citizens could 'see the chief for more information'. This treatment sought to generate random variation within and across neighbourhoods in whether citizens were informed about and prompted to engage with the chief regarding the cash transfer programme.[27] By making individual demands more likely, the *Information* arm aimed at testing whether collector chiefs were more responsive to citizens.

3.3.2 Information and audit treatment

A second sub-treatment arm (*Information & Audit*) sought to reduce the cost of citizen collective action and thus increase the chief's perceived probability of bottom-up monitoring and accountability pressure.[28] In these neighbourhoods, before programme ticket distribution, 20 per cent of households were randomly selected to receive the same information flyers as in the *Information* arm, plus an audit meeting request form. The audit form informed citizens that they could request a community audit to investigate the implementation of the cash transfer programme in the neighbourhood (see Figure A1.2 for an example).[29] Community monitoring meetings are common in the DRC and other developing countries in conjunction with development projects (see Olken 2007). The forms specified that the audit meetings would be conducted by the well-known and respected local civil society organisations, Le Réseau independent anti-corruption Société Civile du Congo (RIAC or the Network for Transparency and Anti-corruption), which specialises in promoting transparency and fighting corruption, and Société Civile du Congo (SOCICO or the Civil Society of Congo), which focuses on government accountability in the areas of violence, conflict and elections. Citizens

[27] Although many citizens likely had some knowledge about the programme, they were unlikely to know precisely who was responsible for distributing tickets and when distribution was scheduled to occur in a particular neighbourhood.

[28] We are grateful to Laura Paler for her helpful discussions that shaped these interventions. A companion paper explores the citizen-side of accountability in detail (Ahrenshop *et al.* 2023).

[29] Citizens could separately request audits of the chief or the DIVAS, the two key actors involved in the cash transfer programme. They received two different forms, and to request an audit they had to drop each form in a different drop box located in a different location in the city centre.

were informed that RIAC and SOCICO would organise audit meetings in the neighbourhoods that submitted the most audit request forms as a share of the neighbourhood population. Whether enough audit request forms were submitted to result in an audit meeting was not revealed to the chief until after the cash transfer recipients were selected by public lottery and received their transfer.[30] The *Information & Audit* arm aimed to increase chiefs' perceived probability of citizen monitoring to test if collecting taxes made chiefs more responsive to anticipated bottom-up pressure.

3.3.3 Control

The remaining arm is the *Control*, which received no additional interventions. These sub-treatments of the mechanism experiment were randomly assigned at the level of the *chief*, meaning all neighbourhoods within a chief's domain received the same intervention – *Information*, *Information & Audit* or *Control*.[31] Table A1.2 shows the experimental design.

3.4 Balance

Balán *et al.* (2022) provide evidence that the randomisation of chief taxation duties at the neighbourhood level achieved balance along a range of property owner and neighbourhood characteristics (see Tables 6.2.1, A1.2 and A1.3). We additionally assess balance for the key variables we will use to estimate household wealth (and thus the quality of chiefs' targeting of poor households). These include characteristics of properties – wall quality, roof quality, erosion threat and accessibility to the neighbourhood's main avenue – as well as asset ownership. Enumerators collected these variables during household surveys after the 2018 tax campaign, as described in Section 4.2. We do not find that any of these characteristics differ systematically by chief tax collection status (Table A1.4). We test the omnibus null hypothesis that the treatment effects for the variables are all zero using parametric F-tests for a bilateral treatment comparison and fail to reject the null ($F = 0.612, p = 0.767$). The mechanism experiment also achieved balance across property owner characteristics (Table A1.5, Panel A), property characteristics

[30] After the conclusion of the programme, RIAC and SOCICO conducted audit meetings in the ten neighbourhoods that submitted the greatest number of audit meeting request forms as a share of the population. The meetings brought together citizens, the chief and DIVAS representatives to discuss the cash transfer programme, including how the chief decided to whom to give programme tickets, who received programme tickets in practice, who won the cash transfer during the public lottery and whether the transfers were received by the households selected during the public lottery. See Ahrenshop et al. (2023) for more information.

[31] This design was intended to avoid direct spillovers within chiefs: e.g. a chief compensating for pressure in an *Information & Audit* neighbourhood within their domain by diverting corruption to a control neighbourhood.

(Table A1.5, Panel B), neighbourhood characteristics (Table A1.5, Panel C) and the property characteristics used to construct the wealth index (Table A1.6).[32]

[32] Table A1.5 examines the balance of the mechanism experiment using the same measures Balán *et al.* (2022) use to assess the balance of the original assignment of tax responsibilities. Of the 44 treatment comparisons using baseline characteristics, 4 (9.1 per cent) are significant at the 10 per cent significance level, as expected by chance under random assignment. Table A1.6 assesses balance using the household attributes collected in the household surveys described in Section 4. None of the treatment comparisons using these measures are statistically significant.

4. Data

We use administrative and survey data from the 2018 property tax campaign and the 2019 cash transfer program, summarised in Table A1.1.

4.1 Tax campaign data

Administrative data related to the 2018 property tax campaign contain neighbourhood-level information on assignment to tax collection by city chiefs (*Local*) or state agents (*Central*), as well as property-level information on registration and tax payment for all registered properties by unique tax IDs. Additionally, we collected detailed household survey data on property and owner characteristics before the tax campaign (baseline), immediately after the campaign (midline) and several months after the tax campaign but before the cash transfer programme (endline). Balán *et al.* (2022) describe these data sources in detail (Section III).

4.2 Cash transfer programme data

We have access to administrative data from DIVAS regarding the 4,401 households to which chiefs allocated programme tickets and the lists of lottery winners. We can link these records to survey data using the unique property IDs.

In addition, after programme ticket distribution concluded in each neighbourhood, enumerators administered surveys to 6,267 households in the Central and Local neighbourhoods, approximately 28 per neighbourhood. Enumerators visited all households allocated programme tickets, as well as ten randomly sampled households.[33] The survey asked questions about the cash transfer programme, chiefs and the provincial government.[34]

4.3 Key outcomes measurement

We follow the targeting literature (e.g. Alatas *et al.* 2012) and consider errors of exclusion and inclusion as our main outcomes. To define errors, we first use our household survey data to estimate the need for all households – akin to a proxy means test – and thus identify the poorest quintile. We follow our pre-analysis plan

[33] Due to overlap between the recipient sample and the random sample, as well as imperfect survey response rates, the total number of surveys per neighbourhood is less than 33 on average.

[34] A subset of on average 12 survey recipients were invited to complete a longer survey containing more detailed questions.

and use a wealth index composed of house characteristics, including the quality of the roof, walls, road, erosion and accessibility, in the main specification.[35] We pre-specified this index because it is composed of objective measures observed by enumerators that cannot be manipulated by respondents seeking to appear poorer than they are and thus be more likely to benefit from the cash transfer programme. To provide a more comprehensive picture of economic need, however, we also estimate errors using (1) a *wealth + assets* measure that also includes ownership of various household goods, vehicles and an electricity connection, and (2) self-reported income.

For each of these need measures, we rank households and identify the bottom 20 per cent of the population, who should have been the ones to receive the programme tickets. We then compare the actual recipients of programme tickets to identify *errors of exclusion* – households in the bottom 20 per cent who did not receive tickets – and *errors of inclusion* – households in the top 80 per cent who did receive tickets.[36]

There will, of course, be measurement error in our estimation of the bottom 20 per cent, which is one of the reasons why we consider three different definitions of economic need (wealth, wealth and assets and income). However, our goal is not to estimate targeting errors perfectly but instead to **compare** targeting errors across treatment arms. Because measurement errors should be consistent across treatment groups, comparing estimated targeting errors when chiefs did and did not collect taxes should provide an unbiased estimate of the effect of tax collection on chiefs' targeting of poor households.

We assess nepotism by comparing household characteristics and connections to the chief, measured in household surveys before the programme, among ticket recipients. Finally, we assess corruption by comparing households' reported receipt of

[35] The standardised index comprises the quality of the walls of structures on the property (whether walls were made of mudbrick vs cement and in good condition), the quality of the roof (whether roof is made of thatch, mat, bamboo or palm fronds vs concrete, tiles or sheet iron), whether a household compound is threatened by erosion, the quality of the road in front of the property and how accessible the compound is from the neighbourhood's main avenue. In Bergeron *et al.* (2023a) we show that these attributes are positively correlated with property values, households' primary asset of households in Kananga.

[36] When estimating errors of exclusion and inclusion by wealth, we weight observations by sampling weights that correspond to the ratio of the total number of households (according to administrative data) to the number of completed surveys in a neighbourhood. Given that they had different sampling probabilities, we construct sample weights separately for ticket recipients and non-recipients. By contrast, when assessing errors using the asset- or income-based measures, we do not apply sampling weights because the data for these measures is drawn from surveys conducted before the cash transfer programme, in which ticket recipients were not more likely to be sampled (see Balán *et al.* (2022) for details). The effects on errors of exclusion and exclusion by wealth we estimate are not sensitive to sample weighting (Tables A3.3 and A3.4), though the relative magnitudes, not surprisingly, differ.

programme funds with the list of winners from the DIVAS lotteries.

5. Estimation

We use ordinary least squares (OLS) to compare neighbourhoods in which local chiefs were responsible for tax collection to neighbourhoods in which local chiefs were not responsible for collection in the 2018 tax campaign:

$$y_{ijk} = \beta_0 + \beta \text{ChiefTaxed}_{jk} + \mathbf{X}_{ijk}\Gamma + \alpha_k + \varepsilon_{ijk} \quad (1)$$

where i indexes individuals, j neighbourhoods and k randomisation strata. Standard errors are clustered at the neighbourhood level. The term y_{ijk} is the outcome of interest, a_k are stratum fixed effects, and $\mathbf{X}_{ijk}$ is a covariate vector.[37] The $Chief\ Taxed_{jk}$ term is an indicator denoting neighbourhoods where chiefs were in charge of tax collection. This regression thus compares outcomes in *Local* compared to i, where state agents collected taxes.

In assessing mechanisms, we also examine heterogeneity by whether chiefs collected taxes in all or just part of their jurisdiction. This heterogeneity results from tax collection duties being randomly assigned to local chiefs at the neighbourhood level, but at times, chief jurisdictions spanned multiple neighbourhoods. Thus, in 55 of the 110 neighbourhoods assigned to state collectors, the resident chief collected taxes in another neighbourhood in their jurisdiction. In the other 55 neighbourhoods assigned to state collectors, the resident chief did not collect taxes anywhere in their jurisdiction. We illustrate these different cases in Figure A2.1. To compare how chiefs who collected *here* versus *elsewhere* differ in their allocation of programme tickets, we estimate the equation:

$$y_{ijk} = \beta_0 + \beta_1 \text{Chief TaxedHere}_{jk} + \beta_2 \text{Chief TaxedElsewhere}_{jk}$$

$$+ \mathbf{X}_{ijk}\Gamma + \alpha_k + \varepsilon_{ijk} \quad (2)$$

where the excluded category is neighbourhoods where state collectors worked and the local chief did not engage in the tax campaign anywhere. The $Chief\ TaxedHere_{jk}$ term is identical to the $Chief\ Taxed_{jk}$ term in Equation (1). The inclusion of the $Chief\ TaxedElsewhere_{jk}$ thus removes the set of state collector neighbourhoods with a resident chief who taxed elsewhere from the excluded

[37] In our preferred specification, we include no covariates – other than stratum fixed effects – as controls but include them in robustness checks.

category in Equation (1).[38]

When comparing outcomes across the cross-randomised interventions of the mechanism experiment, we use OLS to estimate a version of Equation (1), interacting the $Chief\ Taxed_{jk}$ indicator with indicators for the sub-treatment arms.[39] Because the sub- treatments were randomised at the chief level, we replace the randomisation strata used in estimating Equation (1) with coarser randomisation strata used for the mechanism experiment. These were defined by the geographical location of each neighbourhood in Kananga and average tax compliance during the 2018 tax campaign. Standard errors are again clustered at the neighbourhood level, and our preferred specification does not include covariates.

[38] In a few cases, chiefs retired meaning that a different chief taxed and distributed tickets in *Chief TaxedHere*$_{jK}$ neighbourhoods. If anything, such changes would bias our estimates to zero.

[39] Specifically, we estimate $y_{ijl} = \beta_0 + \beta_1 Chief\ Taxed_{jl} + \beta_2 Chief\ Taxed_{jl} * Info_{jl} + \beta_3 Info_{jl} + \beta_4 Chief\ Taxed_{jl} * Info\ \&\ Audit_{jl} + \beta_5 Info\ \&\ Audit_{jl} + \mathbf{X}_{ijl}\Gamma + \alpha_l + \varepsilon_{ijl}$, where all terms are defined analogously to those in Equation (1).

6. Results

6.1 Effects on targeting of cash transfers by wealth and income

Table 6.1.1 Effects of chief tax collection on targeting by wealth[40]

Analysis:		By wealth status		By wealth level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average wealth
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether the chief tax there								
Chief taxed here (*Local*)	-0.065***	-0.056***	-0.017**	-0.074**	-0.044	-0.011	-0.031**	-0.121
	(0.017)	(0.019)	(0.007)	(0.036)	(0.028)	(0.012)	(0.013)	(0.076)
R^2	0.031	0.072	0.006	0.217	0.084	0.019	0.024	0.157
Observations	6267	1000	5267	446	554	2444	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.317	0.898	0.163	0.897	0.899	0.159	0.166	0.065
Panel B Comparing neighbourhoods by whether chief taxed anywhere								
Chief taxed elsewhere (*Central*)	-0.022	-0.005	-0.011	0.023	-0.032	0.017	-0.040**	-0.089
	(0.025)	(0.020)	(0.011)	(0.038)	(0.035)	(0.017)	(0.020)	(0.114)
Chief taxed here (*Local*)	-0.077***	-0.058***	-0.023**	-0.064	-0.061*	-0.002	-0.052***	-0.168*
	(0.019)	(0.021)	(0.009)	(0.039)	(0.034)	(0.015)	(0.017)	(0.098)
R^2	0.031	0.072	0.006	0.217	0.085	0.020	0.025	0.158

[40] This table examines the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets. Specifically, Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (here), where the local chief did not collect taxes directly but collected taxes in another neighbourhood (elsewhere) and neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile, respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level.

Observations	6267	1000	5267	446	554	2444	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.328	0.897	0.169	0.891	0.903	0.157	0.181	0.041
p-value test: tax here vs elsewhere	0.016	0.016	0.202	0.050	0.350	0.183	0.468	0.396

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

We first compare the targeting of programme tickets according to the wealth index in neighbourhoods where chiefs did and did not collect taxes by estimating Equation (1). According to this measure of need, collecting taxes reduced total targeting errors from 31.7 per cent to 25.2 per cent, a difference of 6.5 percentage points (Table 6.1.1, Panel A, Column 1).[41] This reflects a reduction in exclusion errors of 5.6 percentage points (Column 2) and a reduction in inclusion errors by 1.7 percentage points (Column 3).[42] We find similar results when we re-estimate the analysis using an index of wealth and assets (Figure A3.1 and Table A3.1).[43] We also find similar results when re-estimating the analysis using self-reported income (Figure A3.1 and Table A3.2).

We also show the robustness of estimating the results using the underlying components of the wealth index (Table A3.5) and by including a neighbourhood leave-one-out mean when estimating the impacts of chief taxation on targeting by both wealth (Table A3.6) and income (Table A3.7). We estimate fully saturated models with dummies for cross- randomised treatment arms and their interactions with the chief taxation treatment (Tables A3.8 and A3.9), and we also include controls for chief characteristics (Tables A3.10 and A3.11). Finally, we implement a range of additional robustness checks in Tables A3.12 and A3.13, including adding controls for basic covariates and socioeconomic variables, re-estimating results by including neighbourhoods that were part of the taxation campaign pilot, excluding a neighbourhood misassigned to the treatment group after randomisation, and re-estimating results at the neighbourhood level after winsorizing the top 10 per cent of outcomes.

These estimated differences in error rates are large *vis-à-vis* the targeting literature. For example, Alatas *et al.* (2012) detect 2.9 to 3.1 percentage points higher error rates

[41] Table 6.1.1 summarises the results for the wealth index measure using sample-weighted data. Table A3.3 displays results using unweighted data.

[42] Because of how exclusion errors are defined – the share of households in the bottom 20 per cent that do not receive tickets – the error rates are high (e.g. 89.9 per cent in *Central*). This is true throughout the targeting literature. For instance, Alatas *et al.* (2016) reports that 84 per cent of the poorest households were excluded by the most successful targeting method they study in Indonesia (self-targeting through ordeals).

[43] Table A3.4 displays results using unweighted data.

for hybrid and community-driven targeting of cash transfer relative to a simple proxy means test in Indonesia. Basurto *et al.* (2020) estimate error rates that are 3.5 to 5.5 percentage points higher when chiefs allocate agricultural input subsidies to poor households compared to the allocation based on a proxy means test in rural Malawi.

To characterise how tax collection changed chiefs' distribution of programme tickets more precisely, we estimate errors in finer quantiles of the wealth distribution. Among poor households (bottom quintile of wealth), we define 'very poor' households as those belonging to the bottom decile and 'near poor' as those with wealth between the 10th and 20th percentile. Among non-poor households, we define 'middle' wealth households as those between the 20th and 60th percentile and 'rich' households as those above the 60th percentile.[44] Although the coefficients are always negative, this analysis reveals that collecting chiefs primarily made fewer errors of exclusion among the 'very poor' and fewer errors of inclusion among the 'rich' (Table 6.1.1, Panel A, Columns 4–7). These patterns are suggestive of a reallocation of programme tickets from the wealthiest households toward less wealthy households. This reduction in errors means that the average ticket recipient is 0.121 standard deviations less wealthy in neighbourhoods where chiefs collected taxes (Column 8), though the difference is not significant in this specification. Tests for equality of distributions confirm the presence of significant differences in the distribution of the wealth index across treatment groups, using both Kolmogorov-Smirnov and Wilcoxon rank sum tests (Table A3.14, Rows 1 and 5).[45]

[44] The share of total households in each wealth status category does not correspond perfectly to the percentile range because households are bunched on certain values of the wealth index measure. Therefore, there are small differences in the correspondence between the percentile thresholds for the wealth status categories in Columns 4–7 and the share of households each represents: e.g. the very poor category (bottom decile) includes 15 per cent of all households rather than 10 per cent (Table 6.1.1, Panel A, Column 1).

[45] Figure A3.2 displays the distributions of the wealth index by treatment (Panel A) and treatment and where chiefs directly taxed (Panel B). Figure A3.3 displays the distributions of monthly income by treatment (Panel A) and treatment and where chiefs directly taxed (Panel B).

Table 6.1.2 Effects of chief tax collection on targeting by citizen preferences[46]

		By wealth status		By wealth level				
	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average wealth
	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Citizen preferences for poor								
Chief taxed here (*Local*)	0.039	0.065	0.035	0.042	0.0999	0.019	0.044	-0.208
	(0.049)	(0.060)	(0.022)	(0.091)	(0.079)	(0.036)	(0.035)	(0.261)
Citizen preferences for poor	0.058	-0.000	0.048	-0.034	-0.006	0.021	0.077	-0.464
	(0.061)	(0.054)	(0.030)	(0.089)	(0.079)	(0.052)	(0.051)	(0.323)
Chief taxed here	-0.189**	-0.216**	-0.097**	-0.225	-0.239*	-0.055	-0.138**	0.163
X Citizen preferences for poor	(0082)	(0.097)	(0.039)	(0.164)	(0.125)	(0.063)	(0.062)	(0.432)
R^2	0.033	0.077	0.006	0.223	0.091	0.020	0.025	0.162
Observations	6267	1002	5265	446	556	2442	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.317	0.898	0.163	0.897	0.899	0.159	0.166	0.065
Panel B Citizen egalitarian preferences								
Chief taxed here (*Local*)	-0.163***	0.171***	-0.057***	-0.216***	-0.152**	0.001	-0.093***	-0.301
	(0.040)	(0.045)	(0.018)	(0.080)	(0.077)	(0.031)	(0.035)	(0.187)
Citizen egalitarian preferences	-0.115**	-0.086	-0.050*	-0.083	-0.135	0.042	-0.094*	-0.262
	(0.054)	(0.054)	(0.025)	(0.083)	(0.099)	(0.049)	(0.054)	(0.292)
Chief taxed	0.198**	0.239***	0.079**	0.287**	0.218	-0.020	0.123*	0.361

[46] This table examines heterogeneity in the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets by citizens' preferences. Panel A considers citizens' preferences that the government prioritise the poor and Panel B considers citizens' preferences that the government prioritise equally (i.e. egalitarian). Values for the citizen preference variables are continuous and computed as the share of citizens in a neighbourhood reporting a particular preference. These preferences were solicited after the tax campaign but before ticket distribution. In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile, respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1 and consider robustness to controlling for the neighbourhood leave-one-out mean and variance in Tables A3.15 and A3.16.

here								
X Citizen egalitarian preferences	(0.079)	(0.088)	(0.034)	(0.139)	(0.148)	(0.061)	(0.063)	(0.368)
R^2	0.033	0.076	0.006	0.223	0.086	0.020	0.025	0.159
Observations	6267	1002	5265	446	556	2442	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.317	0.898	0.163	0.897	0.899	0.159	0.166	0.065

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Is this more pro-poor allocation of transfers in chief tax collection neighbourhoods evidence of greater chief accountability? To assess this question, we examine to what extent chiefs' allocation is more likely to match citizens' preferences in neighbourhoods where the chief collected taxes. Household survey data reveal that the modal preference for allocating the cash transfer programme is to the poorest households and that the second most common response is that the transfers should be allocated equally to everyone (Figure A3.4). We re-estimate the main targeting results interacting the treatment indicator with the share of households within a neighbourhood whose preferred allocation of the cash transfer programme is to poor households (Table 6.1.2, Panel A) or the neighbourhood quartile in terms of the share of households whose preferred allocation of the cash transfer programme is to poor households (Figure A3.6, Panel A). The targeting gains from chief tax collection appear to come entirely from neighbourhoods where citizens prefer a pro-poor allocation. This implies that chiefs who collected taxes respond to citizens' preferences by allocating more programme tickets to poor households.[47] By contrast, in neighbourhoods where the modal citizen prefers an egalitarian distribution of transfers, tax collection increases errors in the chief's allocation of programme tickets to poor households (Panel B of Table 6.1.2 and Panel B of Figure A3.6). This result implies that chiefs who collect taxes can also respond to citizen preferences by treating residents more equally – rather than prioritising poor households — when the citizens demand that they do so. In neighbourhoods where chiefs did not collect taxes, allocation errors are indistinguishable across quartiles of citizens' preferences for both pro-poor and egalitarian preferences. These findings are robust to including controls for the leave-one-out neighbourhood mean (Table A3.15) and variance (Table A3.16) of wealth, suggesting that they are not mechanically explained by the relationship between citizens' preferences and the

[47] In Panel A of Figure A3.6, the magnitude of the treatment effect does not increase in neighbourhoods with even stronger preferences for targeting poor households. This observation is consistent with the mechanism results presented in Section 7. Indeed, we find no evidence that chiefs become more public-spirited or responsive due to tax collecting, such that they would try even harder to target poor households in neighbourhoods with an especially strong pro-poor preference. Instead, we find that tax collection allows chiefs to learn about the needs of their constituents – an input into a pro-poor allocation if the neighbourhood's citizens indeed prefer such an allocation that one would not predict would be greater in neighbourhoods with stronger pro-poor preferences.

average wealth or the amount of wealth inequality in a neighbourhood. Overall, these results are consistent with tax collection, resulting in chiefs being more accountable and responsive to citizen preferences.

6.2 Effects on nepotism and corruption

If tax collection weakened the alignment of incentives between chiefs and the local residents, it could have led to greater nepotism and corruption.

Table 6.2.1 Nepotism and fairness[48]

	Citizens' perceptions of chiefs' ticket allocation			Connections of ticket recipients to chief	
	Family members of chief	Index: other connection to chief	Poor in neighbourhood	Family member of chief	Index: other connection to chief
	(1)	(2)	(3)	(4)	(5)
Chief collected here (*Local*)	-0.044*	-0.042	-0.057**	0.042	0.112
	(0.024)	(0.054)	(0.025)	(0.052)	(0.070)
R^2	0.037	0.045	0.039	0.084	0.134
Observations	2723	2723	2723	2520	2532
Clusters	221	221	221	220	220
Control mean	.446	.048	.521	.053	.006
Control mean	.422	.088	.5	.026	.017

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

[48] This table compares a chief's favouring of their connections and citizens' perceptions of a chief's fairness in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category). Columns 1–3 are measures of citizen perceptions of a chief's fairness when allocating tickets. Column 1 is a dummy variable that takes a value of 1 if a chief was perceived to allocate hypothetical cash transfers to their family and friends first or second, before all other households (and 0 otherwise). Column 2 is an index for citizen perceptions of a chief's favouring of their other connections, including people from their tribe or church, taxpayers and members of their political party/coalition. Each index component takes a value of 1 if a chief was perceived to allocate hypothetical cash transfers to their connections first or second, before all other households (and 0 otherwise). Column 3 takes a value of 1 if a chief is perceived to allocate hypothetical cash transfers to the poorest people in the neighbourhood first or second, before all other households (and 0 otherwise). Columns 4–5 are direct measures of a chief's favouring of connections during ticket distribution. Column 4 is an index of a chief's family members, including their nuclear and extended family. Each index component takes a value of 1 if the respondent is a member of the chief's family. Column 5 is an index of other connections to a chief, including members of the same tribe (defined as belonging to the majority language group), people from the same territory, people from the same subtribe (*groupement*), people from the same church and people who have the chief's phone number. Each index component takes a value of 1 if the respondent has a connection of the chief. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level.

We first examine citizens' perceptions about chiefs' allocation, measured at endline. Citizens in neighbourhoods where chiefs collected tax perceived the chief as 9.9 per cent (4.4 percentage points) less likely to allocate programme tickets to family members (Table 6.2.1, Panel A, Column 1) (p = 0.067). However, when we consider citizens' views across a range of potential links to the chief, this difference becomes statistically insignificant (Panel A, Column 2).[49] By contrast, in line with our main targeting results, citizens in chief collection neighbourhoods perceive local chiefs as being 11 per cent (5.7 percentage points) more likely to target poor households (Column 3) (p = 0.023).

We then leverage pre-programme survey data to assess if, in fact, family members and households with connections to the chief – measured here based on ethnicity, church and political party – were more likely to receive programme tickets. Although the coefficients are positive, we observe no statistically significant differences across neighbourhoods where chiefs did and did not collect taxes (Table 6.2.1, Columns 4–5).

Table 6.2.2 Corruption and diversion[50]

	Asked something for ticket	Cash not in envelope	Transfer not received	Amount of cash missing (FC)
	(1)	(2)	(3)	(4)
Chief collected here (*Local*)	-0.006	-0.006	0.013	84.262
R^2	0.073	0.293	0.175	0.170
Observations	2464	311	470	451
Clusters	220	165	200	199
Control mean	.031	.056	.215	2875.328

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

[49] These links include belonging to the same tribe as the chief, attending the same church, being a taxpayer and belonging to the same political party/coalition.

[50] This table compares measures of corruption and diversion in ticket allocation and cash transfer in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category). Column 1 is a dummy variable that takes a value of 1 if a citizen of the neighbourhood reported that the chief asked for something in exchange for allocating the citizen a ticket (and 0 otherwise). Column 2 is a dummy variable that takes a value of 1 if a lottery winner discovered that the cash transfer was not in the envelope given by the chief, suggesting that the chief had stolen the cash (and 0 otherwise). Column 3 is a dummy variable that takes a value of 1 if a citizen reported that they did not win a cash transfer in the lottery even though enumerators' archives suggested that they had won, suggesting the chief had stolen or diverted the cash transfer (and 0 otherwise). Column 4 is the amount of the cash transfer in FC missing from the prize amount allocated to a winning citizen, calculated by subtracting the amount reported as being received in surveying from the amount the household was supposed to receive. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level.

We next explore whether collecting taxes made chiefs more likely to misuse or divert programme resources. Firstly, citizens were asked at endline to report whether the chief requested something in exchange for receiving a programme ticket. The reported rate of such a request by the chief is only 3 per cent and does not differ by whether the chief collected in the neighbourhood (Table 6.2.2, Column 1). The delivery of cash to households also created an opportunity for chiefs to pocket state monies. Lottery winners were asked at endline (1) whether the transfers they received were in an envelope (the absence of an envelope provides a measure of tampering since DIVAS agents gave the transfers to the chief for distribution to lottery winners in sealed envelopes), (2) whether they received any money and (3) the amount of money missing. We find small and statistically insignificant differences across these measures between neighbourhoods where the chief collected taxes and neighbourhoods where the chief did not (Table 6.2.2, Columns 2–4).[51] In sum, engaging in tax collection does not appear to make chiefs more nepotistic or corrupt in their allocations of programme tickets and cash transfers.

[51] The report rate of transfers not being received is high (22 per cent), yet this may reflect several factors: (1) chiefs being delayed in delivering transfers, (2) individuals concealing receipt of transfers from others in the households and (3) over-reporting of non-receipt by households for strategic purposes (e.g. in the hopes that the government or our research organisation would replenish the transfer). Therefore, we view this estimate as an upper bound on the amount of diversion. We also see no reason why survey response bias would differ across treatments.

6.3 Effects on attitudes toward chiefs

Table 6.3.1 Attitudes toward chiefs[52]

Dependent variable	$\hat{\beta}$	*SE*	R^2	*N*	$\bar{x}$ *Chief Not Tax*
	(1)	(2)	(3)	(4)	(5)
Panel A Views of the chief					
View of chief (index)	0.126**	0.050	0.040	2355	-0.065
Trust in chief	0.050	0.052	0.103	2339	-0.036
Performance of chief	0.029	0.060	0.060	1326	-0.031
Integrity of chief	0.088	0.063	0.055	1505	-0.038
Importance of chief	0.076	0.055	0.027	1879	-0.030
Panel B Demands for chief services					
Demand for chief services (index)	-0.026	0.047	0.027	2380	0.013
Demand for public goods provision by chief	-0.006	0.041	0.015	2315	0.008
Demand for conflict mediation by chief	-0.039	0.049	0.089	2359	0.023
Demand for political representation by chief	0.017	0.042	0.020	2380	-0.007
Panel C Activities of the chief					
Activity of chief (index)	-0.074	0.060	0.082	1879	0.054
Overall activity level of chief	-0.034	0.065	0.103	1335	0.026
Frequency of *salongo* in neighbourhood	-0.092	0.061	0.090	1879	0.067
Frequency of chief political representation	-0.019	0.062	0.072	1879	0.024
Frequency of chief conflict mediation	-0.106*	0.056	0.037	1879	0.055
Frequency of chief personal favours	-0.002	0.047	0.023	1879	0.001

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Does collecting taxes affect citizens' perception of the local legitimacy of the chief? We examine citizen attitudes gathered after collection but before the distribution of

[52] This table compares attitudes toward chiefs in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category). Each row summarises an OLS estimation of equation (1), comparing neighbourhoods where chiefs taxed to those where they did not, with the dependent variable in the first Column. The Column header $\hat{\beta}$ is the coefficient on the treatment indicator, followed by the cluster-robust standard error, R^2, number of observations, and the excluded group mean $\bar{x}_{Chief\,Not\,Tax}$. Panel A shows estimated differences in citizen-reported ratings of trust in the neighbourhood chief and ratings of their performance, integrity and importance, as well as an index combining all individual measures. Panel B shows estimated differences in citizens' reported demands for chief services, including that public goods be provided by the chief, that the chief conduct conflict mediation and that the chief provide political representation, as well as a combined index. Panel C shows estimated differences in activities the chief engaged in after the tax campaign in the neighbourhood, as reported by citizens, including a rating of overall activity and the reported frequency with which the chief organises *salongo* (informal taxation), provides political representation, mediates conflicts and provides personal favours, as well as a combined index. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level.

programme tickets (or announcement of the cash transfer programme), including self-reported trust in the chief and the perceived performance, integrity and importance of the chief. Considering an index of all attitudes, it appears that collecting taxes causes citizens to update their beliefs positively about their chief by 0.126 standard deviations (Table 6.3.1, Panel A, Row 1). The positive impact of tax collection on views of the chief aligns with the fact that citizens perceived chiefs as being more pro-poor (and less nepotistic) in their allocation of programme tickets (Table 6.2.1, Column 1–3), consistent with citizen preferences, in neighbourhoods where chiefs collected taxes.

7. Mechanisms

Why did tax collection cause city chiefs to target poorer households with programme tickets? We examine three potential mechanisms: (1) tax collection could have created opportunities for **learning** about the needs of households in the neighbourhood; (2) collecting taxes was a positive shock to the responsibilities of chiefs, which could have altered their **preferences**, i.e. their public-spiritedness and responsiveness to citizens; and (3) tax collection by the chief could have initiated bottom-up **citizen pressure**, or the threat thereof, leading the chief to distribute more programme tickets to poor households in line with citizens' preferences. We outline a simple decision-theoretical framework in Section A5 to describe these possible mechanisms more precisely.

7.1 Learning

A first explanation is that going door to door collecting taxes could have created opportunities for learning about households' needs and thus generated greater scope for accountability. Knowledge of household needs is an essential input into chiefs' allocation of transfers; for example, chiefs who desire to honour citizen preferences to target poor households may only be able to do so if they know which households are the poorest in the neighbourhood. In our decision theoretical framework (Section A5), the fundamental intuition is that better information reduces the risk of misallocating a well-intentioned transfer, thereby causing chiefs to divert fewer resources to the elite and instead more often target the poor. Although chiefs in Kananga are better informed than state agents (see Balán *et al.* (2022), Figure A19), they likely face information frictions because they tend to live in central and affluent parts of the neighbourhood and typically (before the tax campaign) had little reason to visit more remote areas, which are often located down steep ravines. In fact, bureaucrats and politicians alike often face information constraints that limit their ability to implement citizens' preferred policies, even if they have the will to do so (Dal Bó *et al.* 2021; Dodge *et al.* 2021; Liaqat 2019; Casey *et al.* 2021).

Table 7.1.1 Effect of tax collection on knowledge of chiefs[53]

Proportion known:	Name	Education	Job	Index
	(1)	(2)	(3)	(4)
Chief taxed here (*Local*)	0.058*	0.073***	0.005	0.133**
	(0.030)	(0.024)	(0.021)	(0.056)
R^2	0.080	0.047	0.032	0.056
Observations	2649	2631	2531	2649
Clusters	221	221	221	221
Control mean	.418	.331	.286	.037

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

To investigate changes in chiefs' knowledge as a result of tax collection, we use a quiz-like survey module administered after the 2018 property tax campaign and before the 2019 cash transfer programme. City chiefs were shown photos of 12 randomly-selected property owners in the neighbourhood and asked to provide their names, education level and occupation. We know the correct answers to these questions from household surveys and can, therefore, assess chiefs' knowledge about property owners in their neighbourhood. Tax collection appears to have promoted learning – by an estimated 0.133 standard deviations if we consider an index of all three components (Table 7.1.1, Panel A, Column 4).[54] [55] As further evidence, we examine survey questions asking citizens how much information they think the chief knows about them. Citizen perceptions mirror the pattern from the chief knowledge quiz' residents of neighbourhoods where chiefs collected taxes believe their chief is 0.208 standard deviations better informed according to an index of knowledge of house location, tax payment, job and earnings (Table A4.1).

[53] This table compares city chief's knowledge of 12 randomly-selected property owners in the neighbourhood households during the quiz-like survey module described in Section 7 in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category). Column 1 uses a dummy variable that takes a value of 1 if the chief knows the name of the owner (a 0 otherwise). Column 2 uses a dummy variable that takes a value of 1 if the chief knows the highest level of education of the owner (and 0 otherwise). Column 3 is a dummy variable that takes a value of 1 if the chief knows the occupation of the owner (and 0 otherwise). Column 4 is a standardised index of chief's knowledge of the owner's name, education and occupation. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level.

[54] There is less evidence of learning about the occupations of property owners than about their names and education levels. We suspect this may reflect the very fine categorisation of different jobs in the survey.

[55] The door-to-door nature of tax collection is surely an important reason for this learning mechanism. This effect might thus be more likely to be generally applicable to other low-income countries with low-capacity states where tax authorities delegate tax collection to local leaders and in-person tax collection is prevalent (Cogneau *et al.* 2020; Krause 2020; Okunogbe 2021).

Table 7.1.2 Error rate by chief knowledge of the inhabitants of the neighbourhood[56]

Outcome:	Errors of inclusion or exclusion			
Chief information:	Name	Education	Occupation	Index
	(1)	(2)	(3)	(4)
Panel A No controls				
Chief info > median	-0.027	-0.026	-0.028	-0.040**
	(0.019)	(0.019)	(0.019)	(0.019)
Chief characteristics controls	No	No	No	No
Neighbourhood characteristic controls	No	No	No	No
Panel B Chief characteristic controls				
Chief info > median	-0.032	-0.038*	-0.033*	-0.047**
	(0.019)	(0.020)	(0.020)	(0.059)
Chief characteristics controls	Yes	Yes	Yes	Yes
Neighbourhood characteristics controls	No	No	No	No
Panel C Chief characteristics and neighbourhood controls				
Chief info > median	-0.034	-0.039**	-0.034*	-0.056**
	(0.021)	(0.020)	(0.020)	(0.023)
Chief characteristics controls	Yes	Yes	Yes	Yes
Neighbourhood characteristics controls	Yes	Yes	Yes	Yes
R^2	0.010	0.009	0.011	0.023
Observations	221	221	221	221
Mean	.276	.276	.276	.276

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Importantly, more-informed chiefs make fewer total errors when allocating

[56] This table shows the relationship between chiefs' knowledge of the inhabitants of the neighbourhood and the average error rate in the neighbourhood. The error rate is defined using a pre-registered wealth index constructed from observable household attributes and estimated on sample-weighted data, as described in Section 4.2. The chief's knowledge of the inhabitant of the neighbourhood is measured by the percentage of correct answers when asked to provide the name (Column 1), education level (Column 2) and occupation (Column 3) of a randomly selected group of 12 property owners per neighbourhood. Column 4 measures the chief's knowledge using a standardised index of the chief's knowledge along these three dimensions. All regressions include an indicator for whether the city chief collected taxes in the neighbourhood and robust standard errors. Panel A does not include controls. Panel B controls for chief characteristics measured before the tax campaign and described in Panels A-D of Table A15 of Balán *et al.* (2022) and covering chiefs' demographics, power, experience, political ties and views of the government. Panel C controls for the same chief characteristics, as well as the neighbourhood characteristics neighbourhood and average characteristics of property owner and properties in the neighbourhood using the variables reported in Table A1.5 and measured in the baseline, midline and registration surveys from Balán *et al.* (2022).

programme tickets (Table 7.1.2 and Figure A4.1). According to our baseline specification (without controls), chiefs with above-median information are 4 percentage points less likely to make errors of inclusion or exclusion. One might be concerned that chief information is correlated with experience working as chief or other factors that could explain the lower error rate. However, controlling for chief tenure and other chief characteristics strengthens the negative relationship between knowledge and errors (Panel B of Table 7.1.2 and Figure A4.1).[57] Further controlling for neighbourhood characteristics – another potential confounder – again strengthens the relationship between information and errors (Panel C).[58] Indeed, according to this more demanding specification, chiefs with above-median information are 5.6 percentage points less likely to make errors (Table 7.1.2, Column 4). Taken together, these results provide initial evidence that tax collection led chiefs to learn about the residents of their neighbourhood, enabling them to realise a more pro-poor allocation of programme tickets.

7.2 Preferences

A second explanation is that collecting taxes changed chiefs' preferences. Prendergast (2007) notes that leaders and public officials, in particular, often respond to intrinsic motivation, public spiritedness and a sense of duty. By amplifying their responsibilities, delegating tax collection to city chiefs could similarly expand their sense of duty. Specifically, collecting taxes might have led chiefs to internalise the social contract and thus feel a greater desire to be responsive to citizen demands and needs (Prichard 2015). In our decision theoretical framework (Section A5), this mechanism corresponds to a stronger 'warm glow' utility from acting in line with citizen preferences and allocating transfers to poor households.

As a first test of preferences versus learning, we leverage the *Chief taxed here* versus *Chief taxed elsewhere* variation, i.e. comparing the allocation of programme tickets in neighbourhoods where the city chiefs taxed and in neighbourhoods where they did not tax but collected elsewhere (in another part of their jurisdiction). If learning is the only mechanism, then chiefs would allocate more programme tickets to poor households **only** in the parts of their jurisdiction where they went door to door during the tax campaign. By contrast, if taxation changes the chiefs' sense of duty and responsiveness, they would likely seek to achieve a pro-poor distribution throughout their entire jurisdiction.

We find that the reduction in errors due to chief tax collection was more pronounced

[57] These controls include chief demographics, tenure, political ties and views of the government.

[58] These controls, averaged at the neighbourhood level, include characteristics of properties and their owners using the variables reported in Table A1.5.

in neighbourhoods where the chief taxed (Table 6.1.1, Panel B). The difference between *Chief taxed here* and *Chief taxed elsewhere* neighbourhoods is significant at the 5 per cent level when we compare the probability of making any errors.[59] This heterogeneity is less clear when defining error rates using monthly household income (Table A3.2, Panel B). Although the reductions in errors are always larger in *Chief taxed here* neighbourhoods, we can only reject equality of effects for exclusion errors. We think the wealth and income results likely differ in this way because (1) self-reported income is a considerably noisier measure and (2) the wealth index measures observable indicators of need closely related to what chiefs would have easily learned going door to door during the tax campaign.

Table 7.2.1 Asking chief for information and programme ticket receipt by chief tax collection[60]

	Asked chief for information		# times asked chief for information		Received programme ticket	
	(1)	(2)	(3)	(4)	(5)	(6)
Received information flyer	0.051***	0.037**	0.098***	0.072**	0.066***	0.059***
	(0.013)	(0.015)	(0.028)	(0.029)	(0.010)	(0.014)
Chief taxed		-0.015		0.006		-.007
		(0.015)		(0.033)		(0.007)
Chief taxed x received information flyer		0.027		0.053		0.015
		(0.026)		(0.055)		(0.019)
R^2	0.015	0.016	0.010	0.011	0.005	0.006
Observations	1969	1969	1969	1969	21239	21239
Clusters	162	162	162	162	162	162
Control mean	.058	.066	.109	.107	.142	.145

[59] There appears to also be a reduction of inclusion errors among the top two quintiles in *Chief taxed elsewhere* neighbourhoods, though no corresponding reduction in exclusion errors of the poorest, consistent with information constraints in these neighbourhoods.

[60] This table examines the impact of informational flyers on household members' requests for information about the cash transfer programme and the chief's allocation of programme tickets. Twenty per cent of households within each neighbourhood in the *Information* and *Information & Audit* sub-treatment arms were randomly assigned to receive an informational flyer informing them of the cash transfer programme, as described in Section 7.3. The table compares the probability of asking the neighbourhood chief for information (Columns 1 and 2), the number of times information was requested (Columns 3 and 4) and receipt of programme tickets (Columns 5 and 6) by individual-level exposure to the information flyers. Only neighbourhoods in the *Information* and *Information & Audit* sub-treatments described in Section 7.3 are included in the sample. Columns 1, 3 and 5 pool neighbourhoods where chiefs did and did not collect taxes. Columns 2, 4 and 5 include a dummy and interaction term for a neighbourhood being assigned to chief tax collection. All regressions include tax stratum fixed effects using strata for the assignment of cross-randomised arms (assigned at the chief-level) and cluster standard errors at the neighbourhood level.

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

A second test of the preference mechanism exploits the *Information* arm of the cross- randomised mechanism experiment. This arm was designed to nudge citizens to make demands to chiefs regarding the cash transfer programme – and thus to assess if collecting taxes made chiefs more responsive to such demands. Information flyers were successful in encouraging citizens to ask the chief about the cash transfer programme: households that received flyers were 87.9 per cent (i.e. 5.1 percentage points) more likely to report asking the chief for information about the programme (Table 7.2.1, Column 1), asked the chief for information 89.9 per cent more times (Column 3) and were 46 per cent (i.e. 6.6 percentage points) more likely to receive a programme ticket (Column 5). However, chief responsiveness to citizens' demands was not more pronounced in neighbourhoods where they collected taxes (Columns 2, 4 and 6). Moreover, the impact of tax collection in reducing targeting errors was not more pronounced in the *Information* arm (Table 7.2.2).[61] If anything, the coefficients on the interaction term are positive, suggestive of slightly worse targeting.[62] It thus appears unlikely that greater responsiveness to citizen demands explains the more pro-poor allocation of programme tickets caused by delegating tax collection responsibilities to chief.

[61] The logic of this test is that greater transparency could have boosted citizen demand for cash transfers. If chiefs were more responsive to poor citizens making such demands then such responsiveness could explain the main targeting results. However, we find no evidence of this (Figure A4.2).

[62] We discuss the possibility that providing information undermined the collector chiefs' ability to target poor households in Section 9.

Table 7.2.2 Effects of chief tax collection and cross-randomised treatments on targeting by wealth[63]

	Analysis:		By wealth status		By wealth level				
	Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average wealth
					(very poor)	(near poor)	(middle)	(rich)	
	Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Chief taxed here (*Local*)		-0.076**	-0.071**	-0.021	-0.114	-0.031	0.013	-0.052**	-0.118
		(0.034)	(0.035)	(0.013)	(0.076)	(0.040)	(0.021)	(0.023)	(0.179)
Chief taxed here (*Local*) x information		0.077	0.087*	0.008	0.133	0.034	-0.033	0.046	0.128
		(0.050)	(0.046)	(0.019)	(0.088)	(0.052)	(0.034)	(0.031)	(0.237)
Information		-0.011	-0.038	0.023*	-0.067	0.005	0.064**	-0.014	0.074
		(0.035)	(0.027)	(0.013)	(0.044)	(0.036)	(0.026)	(0.024)	(0.180)
Chief taxed here (*Local*) x audit		0.005	0.011	0.007	0.059	-0.029	-0.027	0.036	-0.051
		(0.045)	(0.042)	(0.018)	(0.088)	(0.048)	(0.027)	(0.031)	(0.219)
Audit		0.019	-0.008	0.022	-0.044	0.031	0.027	0.015	0.028
		(0.034)	(0.019)	(0.013)	(0.029)	(0.029)	(0.019)	(0.024)	(0.149)
R^2		0.007	0.011	0.002	-0.044	0.031	0.027	0.015	0.028
Observations		6267	1000	5267	446	554	2444	2823	4384
Clusters		221	216	221	193	195	218	221	220
Control mean		.312	.913	.146	.937	.884	.131	.164	.03

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

We next examine if collector chiefs appear more prosocial toward their

[63] This table examines the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets by the cross-randomised sub-treatments described in Section 7.3. Specifically, the table compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax by exposure to the cross-randomised information and collective action treatments (the excluded category is neighbourhoods where chiefs did not tax and that received no cross-randomised treatment). In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile, respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects using strata for the assignment of cross- randomised arms (assigned at the chief-level) and cluster standard errors at the neighbourhood level.

neighbourhoods. Before the cash transfer programme, chiefs were offered a chance to contribute a share of their transport stipend to the total funds that would be allocated to households in the neighbourhood. Nearly 80 per cent of chiefs chose to contribute, with an average amount of FC395 – about 20 per cent of the stipend (Table A4.2). However, this effect was neither greater nor smaller in neighbourhoods where chiefs had collected taxes.

Lastly, we test the preference mechanism by examining if citizens perceive chiefs who collected taxes to be harder-working or to be engaged in other types of activities in their neighbourhoods – as might be predicted following a boost to their public-spiritedness. However, we do not find evidence that this is the case. City chiefs are not perceived by citizens as being more active in terms of organising salongo, mediating conflicts, providing political representation, or providing personal favours in neighbourhoods where they collected property tax (Table 6.3.1, Panel C).[64] They also do not appear to be fairer or more progressive in the way they administer *salongo* (Table A4.3), as one might expect if tax collection shaped chiefs' preferences for redistribution.[65]

In sum, we find limited evidence consistent with a preference mechanism.

7.3 Citizen pressure

A third possible mechanism is that tax collection could lead chiefs to act more closely in accordance with citizen preferences because they anticipate bottom-up accountability pressure. Indeed, there is a large body of evidence that taxation can stimulate citizen demand for accountability (Ross 2004; Paler 2013; Martin 2014; Prichard 2015), including evidence from the 2016 tax campaign in Kananga (Weigel 2020). City chiefs might have been more pro-poor in the neighbourhoods they taxed because they anticipated more pronounced citizen monitoring and so prospectively chose a more pro-poor allocation of programme tickets. In our decision theoretical framework (Section A5), this mechanism amounts to a tighter reputation constraint, i.e. the chief is less able to divert resources without losing power.

[64] Estimated effects on chief activities are generally negative, which is potentially consistent with tax duties displacing – at least in the short run – chiefs' other responsibilities. However, the estimated coefficients are statistically insignificant, both individually and when combined into an index.

[65] City chiefs' self-reports largely mimic citizens' observations (Table A4.10).

Table 7.3.1 Chief priors about audit threat[66]

Chief priors:	Monitoring and pressure by citizens		Proportion of citizens who will monitor and come together to complain if unhappy		Monitoring and pressure relative to other neighbourhoods in Kananga	
	(1)	(2)	(3)	(4)	(5)	(6)
Info + audit	0.502***	0.164	9.022**	-3.444	0.423**	0.289
	(0.164)	(0.229)	(4.018)	(5.513)	(0.173)	(0.245)
Chief taxed x *info + audit*		0.668**		24.707***		0.258
		(0.320)		(7.705)		(0.342)
Chief taxed		-0.472*		-15.579**		-0.313
		(0.255)		(6.126)		(0.272)
R^2	0.076	0.104	0.063	0.125	0.057	0.066
Observations	153	153	153	153	153	153
Control mean	.146	.083	48.053	51.724	.071	.031

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

We test this mechanism by leveraging the *Information & Audit* arm of the mechanism experiment. This arm was designed to lower the cost of collective action and thus raise chiefs' perceived probability of bottom-up monitoring. We first test the first stage – that citizens demanded the community-audit meetings and that this impacted chiefs' perceptions of citizen pressure. The audit meeting request form submission rate averaged 18 per cent, representing a non-trivial share of households undertaking costly efforts to submit their audit meeting request forms at the centrally-located drop boxes.[67] Moreover, the *Information & Audit* sub-treatment increased the perceived likelihood of monitoring and pressure by citizens by 0.5 standard

[66] This table examines differences in chiefs' reported beliefs about the likelihood of monitoring and pressure by citizens in advance of the programme ticket distribution across treatment (chief tax collection) and the *Control* and *Information & Audit* sub-treatment arms. The sample is restricted to neighbourhoods assigned to only the *Control* and *Information & Audit* arms and excludes those in the *Information* arm. The outcomes are chiefs' prior beliefs about the monitoring and pressure that citizens will exert over the cash transfer programme (Columns 1–2), the proportion of citizens chiefs believe will monitor and come together to complain if unhappy (Columns 3–4) and how chiefs rated the citizen monitoring and pressure relative to other neighbourhoods in Kananga (Columns 5–6). These measures were solicited from chiefs before ticket distribution through chief surveys. All regressions include tax stratum fixed effects using strata for the assignment of cross-randomised arms (assigned at the chief-level) and cluster standard errors at the neighbourhood level.

[67] Form submission was skewed: in 37.8 per cent of neighbourhoods the submission rate was higher than the average, reaching a maximum of 75 per cent (Figure A4.3). Form submission rates overall do not differ significantly across actors, nor do they vary by whether chiefs collected taxes, as analysed in depth in Ahrenshop *et al.* (2023).

deviations (Table 7.3.1, Column 1).[68] This effect was even more pronounced in neighbourhoods where chiefs collected taxes (Column 2). This cross-randomised intervention thus appears to have effectively raised chiefs' perceptions about the probability of bottom-up pressure. Nevertheless, the *Information & Audit* sub-treatment caused no differential shift in the targeting of programme tickets in neighbourhoods where chiefs collected taxes (Table 7.2.2), nor did it differentially reduce corruption (Table A4.4). This is striking because on average chiefs who anticipated more citizen monitoring were indeed less likely to divert resources from the programme (Table A4.5). Thus, although the *Information & Audit* did have an impact on the perceived probability of citizen monitoring (Table 7.3.1), particularly in neighbourhoods where chiefs collected taxes, this increase in perceived bottom-up accountability pressure does not appear to explain our main targeting results.[69] [70]

Ultimately, the evidence is most consistent with a learning mechanism, rather than a preference or citizen pressure mechanism.

[68] We observe similarly large effects when examining survey questions concerning the share of citizens who will engage in monitoring (Column 3) and the relative monitoring pressure compared to other neighbourhoods (Column 5).

[69] As the *Information & Audit* sub-treatment combined the opportunity to submit forms requesting audit meetings with the informational flyers provided in the *Information* arm, one possible explanation for the null effects on targeting is that these flyers were distributed randomly, i.e. in an untargeted fashion. As discussed in the previous section, by stimulating demands from citizens across the wealth distribution, this transparency intervention may have exerted a countervailing force on the distribution for programme tickets.

[70] Relatedly, we do not observe any differences in citizens' reported demand for chiefs' services across treatment and control (Table 6.3.1, Panel B).

8. Alternative explanations

In this section, we consider three alternative explanations for the change in the distribution of programme tickets caused by delegating tax collection to city chiefs.

8.1 Change in chiefs' conception of need

Firstly, collecting taxes might have changed chiefs' conception of need when allocating tickets. Specifically, local conceptions of need often diverge from the purely economic conceptions represented in proxy means testing (Alatas *et al.* 2012), with widows or disabled individuals being conceived of as particularly vulnerable, for instance. According to this explanation, our treatment effects might reflect a shift from such a conception of need to one based on observable economic characteristics. Households headed by widows, the elderly or disabled individuals were indeed more likely to receive programme tickets (Table A4.7).[71] This is true even among the top 80 per cent of the wealth distribution, suggesting that this dimension of perceived vulnerability is distinct from wealth. However, we find no evidence that chiefs are more or less likely to give programme tickets to these vulnerable groups in neighbourhoods where they collected taxes. As a result, a shift in conception of need is unlikely to explain our targeting results.

8.2 Change in chiefs' obedience to the state

Another alternative is that collecting taxes made chiefs more obedient to the state.[72] After all, the state's instruction for this cash transfer programme was to target the poorest citizens, so the state's and citizens' preferences were well aligned. However, when asked if they should obey the state even if this means going against their constituents, chiefs were not more likely to agree in neighbourhoods where they collected taxes (Table A4.9, Column 1).[73] Similarly, when asked whether they would rather side with the community's preference or the state's preference when locating a hypothetical school in the neighbourhood, chiefs were no more likely to take the state's side in neighbourhoods where they collected taxes (Table A4.9, Column 2). Moreover, obedience to the state as a mechanism would result in reduction in

[71] Table A4.8 considers targeting by each exemption category independently.

[72] A related possibility is that collector chiefs wanted to impress the state in order to retain their new responsibilities as tax collectors. This explanation is also inconsistent with the evidence discussed in this paragraph.

[73] The exact question asks if the chief agrees more that their 'primary responsibility is to serve the people on their avenue/neighbourhood, even if it means disobeying the state' or that 'their primary responsibility is to obey the state, even if it means disobeying the wishes of the people on the avenue/neighbourhood'.

exclusion and inclusion errors in both *Chief taxed here* and *Chief taxed elsewhere* neighbourhoods. However, as noted in Section 7.2, the reduction in errors due to chief tax collection was more pronounced in *chief taxed here* neighbourhoods (Table 6.1.1, Panel B). Similarly, an obedience mechanism would predict a reduction in exclusion and inclusion errors everywhere, instead of only in neighbourhoods where the modal citizen prefers a pro-poor allocation to an egalitarian allocation (Table 6.1.2 and Figure A3.6). Overall, there is thus little evidence consistent with enhanced chief obedience to the state as a mechanism.

8.3 Hawthorn effects

Could researcher involvement explain the targeting results, either because collector chiefs had greater contact with the research team or because they experienced more pronounced demand effects? All chief interactions with the research team were designed to be consistent: the same number and duration of surveys, the same survey participation incentives, the same (randomly-assigned) enumerators. However, it is of course possible that collecting taxes could interact in some subtle way with demand effects such that collector chiefs feel a stronger desire to please the researchers, spurring them to commit fewer errors. To test this possibility, we examine chiefs' responses to survey questions where one would anticipate demand effects. The chiefs knew that the researchers had chosen to evaluate a cash transfer programme in an effort 'to study the economic development of Kananga'. The most natural inference to draw would be that the researchers cared about promoting development. We therefore examine the extent to which chiefs self-report performing a range of pro-development leadership activities, including helping their constituents to (1) find enough money to survive and find jobs, (2) repair roads and local infrastructure and (3) resolve local disputes. Inconsistent with differential demand effects, there are no significant differences in chiefs' answers to these questions based on where they collected taxes (Table A4.10). Moreover, a Hawthorn Effects interpretation cannot easily account for the heterogeneity caused by *Chief taxed here* and *Chief taxed elsewhere* or citizen preferences for pro-poor versus egalitarian allocations. Although it is always hard to fully allay all Hawthorn Effect concerns, they seem unlikely to explain the pattern of results we document in this paper.

8.4 Change in chiefs' human capital

A final alternative is that collecting taxes made chiefs more organised and competent. Chiefs received training before the tax campaign. They gained experience operating handheld receipt printers and became familiar with taxpayer IDs. Collector chiefs' higher human capital could thus partly explain better targeting. We

test this possibility using two real-world measures of chief human capital: (1) whether they showed up on time to the public lotteries to select winners for the cash transfer programme and (2) whether they made errors writing the household codes on programme tickets, which could lead us to falsely conclude that a household was mistargeted when in fact the code was simply wrong. However, collector chiefs do not appear less likely to be late (or early) or to make coding errors (Table A4.11). According to the available evidence, chiefs do not appear to have become more competent and punctual thanks to the tax campaign.

9. The value of discretion

Although governments often seek to limit the discretion of frontline field workers, three pieces of evidence suggest that constraints on chiefs' discretion counteracted the improvements in targeting caused by chiefs.

Firstly, there is suggestive evidence that the informational flyer attenuated the pro-poor effect of tax collection on the chiefs' allocation of programme tickets. The rate of errors was somewhat higher in neighbourhoods where the chief collected taxes and citizens received these informational flyers (Table 7.2.2, Column 1). Although these differences are only weakly statistically significant for exclusion errors, they have an intuitive explanation. Because informational flyers were randomly distributed, they did not solely reach poor households. By encouraging some non-poor households to demand programme tickets from the chief, this transparency intervention might have unwittingly countered the chief efforts to allocate programme tickets to poor households. Although this evidence is only suggestive, it raises the possibility that untargeted transparency interventions can impede the delivery of development aid, by limiting the discretion of local leaders to target poor households.

Secondly, we exploit the fact that chiefs were randomly provided with employment information about a set of households in their neighbourhoods. This information was aimed to assist chiefs in targeting poor households. However, providing employment information does not impact targeting in *Central* neighbourhoods (Table A4.12). Instead, there is suggestive evidence that it worsened targeting in chief collection neighbourhoods. It appears to cause an increase in exclusion errors in the second decile (11–20 per cent) and a corresponding increase in inclusion errors in the second and third quintiles (21–60 per cent). Chiefs would have naturally faced uncertainty about which households to target close to the cutoff at the 20th percentile. The employment information appears to have induced errors around this cutoff, suggesting that when uncertain, chiefs targeted households listed as unemployed. But targeting these households was, in fact, worse than relying on their own information because the unemployed are not, on average, in the bottom quintile of the wealth distribution. Indeed, unemployment is so high in Kananga that it does not provide a helpful signal, given the objective of targeting the bottom quintile of the wealth distribution. Providing employment information thus unwittingly led chiefs to rely less on their own information and to make more errors as a result – further evidence of the value of allowing tax collector chiefs to use their discretion.

A third possible constraint on chiefs' discretion was taxpayers' demands. If taxpayers sought out the chief to whom they paid taxes to demand something in return for tax compliance, this could also induce errors, since taxpayers have above-

average wealth. There is indeed a positive correlation between tax payment and receiving programme tickets in neighbourhoods where chiefs collected taxes (Table A4.6, Columns 1 and 4).[74] Moreover, because taxpayers tend to be wealthier property-owners, this appears to translate into an increase in tickets allocated to the top 80 per cent, i.e. an increase in errors of inclusion. The reciprocity to taxpayers observed in neighbourhoods with chief tax collection is thus a third countervailing force on targeting poor households by chiefs who collected taxes.

Without these three countervailing constraints on chief discretion, the impact of collecting taxes on targeting might have been even larger than the 6.5 percentage point reduction in total errors it caused on average.

10. Conclusion

This paper has provided evidence that delegating tax collection to informal leaders strengthened those leaders' local accountability. They targeted more cash transfer programme tickets to poor households, consistent with citizen preferences, and were no more likely to engage in nepotism or diversion. We provided evidence that one key mechanism behind this greater targeting of poor households is that door-to-door tax collection equipped chiefs with better information about the neediest households in the neighbourhood, enabling them to achieve a more pro-poor allocation of programme tickets.

In addition to allaying concerns that chief tax collection could sew 'decentralised despotism', these results suggest a synergy between the information needed by the state for taxation and transfers. In low-capacity settings, local leaders like chiefs often have responsibilities spanning this nexus. This paper demonstrates that by deepening leaders' responsibilities in revenue generation, the state can exploit this synergy to simultaneously bolster their effectiveness in allocating expenditure.

[74] These results are correlations since tax compliance is endogenous to tax collection by neighbourhood chiefs.

Supplementary data and appendices for online publication

Appendix 1 Exhibits from Section 3

Table A1.1 Timing of all activities and data collection

Activity	Actor	Timing	N	J
Tax campaign				
Taxation				
Property registration	Collectors	May–December 2018	29,391	221
Tax visits	Collectors	May–December 2018	29,391	221
Evaluation				
Baseline survey	Enumerators	July–December 2017	2,649	221
Midline survey	Enumerators	June 2018-February 2019	22,430	221
Endline survey	Enumerators	March-September 2019	2,413	221
Cash transfer programme				
Programme				
Ticket distribution	Chiefs	June–October 2019	4,401	221
Lottery	Chiefs and DIVAS	June–October 2019	221	221
Cash transfer distribution	Chiefs	June–October 2019	1,105	221
Evaluation				
Endline survey	Enumerators	June–December 2019	6,267	221

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Notes: N = number of observations, J = number of clusters (neighbourhoods). Taxation and tax campaign evaluation surveys correspond to the sample in Balán *et al.* (2022) (Table 6.1.1) for *Central* and *Local* tax collection neighbourhoods only. The primary targeting outcomes result from merging official property register records, household survey data from the tax campaign and ticket distribution data from the cash transfer programme. We discuss this table in Section 4.

Table A1.2 Experimental design: cross-randomised arms

	No info	Info	Info + audit
Chiefs do not collect taxes	T1 (28)	T2 (32)	T3 (50)
Chiefs collect taxes	T4 (31)	T5 (29)	T6 (51)

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: The number of clusters (neighbourhoods) are shown in parentheses. We discuss this table in Section 7.3.

Table A1.3 Timeline: cross-randomised arms

Activity	Actor	Timing	N	J
Anti-poverty programme		Jun-Oct 2019		
1. Flyer and audit form distribution	SOCICO		4,317	162
2. Audit form submission	Citizens		2,706	101
3. Ticket distribution	Chiefs		4,401	221
4. Lottery	Chiefs & DIVAS		221	221
5. Cash transfer distribution	Chiefs		1,105	221
6. Community audit meetings	SOCICO	Dec 2019-Feb 2020	1,658	11

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: N = number of observations, J = number of clusters (neighbourhoods). We discuss this table in Section 7.3.

Figure A1.1 Information form example

REPUBLIQUE DEMOCRATIQUE DU CONGO
PROVINCE DU KASAÏ OCCIDENTAL
MINISTERE DES AFFAIRES SOCIALES, ACTION HUMANITAIRE ET SOLIDARITE NATIONALE (DIVAS)

Announcement : Development Program

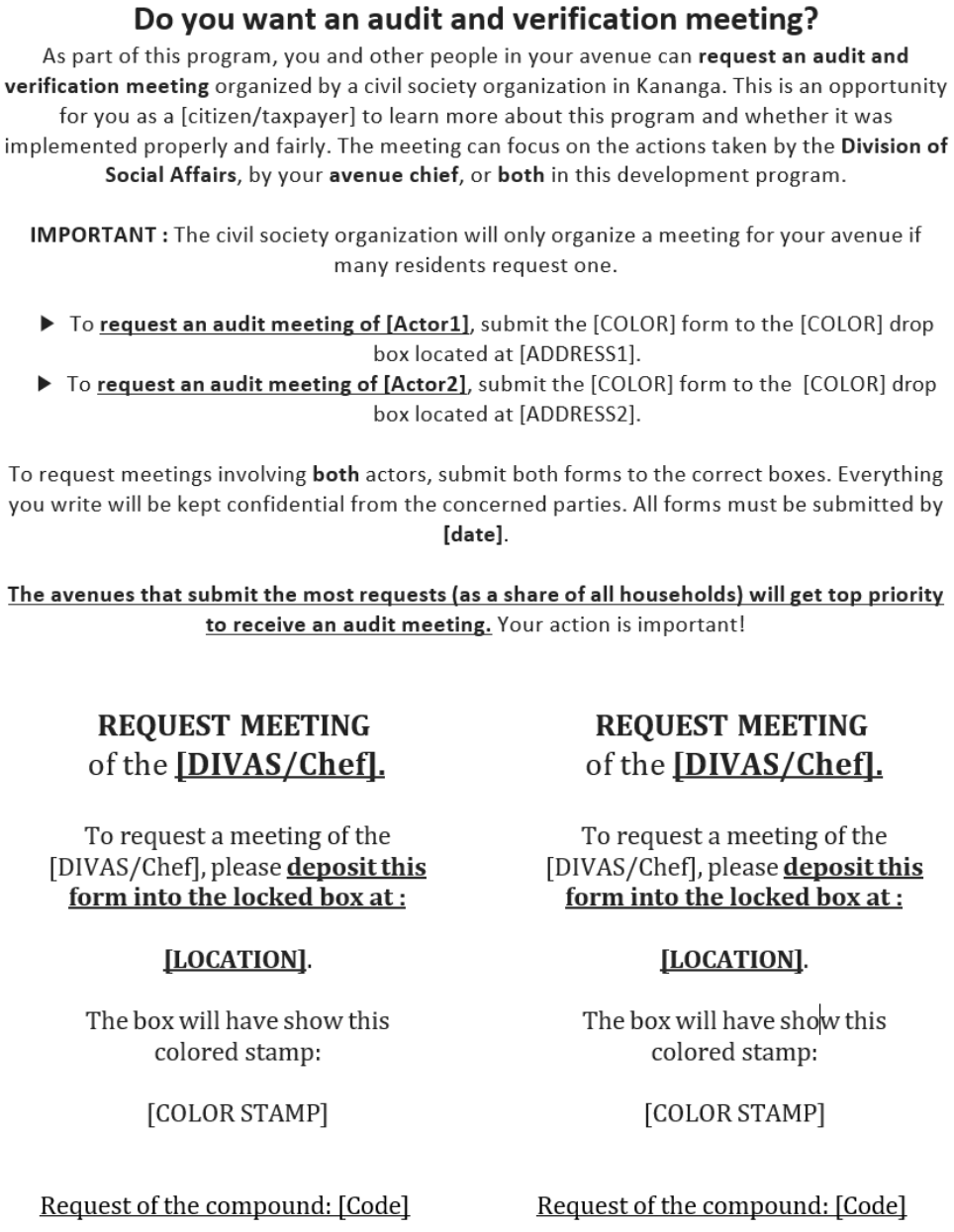
The Ministry of Social Affairs of the Provincial Government of Kasaï Central has the honor of announcing a development program that will take place in this avenue in the coming weeks. For this program, several residents will receive cash transfers with the aim of boosting local development. Unfortunately, there is not enough for everyone. Thus, there will a lottery to choose 5 winners on this avenue.

[Chief] will distribute lottery tickets to inhabitants of this avenue from **[date training]** to **[date_draw]**. See the chief for more information.

Informational flier for property owner **[name]** in the compound **[compound]**. Note : this flier does not guarantee receipt of a ticket.

Source: Authors' translation of audit fliers distributed by DIVAS 2019.

Figure A1.2 Audit form example



Do you want an audit and verification meeting?

As part of this program, you and other people in your avenue can **request an audit and verification meeting** organized by a civil society organization in Kananga. This is an opportunity for you as a [citizen/taxpayer] to learn more about this program and whether it was implemented properly and fairly. The meeting can focus on the actions taken by the **Division of Social Affairs**, by your **avenue chief**, or **both** in this development program.

IMPORTANT : The civil society organization will only organize a meeting for your avenue if many residents request one.

- To **request an audit meeting of [Actor1]**, submit the [COLOR] form to the [COLOR] drop box located at [ADDRESS1].
- To **request an audit meeting of [Actor2]**, submit the [COLOR] form to the [COLOR] drop box located at [ADDRESS2].

To request meetings involving **both** actors, submit both forms to the correct boxes. Everything you write will be kept confidential from the concerned parties. All forms must be submitted by **[date]**.

The avenues that submit the most requests (as a share of all households) will get top priority to receive an audit meeting. Your action is important!

REQUEST MEETING
of the **[DIVAS/Chef].**

To request a meeting of the [DIVAS/Chef], please **deposit this form into the locked box at :**

[LOCATION].

The box will have show this colored stamp:

[COLOR STAMP]

Request of the compound: [Code]

REQUEST MEETING
of the **[DIVAS/Chef].**

To request a meeting of the [DIVAS/Chef], please **deposit this form into the locked box at :**

[LOCATION].

The box will have show this colored stamp:

[COLOR STAMP]

Request of the compound: [Code]

Source: Authors' translation of audit fliers distributed by DIVAS 2019

Table A1.4 Balance of wealth and asset measures

	N (1)	Central Mean (2)	Local (3)
Wall quality	6152	0.045	-0.018
			(0.041)
Roof quality	6153	0.033	-0.034
			(0.0391)
Erosion threat	6267	0.007	0.004
			(0.076)
Road quality	6267	0.056	-0.061
			(0.080)
Accessibility to main avenue	6267	0.078	-0.113
			(0.080)
Compound has fence	6153	0.053	-0.067
			(0.0675)
Electricity access	6069	0.055	-0.029
			(0.057)
Vehicle ownership	6270	0.023	-0.035
			(0.051)
F, p			0.612, 0.767

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table reports the coefficients from balance tests estimated by regressing wealth and asset measures on a treatment indicator for a neighbourhood being taxed directly by the local chief, including randomisation stratum fixed effects and clustering standard errors at the neighbourhood level. Neighbourhoods where chiefs did not directly tax form the omitted category. Measures of characteristics are drawn from households' surveys for the sample described in Section 4 and reflect the measures in the pre-specified wealth index, as well as measures of assets considered in Table A3.1. The bottom row contains the statistics for tests of the omnibus null hypothesis that the treatment effects for the covariates studied in the table are all zero using parametric F tests, using regressions that include stratum fixed effects and cluster standard errors at the neighbourhood level. Further balance tests are provided in Balán et *al.* (2022) (Table 6.2.1). We discuss these results in Section 3.4.

Table A1.5 Cross-randomisation balance: Balán *et al.* (2022) characteristics

	N (1)	No Info Mean (2)	Info (3)	Info + Audit (4)
Panel A: Property owner characteristics				
Years of education^{B}	2319	10.489	-0.079	-0.138
			(0.325)	(0.325)
Electricity^{B}	2329	0.126	0.022	0.001
			(0.021)	(0.020)
Log HH monthly income^{B}	2307	10.695	-0.247	-0.241
			(0.199)	(0.194)
Trust of chief^{B}	2319	3.096	0.198**	0.029
			(0.080)	(0.078)
Trust of national government^{B}	2193	2.534	0.091	-0.028
			(0.081)	(0.070)
Trust provincial government^{B}	2209	2.480	0.051	-0.076
			(0.085)	(0.074)
Trust of tax ministry^{B}	2189	2.374	-0.015	-0.104
			(0.080)	(0.073)
Gender^{M} (1 = male)	14134	0.768	0.008	-0.007
			(0.016)	(0.014)
Age^{M}	12554	54.648	-0.681	0.928*
			(0.627)	(0.551)
Majority tribe^{M}	14582	0.773	0.027	0.022
			(0.036)	(0.030)
Employed^{M}	15627	0.730	0.002	-0.018
			(0.020)	(0.018)
Salaried^{M}	15628	0.246	-0.004	0.012
			(0.016)	(0.013)
Works for government^{M}	15628	0.147	-0.000	0.020**
			(0.012)	(0.009)
Relative works for government^{M}	17376	0.229	0.026	0.030**
Panel B: Property characteristics			(0.017)	(0.014)
House quality^{M}	17719	0.001	0.004	0.031
			(0.133)	(0.111)
Distance to state buildings and city centre^{R}	28598	1.445	0.083	-0.128
			(0.121)	(0.108)
Distance to health institutions^{R}	28598	0.316	0.048	-0.007
			(0.035)	(0.028)
Distance to education institutions^{R}	28598	0.605	0.078	0.004
			(0.057)	(0.051)
Distance to roads^{R}	27984	0.385	-0.029	0.011
			(0.064)	(0.062)
Distance to eroded areas^{R}	27984	0.133	-0.006	-0.009
Panel C: Neighbourhood characteristics			(0.017)	(0.017)
Per capita property tax revenues in 2016^{B}	221	169.070	-77.185	-90.249
			(82.604)	(77.007)

Affected by conflict in 2017^{B}	221	0.020	-0.025	-0.008
			(0.033)	(0.030)

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table reports the coefficients from balance tests estimated by regressing baseline and midline characteristics for property owners (Panel A), properties (Panel B) and neighbourhoods (Panel C) on indicators for the cross-randomised treatment arms, including randomisation stratum fixed effects and clustering standard errors at the neighbourhood level. The control arm is the omitted category. Superscripts B, M and R denote variables from baseline, midline and registration respectively from Balán *et al.* (2022). Balance tests for wealth and asset characteristics are shown in Table A1.6. We discuss these results in Section 3.4.

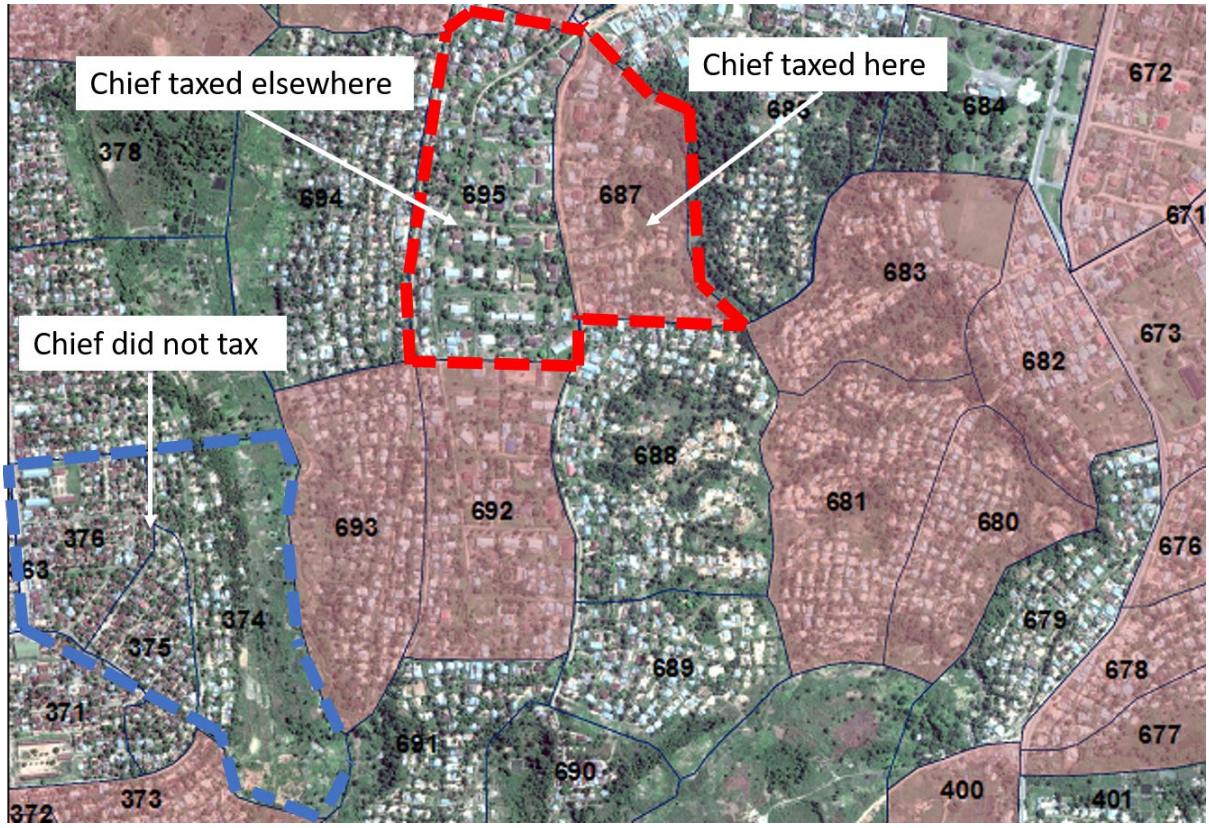
Table A1.6 Cross-randomisation balance of wealth and asset measures

	N (1)	No Info Mean (2)	Info (3)	Info + Audit (4)
Wall quality	6152	0.0312	-0.0008	0.0122
			(0.0620)	(0.0533)
Roof quality	6153	0.0093	0.0204	0.0367
			(0.0573)	(0.0465)
Erosion threat	6267	0.0182	0.0290	-0.0157
			(0.1094)	(0.0979)
Road quality	6267	-0.0371	0.1560	-0.0133
			(0.1241)	(0.1206)
Accessibility to main avenue	6267	0.0397	0.1156	-0.1213
			(0.1282)	(0.1094)
Compound has fence	6153	-0.0027	0.1075	0.0065
			(0.1050)	(0.0879)
Electricity access	6069	0.0132	0.0303	0.0551
			(0.0857)	(0.0790)
Vehicle ownership	6270	0.0346	-0.0411	-0.0195
			(0.0830)	(0.0780)
F , p (vs. No Info)			1.149, 0.336	1.131, 0.345
F, p (Info vs. Audit)			1.540, 0.147	

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table reports the coefficients from balance tests estimated by regressing wealth and asset measures on indicators for the cross-randomised treatments, including randomisation stratum fixed effects and clustering standard errors at the neighbourhood level. Control neighbourhoods form the omitted category. Measures of characteristics are drawn from households' surveys for the sample described in Section 4 and reflect the measures in the pre-specified wealth index, as well as measures of assets considered in Table A3.1. The bottom row contains the statistics for tests of the omnibus null hypothesis that the treatment effects for the covariates studied in the table are all zero using parametric F tests, using regressions that include stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 3.4.

Appendix 2 Exhibits from Section 5

Figure A2.1 Comparing neighbourhoods where chief taxed, chief taxed elsewhere in their jurisdiction and chief did not collect anywhere in their jurisdiction



Source: Google Maps, ©2022, created by authors in ARcGIS/QGIS using data from DGRKAC 2018.
Notes: This figure shows an example of two chief jurisdictions, as shown by the red and blue dotted lines. In the red-dotted jurisdiction, the chief taxed in one part of the jurisdiction (in neighbourhood number 687, shown in red) and did not tax in another part of the jurisdiction (in neighbourhood number 695). In the blue-dotted jurisdiction, the chief did not tax in any neighbourhoods (neighbourhood numbers 374, 375 and 376). Neighbourhood 687 is an example of a neighbourhood where the chief taxed ($\text{Chief TaxedHere} = 1$ and $\text{Chief TaxedElsewhere} = 0$). Neighbourhood 695 is an example of a neighbourhood where the chief taxed elsewhere in the jurisdiction ($\text{Chief TaxedHere} = 0$ and $\text{Chief TaxedElsewhere} = 1$). Neighbourhoods 374, 375 and 376 are examples of neighbourhoods where the chief did not tax in any part of their jurisdiction ($\text{Chief TaxedHere} = 0$ and $\text{Chief TaxedElsewhere} = 0$). We discuss this figure in Section 5.

Appendix 3 Exhibits from Section 6

Table A3.1 Effects of chief tax collection on targeting by wealth and assets

Analysis:		By wealth status		By wealth level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether chief taxed there								
Chief taxed here (*Local*)	-0.061***	-0.054***	-0.016**	-0.082***	-0.048	-0.004	-0.030**	-0.102
	(0.017)	(0.017)	(0.007)	(0.028)	(0.032)	(0.012)	(0.013)	(0.067)
R^2	0.027	0.070	0.006	0.152	0.093	0.016	0.021	0.154
Observations	6270	1074	5196	502	572	2614	2582	4385
Clusters	221	219	221	208	194	221	221	220
Control mean	0.319	0.892	0.161	0.899	0.885	0.162	0.161	0.036
Panel B Comparing neighbourhoods by whether chief taxed anywhere								
Chief taxed elsewhere (*Central*)	-0.007	-0.018	-0.010	0.006	-0.039	0.022	-0.044*	-0.169
	(0.025)	(0.020)	(0.012)	(0.031)	(0.035)	(0.016)	(0.023)	(0.103)
Chief taxed here (*Local*)	-0.064***	-0.064***	-0.021**	-0.080***	-0.072*	0.006	-0.054***	-0.191**
	(0.019)	(0.020)	(0.009)	(0.028)	(0.039)	(0.013)	(0.019)	(0.091)
R^2	0.027	0.070	0.006	0.152	0.094	0.016	0.022	0.157
Observations	6270	1074	5196	502	572	2614	2582	4385
Clusters	221	219	221	208	194	221	221	220
Control mean	0.314	0.0889	0.166	0.895	0.882	0.158	0.175	0.066
p-value test: collected *here* vs *elsewhere*	0.009	0.021	0.251	0.019	0.343	0.300	0.505	0.782

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Notes: This table examines the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets. Specifically, Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using an index of measures from the pre-specified wealth index, as well as an individual indicators for possessing electricity, a vehicle, a fence and a roof of concrete, tiles or sheet iron (as opposed to thatch, straw or bamboo), and sampling weights are applied. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile, respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.2 Effects of chief tax collection on targeting by income

Analysis:		By income status		By income level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether local chief was tax collector there								
Chief collected here (*Local*)	-0.044**	-0.102*	-0.033	-0.130	-0.077	-0.014	-0.054**	-0.037
	(0.019)	(0.052)	(0.021)	(0.107)	(0.066)	(0.029)	(0.027)	(0.062)
R^2	0.022	0.168	0.026	0.308	0.294	0.056	0.048	0.135
Observations	2315	352	1963	128	224	954	1009	604
Clusters	221	213	221	128	181	220	221	207
Control mean	.337	.721	.268	.738	.712	.288	.249	.085
Panel B Comparing neighbourhoods by whether local chief collected anywhere								
Chief collected elsewhere (*Central*)	-0.049*	0.051	-0.058*	0.147	-0.013	0.023	-0.084**	-0.150
	(0.027)	(0.076)	(0.030)	(0.156)	(0.096)	(0.044)	(0.037)	(0.098)
Chief collected here (*Local*)	-0.070***	-0.078	-0.063**	-0.058	-0.083	-0.026	-0.098***	-0.111
	(0.024)	(0.063)	(0.027)	(0.126)	(0.074)	(0.037)	(0.034)	(0.084)
R^2	0.023	0.169	0.028	0.316	0.294	0.057	0.052	0.139
Observations	2315	352	1963	128	224	954	1009	604
Clusters	221	213	221	128	181	220	221	207
Control mean	.362	.700	.299	.697	.702	.293	.304	.019
p-value test: collected *here* vs *elsewhere*	0.350	0.054	0.841	0.145	0.434	0.930	0.657	0.594

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Notes: This table examines the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets. Specifically, Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using the reported household monthly incomes. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the

income measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the income distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average income level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Figure A3.1 Robustness: different need measures compared

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This figure compares the treatment effects on total errors, errors of exclusion and errors of inclusion when measuring need using the wealth index, the wealth and assets index and for self-reported income. We discuss these results in Section 6.1.

Table A3.3 Effects of chief tax collection on targeting by wealth – no sampling weights

Analysis:		By wealth status		By wealth level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether chief taxed there								
Chief taxed here (*Local*)	-0.042***	-0.071**	-0.040**	-0.074	-0.056	-0.024	-0.056**	-0.120
	(0.016)	(0.034)	(0.017)	(0.054)	(0.045)	(0.024)	(0.022)	(0.076)
R^2	0.018	0.076	0.028	0.172	0.098	0.035	0.051	0.157
Observations	6267	1000	5267	446	554	2444	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	.663	.36	.72	.348	.372	.715	.725	.065
Panel B Comparing neighbourhoods by whether chief taxed anywhere								
Chief taxed elsewhere (*Central*)	-0.006	-0.039	-0.003	0.012	-0.099	0.045	-0.046	-0.091
	(0.023)	(0.053)	(0.026)	(0.081)	(0.074)	(0.034)	(0.031)	(0.114)
Chief taxed here (*Local*)	-0.045**	-0.090**	-0.042*	-0.068	-0.106*	0.001	-0.079***	-0.167*
	(0.020)	(0.043)	(0.022)	(0.064)	(0.059)	(0.031)	(0.028)	(0.098)
R^2	0.018	0.077	0.028	0.172	0.101	0.036	0.052	0.158
Observations	6267	1000	5267	446	554	2444	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	.668	.363	.727	.336	.388	.708	.744	.043
p-value test: collected *here* vs *elsewhere*	0.040	0.235	0.067	0.257	0.896	0.101	0.206	0.407

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets without adjusting for sampling weights. Specifically, Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using an index

of measures from the pre-specified wealth index without the application of the sampling weights described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.4 Effects of chief tax collection on targeting by wealth and assets – no sampling weights

Analysis:		By wealth status		By wealth level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether chief taxed there								
Chief taxed here (*Local*)	-0.041***	-0.051	-0.039**	-0.097*	-0.035	-0.028	-0.044*	-0.112
	(0.015)	(0.032)	(0.017)	(0.050)	(0.044)	(0.021)	(0.023)	(0.069)
R^2	0.019	0.072	0.028	0.171	0.092	0.038	0.049	0.149
Observations	6267	1057	5210	483	574	2543	2667	4384
Clusters	221	218	221	204	194	221	221	220
Control mean	.656	.346	.718	.359	.335	.723	.713	.056
Panel B Comparing neighbourhoods by whether chief taxed anywhere								
Chief taxed elsewhere (*Central*)	-0.025	-0.072	-0.010	-0.010	-0.139*	0.040	-0.059*	-0.194*
	(0.023)	(0.051)	(0.026)	(0.072)	(0.074)	(0.031)	(0.034)	(0.107)
Chief taxed here (*Local*)	-0.054***	-0.089**	-0.044**	-0.102*	-0.111*	-0.008	-0.075***	-0.213**
	(0.019)	(0.042)	(0.022)	(0.058)	(0.058)	(0.027)	(0.028)	(0.091)
R^2	0.020	0.075	0.028	0.171	0.099	0.039	0.051	0.152
Observations	6267	1057	5210	483	574	2543	2667	4384
Clusters	221	218	221	204	194	221	221	220
Control mean	.669	.36	.726	.346	.373	.715	.737	.088
p-value test: collected *here* vs *elsewhere*	0.140	0.668	0.112	0.162	0.629	0.053	0.568	0.815

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets without adjusting for sampling weights. Specifically, Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel

B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using an index of measures from the pre-specified wealth index, as well as individual indicators for possessing electricity, a vehicle, a fence and a roof of concrete, tiles or sheet iron (as opposed to thatch, straw or bamboo), without the application of the sampling weights described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.5 Error rate by components of wealth index

	Wall quality			Roof quality			Erosion threat			Road quality			Accessibility		
	Exclusion error	Inclusion error	Mean (ticket recipients)	Exclusion error	Inclusion error	Mean (ticket recipients)	Exclusion error	Inclusion error	Mean (ticket recipients)	Exclusion error	Inclusion error	Mean (ticket recipients)	Exclusion error	Inclusion error	Mean (ticket recipients)
Panel A Comparing neighbourhoods by whether local chief was tax collector there															
Chief taxed here (*Local*)	-0.009	-0.002	-0.005	-0.362*	-0.002	-0.089*	-0.054	-0.008	-0.042	-0.034	-0.006	-0.094	-0.040	-0.009	-0.134
	(0.024)	(0.006)	(0.048)	(0.193)	(0.006)	(0.049)	(0.038)	(0.007)	(0.081)	(0.043)	(0.007)	(0.086)	(0.027)	(0.007)	(0.087)
R^2	0.115	0.004	0.037	0.501	0.004	0.032	0.112	0.005	0.115	0.145	0.004	0.204	0.090	0.005	0.170
Observations	438	5714	4311	76	6077	4312	432	5835	4384	444	5823	4384	616	5651	4384
Clusters	116	221	220	50	221	220	137	221	220	106	221	220	141	221	220
Control mean	.873	.153	.038	.849	.151	.049	.898	.155	.009	.887	.154	.04	.902	.157	.059
Panel B Comparing neighbourhoods by whether local chief collected anywhere															
Chief taxed elsewhere (*Central*)	0.042	-0.011	-0.009	0.100	-0.006	-0.001	-0.067	-0.010	-0.142	-0.039	-0.008	0.043	-0.099***	-0.011	-0.161
	(0.048)	(0.009)	(0.060)	(0.250)	(0.009)	(0.045)	(0.055)	(0.009)	(0.125)	(0.042)	(0.010)	(0.125)	(0.032)	(0.010)	(0.130)
Chief taxed here (*Local*)	0.009	-0.008	-0.010	-0.283	-0.005	-0.090*	-0.088*	-0.013	-0.116	-0.057	-0.010	-0.071	-0.087***	-0.015*	-0.218*
	(0.028)	(0.008)	(0.051)	(0.235)	(0.007)	(0.046)	(0.045)	(0.008)	(0.105)	(0.043)	(0.008)	(0.113)	(0.027)	(0.008)	(0.111)
R^2	0.116	0.004	0.037	0.504	0.004	0.032	0.114	0.005	0.117	0.146	0.004	0.204	0.096	0.005	0.173
Observations	438	5714	4311	76	6077	4312	432	5835	4384	444	5823	4384	616	5651	4384
Clusters	116	221	220	50	221	220	137	221	220	106	221	220	141	221	220
Control mean	.886	.161	.044	.715	.156	.063	.911	.162	.024	.88	.158	.048	.911	.164	.09
p-value test *here* vs *elsewhere*	0.422	0.645	0.985	0.083	0.974	0.136	0.652	0.733	0.792	0.732	0.774	0.249	0.732	0.622	0.587

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Notes: This table compares the error rate in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category) (Panel A) and neighbourhoods where the chief taxed directly (*here*), where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) and did not collect taxes at all (excluded category) (Panel B). The outcomes are defined as errors of inclusion or exclusion using components of the house quality wealth index in Table 6.1.1, and sampling weights are applied. The outcomes are wall quality (Columns 1–3), roof quality (Columns 4–6), erosion threat (Columns 7–9), road quality (Columns 10–12) and accessibility (Columns 13–15). The first two Columns for each outcome are exclusion and inclusion error respectively, and the third Column is the mean difference in the outcome among ticket recipient households. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.6 Effects of chief tax collection on targeting by wealth – including control for neighbourhood mean

Analysis:		By wealth status		By wealth level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether chief taxed there								
Chief taxed here (*Local*)	-0.046***	-0.059***	-0.023**	-0.077**	-0.043	-0.013	-0.032**	-0.050**
	(0.016)	(0.021)	(0.009)	(0.038)	(0.030)	(0.013)	(0.013)	(0.020)
R^2	0.011	0.075	0.007	0.217	0.091	0.020	0.024	0.325
Observations	6267	1000	5267	446	554	2444	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	.317	.898	.163	.897	.899	.159	.166	.065
Panel B Comparing neighbourhoods by whether chief taxed anywhere								
Chief taxed elsewhere (*Central*)	-0.022	-0.008	-0.010	0.023	-0.024	0.023	-0.042**	-0.033
	(0.024)	(0.024)	(0.014)	(0.039)	(0.039)	(0.019)	(0.021)	(0.028)
Chief taxed here (*Local*)	-0.072***	-0.064***	-0.028**	-0.066	-0.056	-0.001	-0.054***	-0.082***
	(0.018)	(0.024)	(0.012)	(0.040)	(0.037)	(0.017)	(0.017)	(0.026)
R^2	0.032	0.075	0.008	0.217	0.092	0.021	0.026	0.331
Observations	6267	1000	5267	446	554	2444	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	.328	.897	.169	.891	.903	.157	.181	.041
p-value test: collected *here* vs *elsewhere*	0.019	0.027	0.120	0.052	0.364	0.123	0.463	0.039
Neighbourhood mean control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Notes: This table examines the robustness impact of chiefs collecting taxes on their allocation of cash transfer programme tickets presented in Table 6.1.1 by including in each regression a control for the leave-one-out neighbourhood mean of the pre-specified wealth index. The leave-one-out mean value for an individual observation is calculated as the average of the pre-specified wealth index among all other properties in the neighbourhood. Sampling weights are applied. Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using an index of measures from the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.7 Effects of chief tax collection on targeting by income – including control for neighbourhood mean

Analysis:		By income status		By income level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether chief was tax collector there								
Chief taxed here (*Local*)	-0.057**	-0.105*	-0.034	-0.130	-0.081	-0.011	-0.051*	-0.040
	(0.026)	(0.054)	(0.022)	(0.107)	(0.067)	(0.035)	(0.027)	(0.062)
R^2	0.030	0.169	0.026	0.308	0.295	0.067	0.049	0.135
Observations	2314	352	1963	128	224	954	1009	603
Clusters	220	213	221	128	181	220	221	206
Control mean	.337	.721	.268	.738	.712	.288	.249	.085
Panel B Comparing neighbourhoods by whether chief collected anywhere								
Chief taxed elsewhere (*Central*)	-0.068*	0.051	-0.059*	0.147	-0.009	-0.029	-0.084**	-0.146
	(0.037)	(0.078)	(0.031)	(0.156)	(0.097)	(0.053)	(0.036)	(0.098)
Chief taxed here (*Local*)	-0.093***	-0.080	-0.064**	-0.058	-0.085	-0.026	-0.094***	-0.111
	(0.034)	(0.064)	(0.028)	(0.126)	(0.075)	(0.044)	(0.034)	(0.084)
R^2	0.032	0.170	0.028	0.316	0.295	0.067	0.052	0.139
Observations	2314	352	1963	128	224	954	1009	603
Clusters	220	213	221	128	181	220	221	206
CompMean	.362	.700	.299	.697	.702	.293	.304	.019
p-value test: collected *here* vs *elsewhere*	0.395	0.054	0.813	0.145	0.407	0.949	0.728	0.632
Neighbourhood mean control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the robustness impact of chiefs collecting taxes on their allocation of cash transfer programme tickets presented in Table A3.2 by

including a control for the leave-one-out neighbourhood mean of the monthly income in each regression. In this table, errors are determined using the reported household monthly incomes. The leave-one-out mean value for an individual observation is calculated as the average of the monthly income among all other properties in the neighbourhood. Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the income measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the income distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average income level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.8 Targeting by wealth – fully-saturated model with cross-randomised treatments

Outcome (Sample):	Any error (Full sample)					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A Comparing neighbourhoods by whether chief taxed there						
Chief taxed here (*Local*)	-0.064***	-0.063***	-0.094***	-0.065***	-0.073***	-0.093***
	(0.017)	(0.;017)	(0.031)	(0.017)	(0.018)	(0.031)
R^2	0.031	0.032	0.032	0.032	0.032	0.035
Observations	6267	6267	6267	6267	6267	6267
Clusters	221	221	221	221	221	221
Control mean	0.317	0.317	0.317	0.317	0.317	0.317
Panel B Comparing neighbourhoods by whether chief taxed anywhere						
Chief taxed elsewhere (*Central*)	-0.022	-0.025	0.044	-0.021	-0.023	0.044
	(0.025)	(0.026)	(0.044)	(0.025)	(0.026)	(0.045)
Chief taxed here (*Local*)	-0.076***	-0.076***	-0.076**	-0.076***	-0.085***	-0.076**
	(0.019)	(0.019)	(0.033)	(0.019)	(0.021)	(0.033)
R^2	0.031	0.032	0.034	0.032	0.033	0.036
Observations	6267	6267	6267	6267	6267	6267
Clusters	221	221	221	221	221	221
Control mean	0.328	0.328	0.328	0.328	0.328	0.328
p-value test: tax *here* vs. *elsewhere*	0.017	0.029	0.006	0.014	0.007	0.006
Info/Coll. act. FE	No	Yes	Yes	No	No	Yes
Info/Coll. act. FE x chief taxed	No	No	Yes	No	No	Yes
Flyer FE	No	No	No	Yes	Yes	Yes
Flyer FE x chief taxed	No	No	No	No	Yes	Yes

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Notes: This table examines robustness tests for the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets. Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. The outcome considered is whether the chief committed any error (of exclusion or inclusion). Column 1 shows the preferred specification, including no additional controls. Column 2 includes dummies for the information and collective action cross-randomised arms. Column 3 adds interactions between the cross-randomised arm dummies and the Chief Taxed indicator. Column 4 includes a dummy for the flyer treatment. Column 5 adds interactions between the flyer dummy and the Chief Taxed indicator. Column 6 includes cross-randomised arm and flyer dummies and their interactions with the Chief Taxed indicator. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.9 Targeting by income – fully-saturated model with cross-randomised treatments

Outcome (Sample):	Any error (Full sample)					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A Comparing neighbourhoods by whether chief taxed there						
Chief taxed here (*Local*)	-0.0.44**	-0.046**	-0.130***	-0.043**	-0.050**	-0.129***
	(0.019)	(0.019)	(0.040)	(0.019)	(0.020)	(0.040)
R^2	0.022	0.023	0.027	0.023	0.024	0.029
Observations	2315	2315	2315	2315	2315	2315
Clusters	221	221	221	221	221	221
Control mean	0.337	0.337	0.337	0.337	0.337	0.337
Panel B Comparing neighbourhoods by whether chief taxed anywhere						
Chief taxed elsewhere (*Central*)	-0.049*	-0.046*	-0.078	-0.048*	-0.051*	-0.078
	(0.027)	(0.026)	(0.054)	(0.027)	(0.027)	(0.054)
Chief taxed here (*Local*)	-0.070***	-0.070***	-0.167***	-0.068***	-0.077***	-0.166***
	(0.024)	(0.024)	(0.043)	(0.024)	(0.025)	(0.043)
R^2	0.023	0.024	0.028	0.024	0.025	0.043
Observations	2315	2315	2315	2315	2315	2315
Clusters	221	221	221	221	221	221
Control mean	0.362	0.362	0.362	0.362	0.362	0.362
p-value test: tax *here* vs. *elsewhere*	0.350	0.293	0.097	0.383	0.263	0.099
Info/Coll. act. FE	No	Yes	Yes	No	No	Yes
Info/Coll. act. FE x chief taxed	No	No	Yes	No	No	Yes
Flyer FE	No	No	No	Yes	Yes	Yes
Flyer FE x chief taxed	No	No	No	No	Yes	Yes

Sources: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines robustness tests for the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets. Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using the reported household monthly incomes. The outcome considered is whether the chief committed any error (of exclusion or inclusion). Column 1 shows the preferred specification, including no additional controls. Column 2 includes dummies for the information and collective action cross-randomised arms. Column 3 adds interactions between the cross-randomised arm dummies and the Chief Taxed indicator. Column 4 includes a dummy for the flyer treatment. Column 5 adds interactions between the flyer dummy and the Chief Taxed indicator. Column 6 includes cross-randomised arm and flyer dummies and their interactions with the Chief Taxed indicator. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.10 Targeting by wealth – controlling for chief characteristics

Analysis:		By wealth status		By wealth level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether chief taxed there								
Chief taxed here (*Local*)	-0.065***	-0.056***	-0.017**	-0.081*	-0.040	-0.014	-0.036***	-0.138*
	(0.017)	(0.020)	(0.007)	(0.041)	(0.030)	(0.012)	(0.012)	(0.075)
R^2	0.033	0.080	0.007	0.222	0.111	0.024	0.030	0.173
Observations	6267	1002	5265	446	556	2442	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.317	0.898	0.163	0.897	0.899	0.159	0.166	0.065
Controls for chief characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B Comparing neighbourhoods by whether chief taxed anywhere								
Chief taxed elsewhere (*Central*)	-0.032	-0.012	-0.018	0.038	-0.092**	-0.004	-0.038*	-0.096
	(0.026)	(0.023)	(0.012)	(0.051)	(0.040)	(0.017)	(0.022)	(0.113)
Chief taxed here (*Local*)	-0.082***	-0.063**	-0.026***	-0.062	-0.090**	-0.016	-0.056***	-0.189**
	(0.020)	(0.024)	(0.010)	(0.045)	(0.039)	(0.017)	(0.016)	(0.095)
R^2	0.033	0.080	0.007	0.223	0.116	0.024	0.031	0.174
Observations	6267	1002	5265	446	556	2442	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.328	0.897	0.169	0.891	0.903	0.157	0.181	0.041
p-value test: collected *here* vs *elsewhere*	0.025	0.020	0.376	0.054	0.964	0.375	0.275	0.317
Controls for chief characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Notes: This table examines the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets, controlling for the characteristics of the local chief. Specifically, Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include controls for chief characteristics including for the chief's age, education level, number of possessions, trust in government, tribal affiliation, years spent as chief and whether they are an avenue chief.[75] When including these controls, we replace missing values in control variables with the mean for the entire sample and include a separate dummy (for each control variable) for the missing value. All regressions also include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

[75] The wealth index is composed of observed property characteristics, as described in Section 4.3.

Table A3.11 Targeting by income – controlling for chief characteristics

Analysis:		By income status		By income level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Comparing neighbourhoods by whether chief taxed there								
Chief taxed here (*Local*)	-0.046**	-0.108**	-0.031	-0.192	-0.081	-0.010	-0.056**	-0.011
	(0.019)	(0.054)	(0.021)	(0.117)	(0.070)	(0.029)	(0.027)	(0.059)
R^2	0.024	0.192	0.032	0.398	0.318	0.078	0.052	0.153
Observations	2315	352	1963	128	224	954	1009	604
Clusters	221	213	221	128	181	220	221	207
Control mean	0.337	0.721	0.268	0.738	0.712	0.288	0.249	0.085
Controls for chief characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B Comparing neighbourhoods by whether chief taxed anywhere								
Chief taxed elsewhere (*Central*)	-0.055*	0.041	-0.062**	0.169	-0.045	-0.029	-0.090**	-0.102
	(0.028)	(0.079)	(0.030)	(0.175)	(0.102)	(0.044)	(0.037)	(0.097)
Chief taxed here (*Local*)	-0.074***	-0.088	-0.064**	-0.105	-0.101	-0.025	-0.103***	-0.064
	(0.025)	(0.067)	(0.028)	(0.141)	(0.081)	(0.038)	(0.034)	(0.077)
	(0.020)	(0.024)	(0.010)	(0.045)	(0.039)	(0.017)	(0.016)	(0.095)
R^2	0.025	0.192	0.034	0.407	0.318	0.079	0.056	0.155
Observations	2315	352	1963	128	224	954	1009	604
Clusters	221	213	221	128	181	220	221	207
Control mean	0.362	0.700	0.299	0.697	0.702	0.293	0.304	0.019
p-value test: collected *here* vs *elsewhere*	0.387	0.054	0.929	0.069	0.536	0.914	0.676	0.615
Controls for chief characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets, controlling for the characteristics of the local chief. Specifically, Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using the reported household monthly incomes. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the income measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the income distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average income level among programme ticket recipients. All regressions include controls for chief characteristics including for the chief's age, education level, number of possessions, trust in government, tribal affiliation, years spent as chief and whether they are an avenue chief. When including these controls, we replace missing values in control variables with the mean for the entire sample and include a separate dummy (for each control variable) for the value being missing. All regressions also include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.12 Targeting by wealth – including controls, pilot neighbourhoods, excluding misassigned neighbourhood, and top-coding

Outcome (Sample):	Any error (Full sample)					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A Comparing neighbourhoods by whether chief taxed there						
Chief taxed here (*Local*)	-0.060***	-0.067***	-0.064***	-0.042***	-0.064***	-0.033**
	(0.017)	(0.017)	(0.017)	(0.016)	(0.017)	(0.015)
R^2	0.039	0.044	0.048	0.018	0.031	0.301
Observations	6267	6267	6267	6267	6249	221
Clusters	221	221	221	221	220	
Control mean	0.317	0.317	0.317	0.317	0.317	0.283
Panel B Comparing neighbourhoods by whether chief taxed anywhere						
Chief taxed elsewhere (*Central*)	-0.020	-0.018	-0.013	-0.006	-0.022	-0.012
	(0.026)	(0.024)	(0.025)	(0.023)	(0.025)	(0.022)
Chief taxed here (*Local*)	-0.071***	-0.077***	-0.071***	-0.045**	-0.076***	-0.039**
	(0.019)	(0.019)	(0.020)	(0.020)	(0.019)	(0.019)
R^2	0.039	0.044	0.048	0.018	0.031	0.303
Observations	6267	6267	6267	6267	6249	221
Clusters	221	221	221	221	220	
Control mean	0.328	0.328	0.328	0.328	0.328	0.289
p-value test: tax *here* vs. *elsewhere*	0.017	0.029	0.006	0.014	0.007	0.006
Controls						
Age, age^2, sex, education	Yes	Yes	Yes	No	No	No
Distance to schools	No	Yes	Yes	No	No	No
Employed, salaried	No	No	Yes	No	No	No
Government job (self and family)	No	No	Yes	No	No	No
Majority tribe	No	No	Yes	No	No	No
Adjustments						
Includes pilot neighbourhoods	No	No	No	Yes	No	No
Excludes misassigned neighbourhoods	No	No	No	No	Yes	No
Top- and bottom-code 10% neighbourhoods	No	No	No	No	No	Yes

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines robustness tests for the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets. Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to

neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. The outcome considered is whether the chief committed any error (of exclusion or inclusion). Column 1 includes controls for age, age-squared and gender. Column 2 controls for distance from schools. Column 3 adds controls for having any job, a salaried job or a government job, a family member with a government job, and belonging to the majority tribe. When including controls, we replace missing values in control variables with the mean for the entire sample and include a separate dummy (for each control variable) for the value being missing. Column 4 includes pilot neighbourhoods, with time period and stratum values that reflect its implementation several months before the campaign and in a remote neighbourhood. Column 5 excludes the neighbourhood misassigned during the tax campaign (see Balán *et al.* [2022] for a discussion). Column 6 displays estimates from a regression on mean outcomes at the neighbourhood level, winsorizing the top and bottom ten per cent of neighbourhoods and using robust standard errors. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.13 Targeting by income – including controls, pilot neighbourhoods, excluding misassigned neighbourhood, and top-coding

Outcome (Sample):	Any error (Full sample)					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A Comparing neighbourhoods by whether chief taxed there						
Chief taxed here (*Local*)	-0.044**	-0.043**	-0.045**	-0.044**	-0.044**	-0.044
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.058)
R^2	0.027	0.027	0.034	0.022	0.022	0.231
Observations	2315	2315	2315	2315	2309	213
Clusters	221	221	221	221	220	
Control mean	0.337	0.337	0.337	0.337	0.337	0.551
Panel B Comparing neighbourhoods by whether chief taxed anywhere						
Chief taxed elsewhere (*Central*)	-0.048*	-0.048*	-0.042	-0.049*	-0.049*	0.030
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.085)
Chief taxed here (*Local*)	-0.069***	-0.068***	-0.066***	-0.070***	-0.069***	-0.029
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.073)
R^2	0.028	0.028	0.034	0.023	0.023	0.232
Observations	2315	2315	2315	2315	2309	213
Clusters	221	221	221	221	220	
Control mean	0.362	0.362	0.362	0.362	0.362	0.557
p-value test: tax *here* vs. *elsewhere*	0.361	0.380	0.278	0.350	0.355	0.411
Controls						
Age, age^2, sex, education	Yes	Yes	Yes	No	No	No
Distance to schools	No	Yes	Yes	No	No	No
Employed, salaried	No	No	Yes	No	No	No
Government job (self and family)	No	No	Yes	No	No	No
Majority tribe	No	No	Yes	No	No	No
Adjustments						
Includes pilot neighbourhoods	No	No	No	Yes	No	No
Excludes misassigned neighbourhoods	No	No	No	No	Yes	No
Top- and bottom-code 10% neighbourhoods	No	No	No	No	No	Yes

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines robustness tests for the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets. Panel A compares error rates in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) to

neighbourhoods where the chief did not collect taxes at all (excluded category). In this table, errors are determined using the reported household monthly incomes. The outcome considered is whether the chief committed any error (of exclusion or inclusion). Column 1 includes controls for age, age-squared and gender. Column 2 controls for distance from schools. Column 3 adds controls for having any job, a salaried job or a government job, a family member with a government job, and belonging to the majority tribe. When including controls, we replace missing values in control variables with the mean for the entire sample and include a separate dummy (for each control variable) for the missing value. Column 4 includes pilot neighbourhoods, with time period and stratum values that reflect its implementation several months before the campaign and in a remote neighbourhood. Column 5 excludes the neighbourhood misassigned during the tax campaign (see Balán *et al.* [2022]) for a discussion). Column 6 displays estimates from a regression on mean outcomes at the neighbourhood level, winsorizing the top and bottom ten per cent of neighbourhoods and using robust standard errors. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

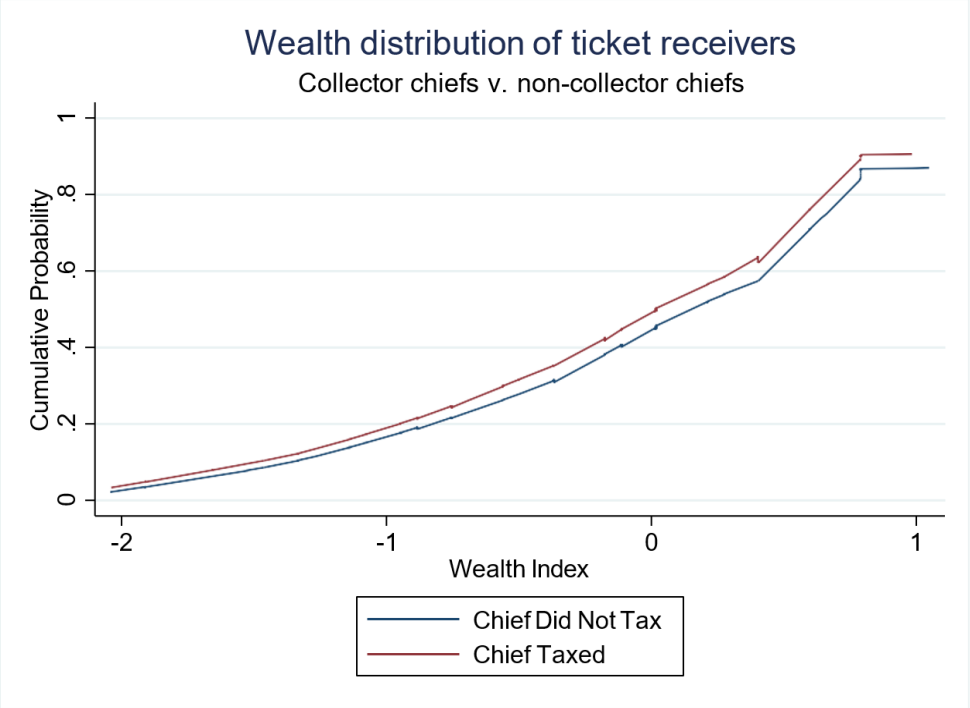
Table A3.14 Equality of distribution tests: wealth index and monthly household income

	Pooled Quality	Monthly Income
Panel A: Kolmogorov-Smirnov test		
Chief taxed vs did not tax	0.000	0.259
Het: Chief taxed *here* vs did not tax	0.068	0.149
Het: Chief taxed *elsewhere* vs did not tax	0.244	0.643
Het: Chief taxed *here* vs *elsewhere*	0.000	0.892
Panel B: Wilcoxon rank sum test		
Chief taxed vs did not tax	0.046	0.749
Het: Chief taxed *here* vs did not tax	0.073	0.278
Het: Chief taxed *elsewhere* vs did not tax	0.773	0.342
Het: Chief taxed *here* vs *elsewhere*	0.150	0.676

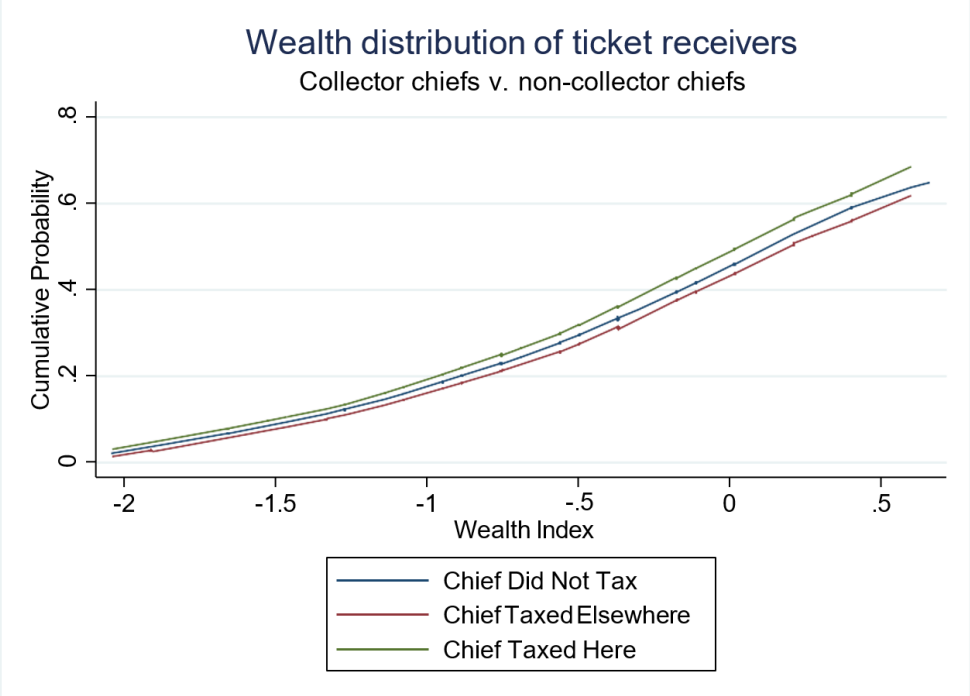
Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table summarises the results of two tests of the equality of distributions. Panel A reports the p-values of the Kolmogorov-Smirnov test. Panel B reports the p-values of the Wilcoxon rank sum test, and data is clustered by neighbourhood. In each panel, Row 1 compares the wealth characteristic distribution of the neighbourhoods where the chief taxed with those where the chief did not tax. Row 2 compares the distribution of the neighbourhoods where the chief taxed directly (*here*) with those where the chief did not collect taxes at all. Row 3 compares the distribution of the neighbourhoods where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) with those where the chief did not collect taxes at all. Row 4 compares the distribution of the neighbourhoods where the chief taxed directly (*here*) with those where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*). Each column corresponds to a characteristic of ticket recipients. Column 1 is the pooled quality (wealth) index, which is a standardised index including wall quality, erosion threat, road quality and accessibility. Column 2 is monthly income. We discuss these results in Section 6.1.

Figure A3.2 Distributions of wealth index

A: By chief taxed neighbourhood directly



B: By location of chief tax collection

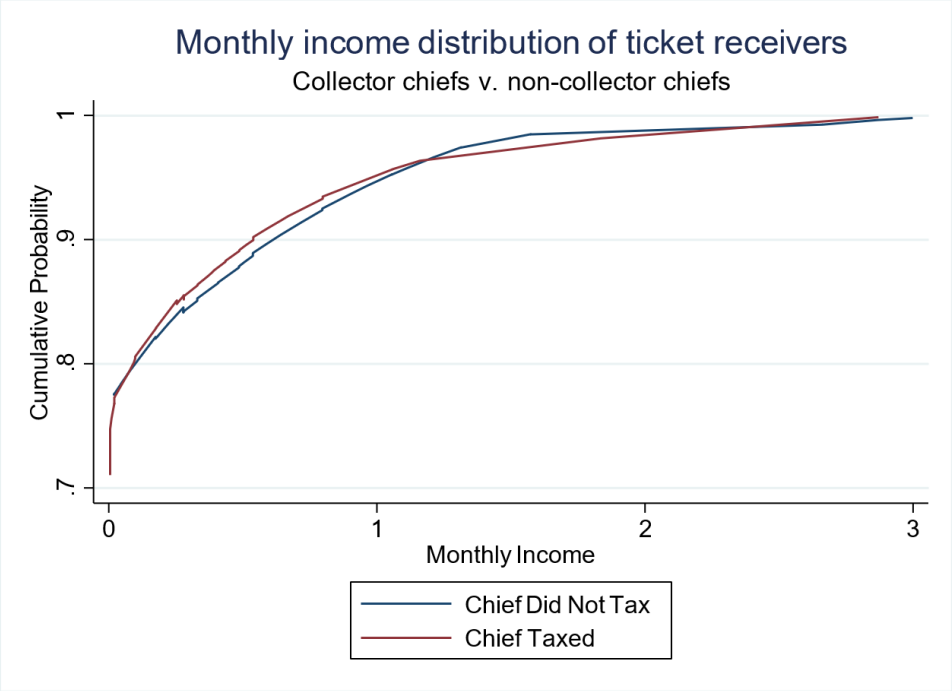


Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This figure shows the cumulative distribution functions of the house quality index of ticket recipients. The measure is a standardised index including wall quality, erosion threat, road quality and accessibility. Panel A

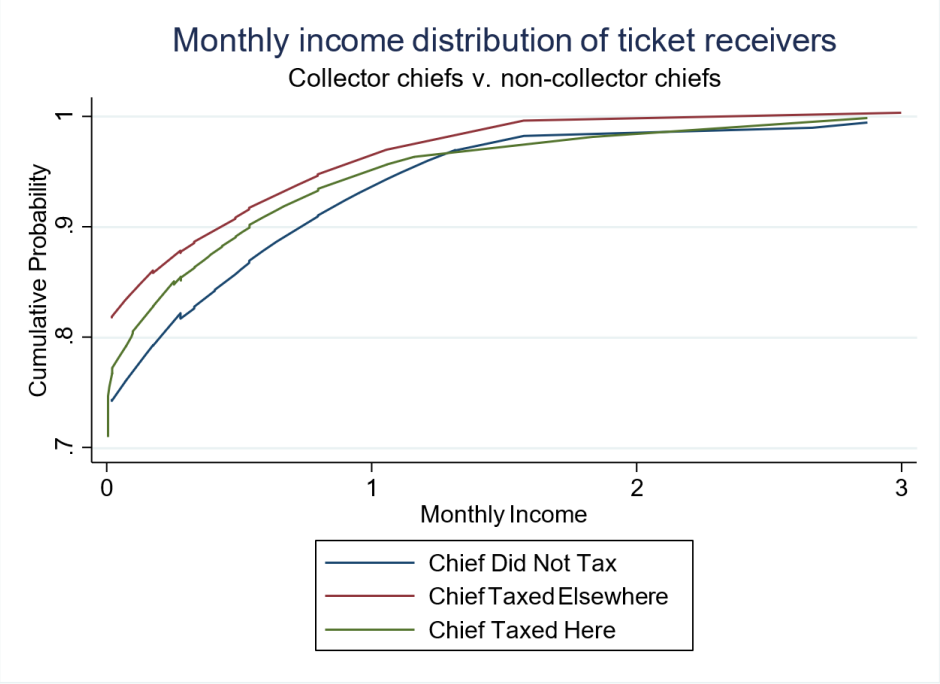
compares the distributions for the neighbourhoods where the chief taxed and for those where the chief did not tax. Panel B compares the distributions for the neighbourhoods where the chief taxed directly (*here*), for those where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) and for those where the chief did not collect taxes at all. We discuss these results in Section 6.1.

Figure A3.3 Distributions of monthly household income

A: By chief taxed neighbourhood directly



B: By location of chief tax collection



Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This figure shows the cumulative distribution functions of the monthly income of ticket recipients. Panel A

compares the distributions for the neighbourhoods where the chief taxed and for those where the chief did not tax. Panel B compares the distributions for the neighbourhoods where the chief taxed directly (*here*), for those where the local chief did not collect taxes directly but collected taxes in another neighbourhood (*elsewhere*) and for those where the chief did not collect taxes at all. We discuss these results in Section 6.1.

Table A3.15 Effects of chief tax collection on targeting by citizen preferences – including control for neighbourhood wealth mean

Analysis:		By wealth status		By wealth level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Citizen preferences for poor								
Chief taxed here (*Local*)	0.035	0.061	0.049	0.037	0.115	0.020	0.046	0.007
	(0.047)	(0.068)	(0.029)	(0.096)	(0.087)	(0.040	(0.037)	(0.067)
Citizen preference for poor	0.052	-0.019	0.070*	-0.038	-0.013	-0.021	-0.082	-0.067
	(0.079)	(0.110)	(0.050)	(0.167)	(0.138)	(0.068)	(0.064)	(0.107)
Chief taxed *here* x citizen preference for poor	-0.176**	-0.215*	-0.134***	-0.223	-0.263*	-0.062	-0.143**	-0.129
	(0.079)	(0.110)	(0.050)	(0.167)	(0.138)	(0.068)	(0.064)	(0.107)
R^2	0.033	0.082	0.009	0.224	0.101	0.021	0.026	0.332
Observations	6267	1002	5265	446	556	2442	2823	4385
Clusters	221	216	221	193	195	218	221	220
Control mean	0.317	0.898	0.163	0.897	0.899	0.159	0.166	0.065
Panel B Citizen egalitarian preferences								
Chief taxed *here* (i)	-0.154***	-0.181***	-0.077***	0.218***	0.178**	0.001	-0.099***	-0.214***
	(0.038)	(0.050)	(0.23)	(0.079)	(0.084)	(0.03)	(0.036)	(0.048)
Citizen egalitarian preference	-0.110**	-0.093	-0.062*	-0.081	-.158	0.048	-0.100*	-0.170**
	(0.053)	(0.062)	(0.033)	(0.086)	(0.110)	(0.052)	(0.056)	(0.073)
Chief taxed *here* x citizen egalitarian preference	0.185**	0.251**	0.108**	0.286**	0.274*	-0.024	0.132*	0.305***
	(0.075)	(0.099)	(0.044)	(0.141)	(0.161)	(0.066)	(0.067)	(0.099)
R^2	0.033	0.080	0.008	0.223	0.095	0.021	0.026	0.332
Observations	6267	1002	5265	446	556	2442	2823	4385

Clusters	221	216	221	193	195	218	221	220
Control mean	0.317	0.898	0.163	0.897	0.899	0.159	0.166	0.065

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the robustness to heterogeneity in the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets by citizens' preferences presented in Table 6.1.2 by including in each regression a control for the leave-one-out neighbourhood mean of the pre-specified wealth index. The leave-one-out mean value for an individual observation is calculated as the average of the pre-specified wealth index among all other properties in the neighbourhood. Panel A considers citizens' preferences that the government prioritise the poor, and Panel B considers citizens' preferences that the government prioritise equally (i.e. egalitarian). Values for the citizen preference variables are continuous and are computed as the share of citizens in a neighbourhood reporting a particular preference. These preferences were solicited after the tax campaign but before ticket distribution. In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Table A3.16 Effects of chief tax collection on targeting by citizen preferences – including control for neighbourhood wealth variance

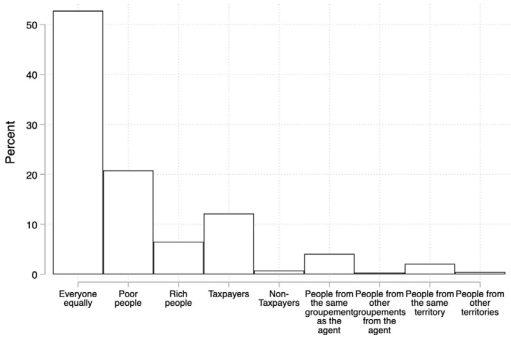
Analysis:		By wealth status		By wealth level				
Outcome:	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
Sample:	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Citizen preferences for poor								
Chief taxed here (*Local*)	0.037	0.061	0.039	0.042	0.109	0.023	0.047	-0.168
	(0.047)	(0.067)	(0.024)	(0.095)	(0.085)	(0.038)	(0.037)	(0.245)
Citizen preference for poor	0.056	-0.017	0.052*	-0.034	-0.014	0.027	0.084	-0.456
	(0.058)	(0.064)	(0.031)	(0.091)	(0.088)	(0.054)	(0.053)	(0.308)
Chief taxed here x citizen preference for poor	-0.179**	-0.214**	-0.108**	-0.225	-0.255*	-0.065	-0.145**	0.146
	(0.078)	(0.108)	(0.042)	(0.166)	(0.135)	(0.066)	(0.064)	(0.408)
R^2	0.033	0.080	0.007	0.223	0.097	0.020	0.026	0.173
Observations	6267	1002	5265	446	556	2442	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.317	0.898	0.163	0.897	0.899	0.159	0.166	0.065
Panel B Citizen egalitarian preferences								
Chief taxed here (*Local*)	-0.154***	0.178***	-0.062***	-0.215***	0.174**	-0.002	-0.098***	-0.282
	(0.038)	(0.049)	(0.020)	(0.078)	(0.083)	(0.032)	(0.036)	(0.173)
Citizen egalitarian preference	-0.113**	-0.091	-0.052*	-0.084	-0.155	0.040	-0.097*	-0.264
	(0.052)	(0.060)	(0.028)	(0.085)	(0.108)	(0.051)	(0.056)	(0.277)
Chief taxed here x citizen egalitarian preference	0.188**	0.247**	0.087**	0.287**	0.263*	-0.016	0.131*	0.386
	(0.074)	(0.096)	(0.037)	(0.140)	(0.158)	(0.063)	(0.067)	(0.344)
R^2	0.003	0.078	0.006	0.223	0.092	0.020	0.026	0.170
Observations	6267	1002	5265	446	556	2442	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.317	0.898	0.163	0.897	0.899	0.159	0.166	0.065

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

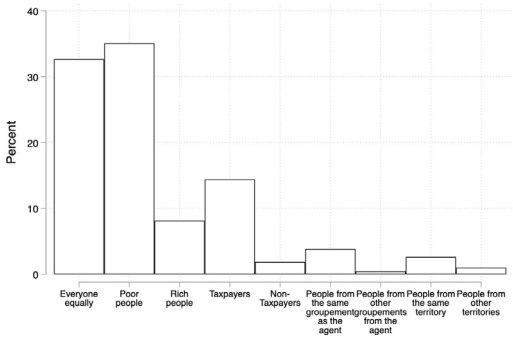
Notes: This table examines the robustness to heterogeneity in the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets by citizens' preferences presented in Table 6.1.2 by including in each regression a control for the leave-one-out neighbourhood variance of the pre-specified wealth index. The leave-one-out variance value for an individual observation is calculated as the variance of the pre-specified wealth index among all other properties in the neighbourhood. Panel A considers citizens' preferences that the government prioritise the poor, and Panel B considers citizens' preferences that the government prioritise equally (i.e. egalitarian). Values for the citizen preference variables are continuous and computed as the share of citizens in a neighbourhood reporting a particular preference. These preferences were solicited after the tax campaign but before ticket distribution. In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 6.1.

Figure A3.4 Citizen preferences for targeting by quartile of pro-poor preferences per neighbourhood

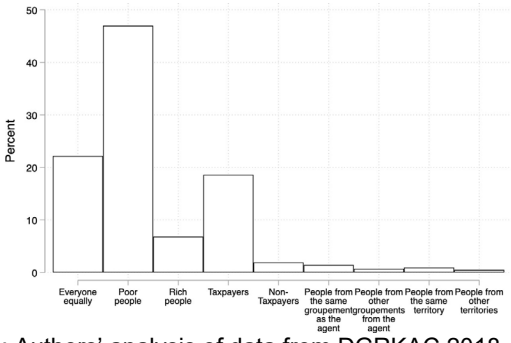
A: First quartile



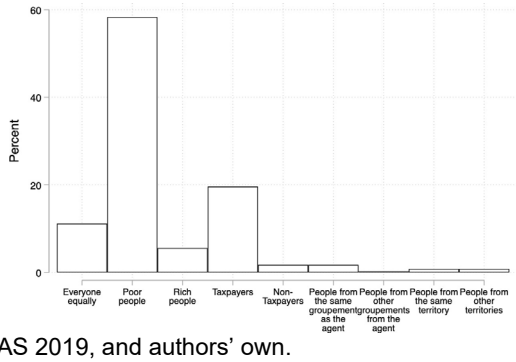
B: Second quartile



C: Third quartile



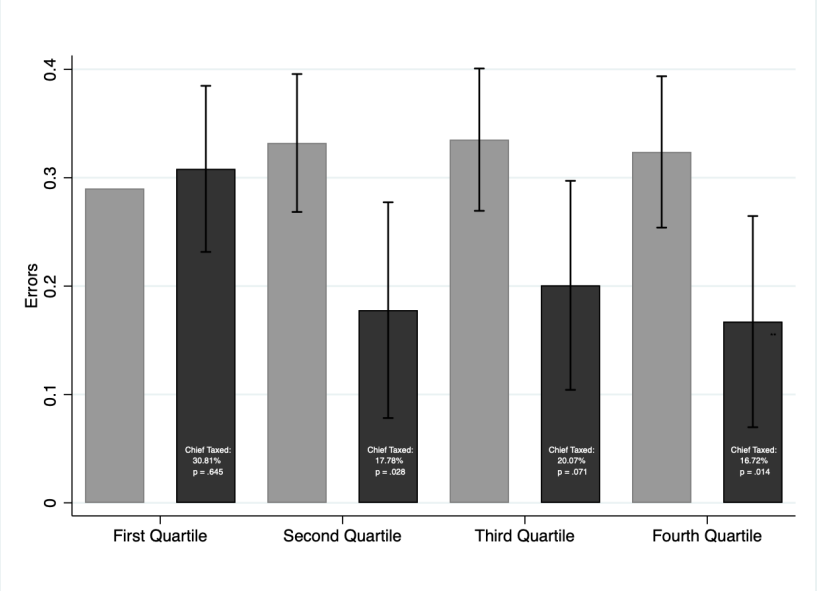
D: Fourth quartile



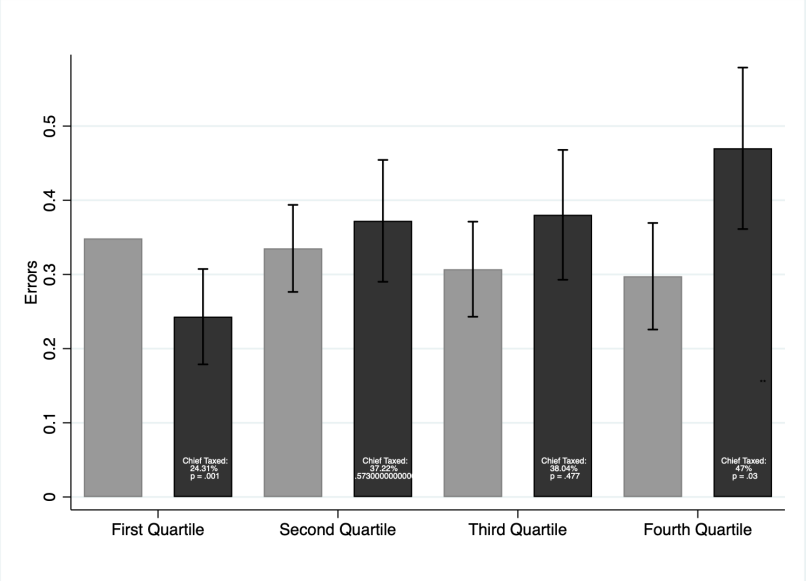
Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This figure summarises citizen preferences for the allocation of cash transfers, organised by quartiles of the distribution of citizens who prefer pro-poor allocation per neighbourhood. We discuss these results in Section 6.1.

Figure A3.5 Errors by citizen preferences for targeting

A: Citizen preferences for poor



B: Citizen egalitarian preferences



Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This figure compares the total errors in neighbourhoods where the chiefs did (black) and did not (grey) tax by quartiles of the distribution of citizen preferences for targeting poor households (Panel A) and everyone equally (Panel B). We discuss these results in Section 6.1.

Appendix 4 Exhibits from Section 7

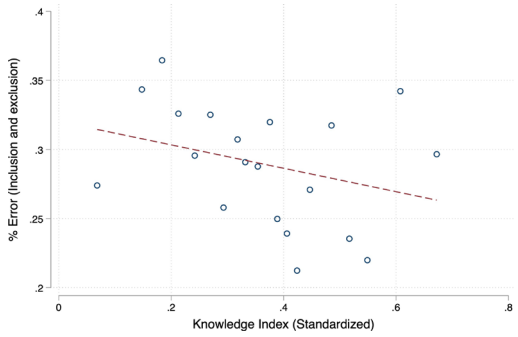
Table A4.1 Citizen perceptions of chiefs' information

	House location	Paid tax in 2018	Occupation	Earnings per month	Index
	(1)	(2)	(3)	(4)	(5)
Panel A: Comparing neighbourhoods by whether chief taxed there					
Chief taxed here (*Local*)	0.030	0.344***	0.095*	0.104*	0.208***
	(0.053)	(0.057)	(0.057)	(0.055)	(0.057)
R^2	0.085	0.098	0.065	0.043	0.080
Observations	2332	2144	2334	2333`	2361
Clusters	221	221	221	221	221
Control Mean	.015	.15	.041	.032	.074
Panel B: Comparing neighbourhoods by whether chief taxed anywhere					
Chief taxed elsewhere (*Central*)	0.096	0.260***	0.112	0.017	0.176**
	(0.082)	(0.080)	(0.085)	(0.072)	(0.078)
Chief taxed here (*Local*)	0.080	0.482***	0.154**	0.113*	0.300***
	(0.068)	(0.069)	(0.072)	(0.066)	(0.069)
R^2	0.086	0.105	0.066	0.043	0.083
Observations	2332	2144	2334	2333	2361
Clusters	221	221	221	221	221
Control Mean	.016	.264	.09	.031	.143
p-value test: tax *here* vs. *elsewhere*	0.805	0.001	0.548	0.151	0.069

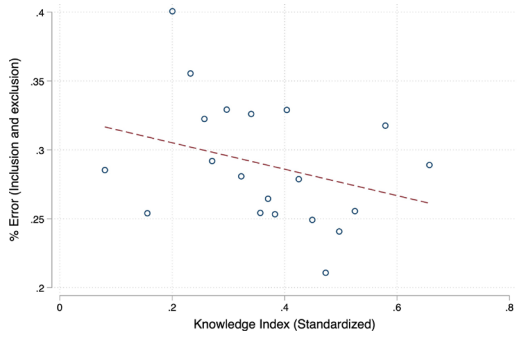
Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the impact of chiefs collecting taxes on citizen perceptions of the information chiefs possess about households. Specifically, Panel A compares citizen-reported knowledge differences in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category), and Panel B compares neighbourhoods where the chief taxed directly (*here*) and where the local chief did not collect taxes directly but collected taxes in another neighbourhood (elsewhere) to neighbourhoods where the chief did not collect taxes at all (excluded category). Measures of the chief's perceived knowledge were collected after the 2018 taxation campaign and before the anti-poverty programme, and pertain to a citizen's house location (Column 1), whether they paid the property tax in 2018 (Column 2), what they do for a living (Column 3), earnings per month (Column 4) and an index of all measures. Each measure was collected as a 1 to 4 Likert scale, increasing in certainty in the chief's knowledge. All regressions use standardised measures of these variables and include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 7.1.

Figure A4.1 Error rate by chief knowledge of the inhabitants of the neighbourhood

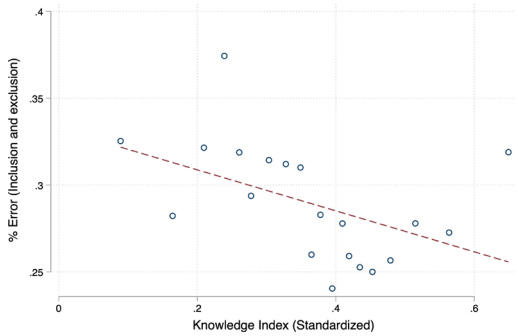
Panel A: No controls



Panel B: Chief controls



Panel C: Chief and neighbourhood controls



Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This figure shows the relationship between chiefs' knowledge of the inhabitants of the neighbourhood and the average error rate in the neighbourhood. The error rate is defined using a pre-registered wealth index constructed from observable household attributes and estimated on sample-weighted data, as described in Section 4.2. A chief's knowledge of the inhabitants of the neighbourhood is measured as the standardised score of correctly answered questions about the name, education level and occupation of a randomly selected group of 12 property owners per neighbourhood. All figures are neighbourhood-level binned scatterplots. Panel A of Table 7.1.2 analyses these relationships in a regression framework. We discuss these results in Section 7.1.

Table A4.2 Chief financial contributions to programme in neighbourhood

	Contribution > 0	Contribution amount
	(1)	(2)
Chief taxed here (*Local*)	-0.066	-57.656
	(0.063)	(51.178)
R^2	0.340	0.264
Observations	200	200
Control mean	.786	395.146

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the impact of chiefs collecting taxes on their willingness to contribute a share of their transportation stipend to the pot of funds intended for distribution in their neighbourhood. Chiefs made this decision for each neighbourhood in their jurisdiction. All regressions include tax stratum fixed effects and robust standard errors. We discuss these results in Section 6.1.

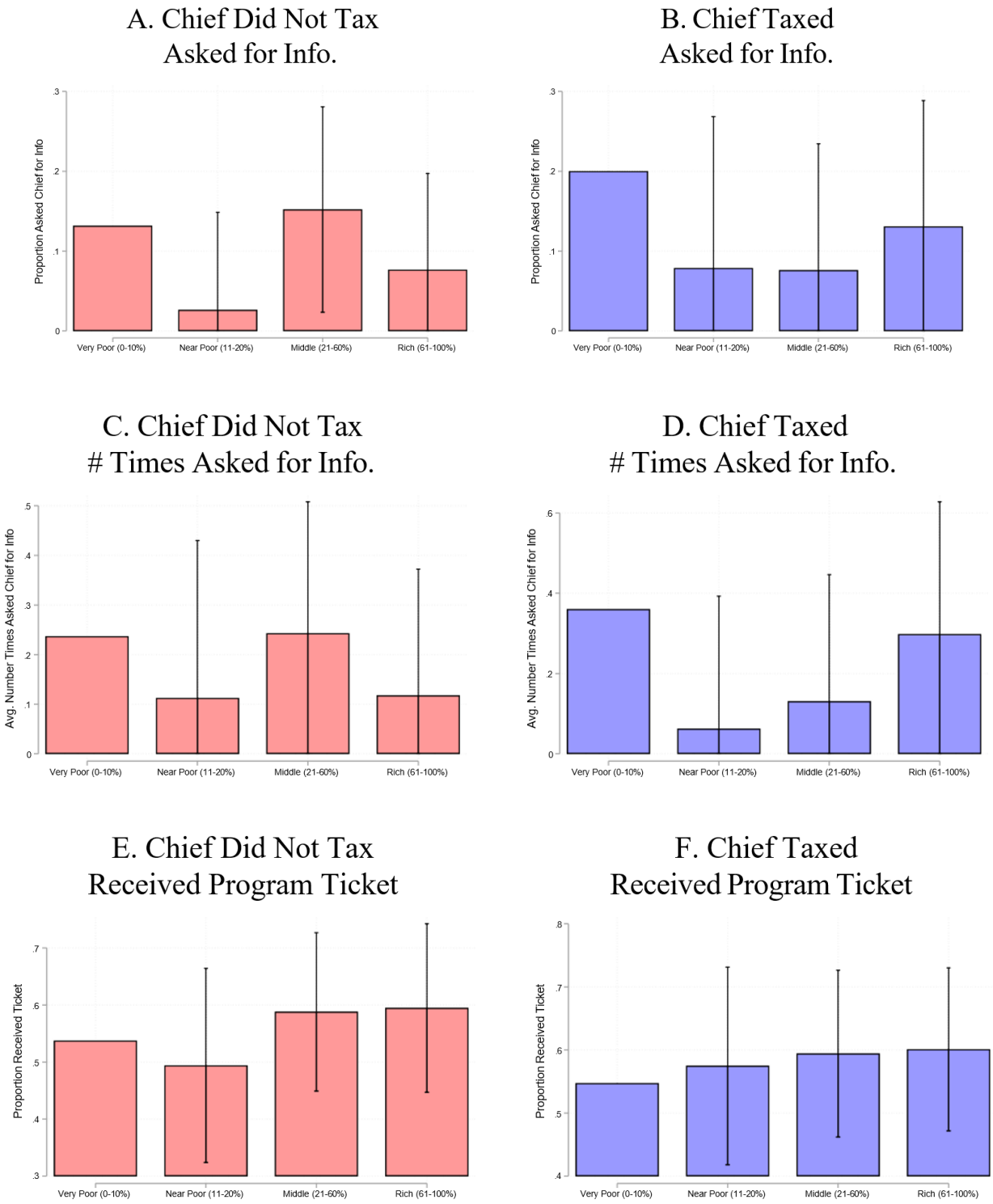
Table A4.3 *Salongo* participation

Dependent variable	$\hat{\beta}$	SE	R^2	N	$\bar{x}$ ChiefNotTax
	(1)	(2)	(3)	(4)	(5)
Panel A: Contributions to *salongo*					
Any contribution to *salongo*	-0.007	0.028	0.066	2380	0.404
Hours contributed to *salongo*	1.263	0.853	0.069	903	10.187
Panel B: Views of *salongo*					
Fairness of *salongo*	0.013	0.051	0.034	2376	-0.007
Importance of *salongo*	-0.024	0.059	0.043	2380	0.004
Obligation to do *salongo*	-0.028	0.068	0.059	2380	0.008
Obligation for taxpayers	-0.041	0.072	0.048	2380	0.018
Obligation for nonpayers	-0.062	0.076	0.062	2380	0.028
Panel C: Incidence of *salongo*					
Who contributes - men not women	-0.008	0.060	0.046	2380	0
Who contributes - poor not rich	0.003	0.063	0.042	2380	0.008
Panel D: Sanctions for non-contributors to *salongo*					
Likelihood of sanctions for non-contributors	0.030	0.047	0.052	2380	-0.018
Severity of sanctions for non-contributors	0.020	0.047	0.048	2380	-0.012

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table compares *salongo* participation in neighbourhoods where the chief taxed with those where the chief did not tax (the excluded category). Each row summarises an OLS estimation of equation (1), comparing neighbourhoods where chiefs taxed to those where they did not, with the dependent variable in the first column. The Column header $\hat{\beta}$ is the coefficient on the treatment indicator, followed by the cluster-robust standard error, R^2, number of observations and the excluded group mean $\bar{x}_{ChiefNotTax}$. Panel A shows estimated differences in citizen-reported contributions to *salongo* on the extensive margin (an indicator for participating in *salongo* in the past month) and on the intensive margin (the number of hours contributed to *salongo* in the past month). Panel B shows estimated differences in citizens' reported views of *salongo*, including whether (1) it is

fair that a household must contribute to *salongo*, (2) *salongo* is important for the development of the neighbourhood, (3) *salongo* is an obligation for all households in the neighbourhood, (4) *salongo* is an obligation for households who paid the property tax this year and (5) *salongo* is an obligation for households who did not pay the property tax this year. Panel C shows estimated differences in the perceived incidence of *salongo*, including whether (1) women are more solicited for *salongo* than men and (2) poor rather than rich households are more solicited for *salongo*. Panel D reports estimated differences in households' perceived sanctions for non-contribution to *salongo*, both in terms of the likelihood and severity of sanctions. We discuss these results in Section 7.2.

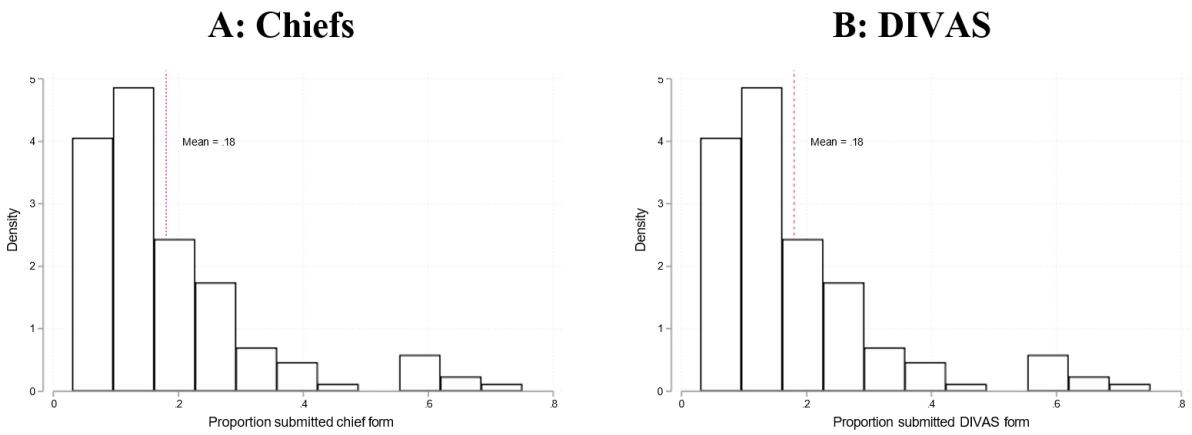
Figure A4.2 Asking chief for information and receiving programme ticket by wealth status



Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This figure shows levels of engagement with the chief for the measures described in Table 7.2.1 by

household wealth groups. These measures include the likelihood of asking the chief for information about the programme (Panels A and B), the number of times asked (Panels C and D) and whether a household received a programme ticket (Panels E and F) separately by whether a chief collected taxes (in blue: Panels B, D and F) or not (in red: Panels A, C and E). The figure in each panel plots the mean level of the outcome across wealth groups. Vertical bars represent 95 per cent confidence intervals and are truncated at zero for readability. We discuss these results in Section 7.3.

Figure A4.3 Audit form submission rates by neighbourhood



Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This figure shows the distributions of rates of audit form submission at the neighbourhood level for neighbourhoods in the *Audit* arm. Panel A shows the distribution of the rate of submission for requesting audit meetings for chiefs, and Panel B shows the distribution of the rate of submission for DIVAS. We discuss this table in Section 7.3.

Table A4.4 Effects of chief tax collection and cross-randomised treatments on corruption

	Asked something for ticket	Cash not in envelope	Chief stole cash	Amt. cash stolen (FC)
Chief taxed	-0.002	-0.006	0.043	319.220
	(0.011)	(0.077)	(0.108)	(1133.916)
Chief taxed X *Info* + *Audit*	-0.006	0.007	0.082	808.888
	(0.032)	(0.080)	(0.129)	(1361.240)
Info + Audit	0.031	-0.054	-0.028	-751.999
	(0.028)	(0.068)	(0.079)	(890.015)
Chief taxed X *Info*	-0.004	-0.079	-0.151	-1746.445
	(0.019)	(0.099)	(0.140)	(1458.273)
Info	0.005	0.045	0.084	463.867
	(0.016)	(0.087)	(0.093)	(989.997)
R^2	0.009	0.035	0.026	0.026
Observations	2464	311	470	451
Clusters	220	165	200	199
Control mean	.013	.07	.207	3120.69

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the impact of chiefs collecting taxes on their diversion of cash transfers by the cross-randomised sub-treatments described in Section 7.3. Specifically, the table compares corruption outcomes in neighbourhoods where the chief taxed with those where the chief did not tax by exposure to the cross-randomised information and collective action treatments (the excluded category is neighbourhoods where chiefs did not tax and that received no cross-randomised treatment). Column 1 is a dummy variable that takes a value of 1 if a citizen of the neighbourhood reported that the chief asked for something in exchange for allocating the citizen a ticket (and 0 otherwise). Column 2 is a dummy variable that takes a value of 1 if a lottery winner discovered that the cash transfer was not in the envelope given by the chief, suggesting that the chief had stolen the cash (and 0 otherwise). Column 3 is a dummy variable that takes a value of 1 if a citizen reported that they did not win a cash transfer in the lottery even though enumerators' archives suggested that they had won, suggesting the chief had stolen or diverted the cash transfer (and 0 otherwise). Column 4 is the amount of the cash transfer in FC missing from the prize amount allocated to a winning citizen, calculated by subtracting the amount reported as having been received in surveying from the amount the household was supposed to receive. All regressions include tax stratum fixed effects using strata for the assignment of cross-randomised arms (assigned at the chief-level) and cluster standard errors at the neighbourhood level. We discuss these results in Section 7.

Table A4.5 Chief accountability pressure and corruption outcomes

	Asked something for ticket		Cash not in envelope		Transfer not received		Amount of cash stolen (CSh)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Knows fired chiefs	-0.033**		-0.087**		-0.076		-614.905	
	(0.015)		(0.035)		(0.061)		(656.977)	
Expects to be monitored by citizens		0.010		-0.073		-0.218		-2776.881**
		(0.022)		(0.072)		(0.115)		(1206.941)
R^2	0.080	0.070	0.315	0.212	0.183	0.227	0.193	0.228
Observations	2421	1739	305	209	458	328	439	315
Clusters	216	159	160	114	195	141	194	140
Mean	.022	.022	.023	.023	.16	.16	2038.378	2038.378

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines whether chiefs who perceived greater accountability pressure were less likely to divert programme resources. Columns 1–2 consider a dummy variable outcome that takes a value of 1 if a citizen of the neighbourhood reported that the chief asked for something in exchange for allocating the citizen a ticket (and 0 otherwise). Columns 3–4 consider a dummy variable outcome that takes a value of 1 if a lottery winner discovered that the cash transfer was not in the envelope given by the chief, suggesting that the chief had stolen the cash (and 0 otherwise). Columns 5–6 consider a dummy variable outcome that takes a value of 1 if a citizen reported that they did not win a cash transfer in the lottery even though enumerators' archives suggested that they had won, suggesting the chief had stolen or diverted the cash transfer (and 0 otherwise). Columns 7-8 consider an outcome that is the amount of the cash transfer in FC missing from the prize amount allocated to a winning citizen, calculated by subtracting the amount reported as having been received in surveying from the amount the household was supposed to receive. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 7.

Table A4.6 Effects of chief tax collection on targeting of taxpayers

	Ticket recipient			Number of tickets		
	All (1)	Bottom 20% (2)	Top 80% (3)	All (4)	Bottom 20% (5)	Top 80% (6)
Taxpayer	0.011	0.068	-0.001	0.008	0.040	-0.013
	(0.012)	(0.096)	(0.029)	(0.016)	(0.148)	(0.043)
Chief taxed	-0.007	0.072**	-0.049***	-0.006**	0.106*	-0.054*
	(0.006)	(0.035)	(0.017)	(0.003)	(0.063)	(0.032)
Chief taxed * taxpayer	0.039*	-0.028	0.092**	0.056**	-0.057	0.162**
	(0.021)	(0.121)	(0.044)	(0.027)	(0.184)	(0.074)
Control mean	.149	.637	.72	.191	.82	.921
Number of taxpayers		102	719		102	719
Fraction of taxpayers		.102	.137		.102	.137
Clusters	221	216	221	221	216	221
Observations	29630	1000	5267	29630	1000	5267

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table summarises the results for chiefs' allocation of programme tickets by household property tax payment status. Row 1 is a dummy variable indicating whether the household paid the property tax in 2018. Row 2 is an indicator for whether the chief collected taxes in the neighbourhood during the 2018 property tax campaign. Row 3 is the interaction between the Taxpayer indicator (Row 1) and the Chief Taxed indicator (Row 2). Columns 1–3 use an indicator for whether the household is a ticket recipient as the outcome and Columns 4–6 use the number of tickets received as the outcome. Columns 1 and 4 consider the entire sample of households, while Columns 2–3 and 5–6 restrict the sample to households for which the wealth index measure is available. Wealth is measured by an index of pooled house and neighbourhood quality, which is a standardised index including wall quality, erosion threat, road quality and accessibility. Using this index, households are split into two groups: households in the bottom 20 per cent of the wealth distribution (Columns 2 and 5) and households in the top 80 per cent of the wealth distribution (Columns 3 and 6). All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 8.

Table A4.7 Targeting of vulnerable households: widows, elderly, disabled people

	Ticket recipient			Number of tickets		
	All (1)	Bottom 20% (2)	Top 80% (3)	All (4)	Bottom 20% (5)	Top 80% (6)
Vulnerable	0.140***	0.140**	0.165***	0.262**	0.182***	0.198***
	(0.013)	(0.058)	(0.022)	(0.121)	(0.018)	(0.039)
Chief taxed	0.002	-0.016	-0.008	-0.014	-0.007	-0.060
	(0.010)	(0.066)	(0.029)	(0.103)	(0.012)	(0.049)
Chief taxed * vulnerable	0.009	0.052	-0.021	0.037	0.043	0.088
	(0.020)	(0.088)	(0.034)	(0.161)	(0.032)	(0.075)
Control mean	.14	.655	.678	.851	.182	.883
Number of taxpayers	6887	350	1944	350	6887	1944
Fraction of taxpayers	.47	.653	.649	.653	.47	.649
Clusters	221	188	220	188	221	220
Observations	14667	536	2995	536	14667	2995

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This examples whether vulnerable households — those headed by widows, elderly people and disabled people — are more likely to receive tickets for the cash transfer programme. Vulnerable households are identified systematically in the property register data because they are exempt from the property tax. Row 2 is an indicator for whether the chief collected taxes in the neighbourhood during the 2018 property tax campaign. Row 3 is the interaction between the Vulnerable indicator (Row 1) and the Chief Taxed indicator (Row 2). Columns 1–3 use an indicator for whether the household is a ticket recipient as the outcome and Columns 4–6 use the number of tickets received as the outcome. Columns 1 and 4 consider the entire sample of households while Columns 2–3 and 5–6 restrict the sample to households for which the wealth index measure is available. Wealth is measured by an index of pooled house and neighbourhood quality, which is a standardised index including wall quality, erosion threat, road quality and accessibility. Using this index, households are split into two groups: households in the bottom 20 per cent of the wealth distribution (Columns 2 and 5) and households in the top 80 per cent of the wealth distribution (Columns 3 and 6). All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 8.

Table A4.8 Targeting by vulnerability category

	Widow	Disabled	Senior
Chief taxed here (*Local*)	0.018	0.005	-0.021
	(0.037)	(0.009)	(0.038)
Control mean	.388	.014	.534
Clusters	215	215	215
Observations	1175	1175	1175

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines the differences in tax exemption categories granted during the 2018 tax campaign to programme ticket recipients by whether chiefs were in charge to tax collection in a neighbourhood. Differences are shown for the main exemption types granted to individuals: widows (Column 1), disabled people (Column 2) and seniors (Column 3). All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 8.

Table A4.9 Chief tax collection and obedience to the state

	Obey the state over people	Locate school by state preference
Chief taxed here (*Local*)	-0.017	-0.012
	(0.140)	(0.138)
R^2	0.358	0.299
Observations	219	221
Control mean	.022	.062

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines differences in obedience to the state by whether the chief collected tax. The outcome in Column 1 is the extent to which the chief agrees with the point of view that their 'primary responsibility is to serve the people on their avenue/neighbourhood, even if it means disobeying the state' rather than that 'their primary responsibility is to obey the state, even if it means disobeying the wishes of the people on the avenue/neighbourhood'. The variable is standardised. The outcome in Column 2 asks chiefs where they would locate a school on a line between point A – where the state wants it – and point E – where the citizens want it. The variable is standardised and increasing in choosing the state's preferred location. All regressions include tax stratum fixed effects and robust standard errors. We discuss these results in Section 8.

Table A4.10 Chiefs' self-reported development responsibilities

Index:	Economic relief	Public goods provision	Arbitrate dispute	All responsibilities
Chief taxed *here* (*Local*)	0.221	-0.015	0.071	0.127
	(0.139)	(0.130)	(0.140)	(0.141)
R^2	0.315	0.369	0.285	0.327
Observations	221	221	221	221
CompMean	.073	.035	.066	.08

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table compares chiefs' self-reported development leadership activities in the neighbourhoods where the chief taxed compared to those where the chief did not tax. Column 1 is an index of a chief's involvement in economic relief for the neighbourhood, including (1) ensuring that citizens have enough money to survive and (2) helping citizens find jobs. Column 2 is an index of chiefs' efforts to (1) provide citizens with water, health care and other public services and (2) organise *salongo* to help improve public infrastructures. Column 3 is an index of a chief's efforts in arbitrating disputes, including (1) resolving disputes among households, (2) solving crimes and (3) punishing criminals. Column 4 is an index of all aforementioned variables. All variables take a value of 3 if a chief says that this task is very much their responsibility, 2 if the chief thinks that it is more their responsibility than the responsibility of another government agent, 1 if the chief thinks that it is more the responsibility of another government agent than their responsibility and 0 if the chief thinks that it is much more the responsibility of another government agent than their responsibility. All regressions include tax stratum fixed effects and cluster standard errors at the polygon level. We discuss these results in Section 7.2 and 8.

Table A4.11 Chief management skills

	Chief arrived at lottery late	Chief arrived at lottery early	Entered ticket code correctly
Chief taxed here (*Local*)	0.011	0.006	-0.010
	(0.032)	(0.072)	(0.021)
R^2	0.326	0.264	0.248
Observations	221	221	4144
Clusters			208
Control mean	0.064	0.527	0.975

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.
Notes: This table examines differences in chief management skills by whether the chief collected tax. Management is measured by whether they were late (Column 1) or early (Column 2) for the lottery draw and whether they entered programme ticket code information correctly (Column 3). All regressions include tax stratum fixed effects and robust standard errors (Columns 1 and 2) or cluster standard errors at the neighbourhood level (Column 3). We discuss these results in Section 8.

Table A4.12 Effects of employment information on chief targeting

		By wealth status		By wealth level				
	Any error	Exclusion error	Inclusion error	Exclusion error		Inclusion error		Average income
				(very poor)	(near poor)	(middle)	(rich)	
	Full	0%-20%	21%-100%	0%-10%	11%-20%	21%-60%	61%-100%	Recipients
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Chief taxed here (*Local*)	-0.082***	-0.073***	-0.026***	-0.100**	-0.070**	-0.027**	-0.031**	-0.158*
	(0.019)	(0.023)	(0.008)	(0.046)	(0.033)	(0.013)	(0.015)	(0.081)
Chief taxed here x employment info	0.068	0.062	0.031	0.060	0.127**	0.066*	-0.000	0.144
	(0.043)	(0.047)	(0.023)	(0.081)	(0.061)	(0.036)	(0.032)	(0.126)
Employment info	0.005	-0.013	0.019	0.048	-0.118**	0.012	0.019	-0.099
	(0.029)	(0.031)	(0.017)	(0.056)	(0.046)	(0.027)	(0.023)	(0.093)
R^2	0.033	0.073	0.008	0.223	0.091	0.023	0.025	0.158
Observations	6267	1002	5265	446	556	2442	2823	4384
Clusters	221	216	221	193	195	218	221	220
Control mean	0.316	0.903	0.159	0.893	0.913	0.154	0.163	0.066

Source: Authors' analysis of data from DGRKAC 2018, DIVAS 2019, and authors' own.

Notes: This table examines the robustness to heterogeneity in the impact of chiefs collecting taxes on their allocation of cash transfer programme tickets by whether a property owner's employment was included in the information given to chiefs during programme ticket allocation. The treatment variable is a dummy for information about the property owner's job being provided. In this table, errors are determined using the pre-specified wealth index and estimated on sample-weighted data, as described in Section 4.2. Columns 1-7 examine errors of inclusion (non-poor households receiving programme tickets) and exclusion (poor households failing to receive programme tickets). Specifically, in Column 1, the outcome is any error (inclusion or exclusion), estimated in the full population of households for which the wealth index measure is available. In Columns 2 and 3, the outcome is errors of exclusion among households in the bottom quintile of the wealth distribution and inclusion among households above the bottom quintile respectively. Columns 4 and 5 consider errors of exclusion for the very poor and near poor. Columns 6 and 7 consider errors of inclusion for the middle and rich categories. Column 8 shows the average wealth level among programme ticket recipients. All regressions include tax stratum fixed effects and cluster standard errors at the neighbourhood level. We discuss these results in Section 9.

Appendix 5 Decision theoretical framework

This section outlines a simple decision theoretical framework to clarify the logic of the three mechanisms examined in the paper.

Assume that a neighbourhood has n poor households plus non-poor and elite households; the chief belongs to the elite. The chief receives n transfers to allocate. Assume further that the median citizen prefers transfers to be allocated to poor households. Finally, assume that non-elites have perfect information about who is poor, while the chief faces uncertainty. The chief's problem is whether to distribute a transfer to a poor household or to divert it to someone in his elite network.

If the chief makes transfer t to poor household i, he gets utility:

$$EU^{transfer} = m - p_i r \tag{3}$$

If the chief diverts the transfer, he gets utility:

$$EU^{divert} = g(t) - r \tag{4}$$

subject to the reputation constraint:

$$\sum_{j=1}^{i} r_j < \bar{r} \tag{5}$$

where:

- m is the morale (psychic) payoff of doing one's job well,
- p_i is the probability that household i is not poor (the risk of misallocation),
- r is the reputation cost of misallocating a transfer (to non-poor),
- $g'() > 0$, for example $g() = t(1 - x)$ with $x \in [0, 1]$, the 'distance' to chief,
- $r_j = p_j r$ or r if chief transfers or diverts, respectively,
- $\bar{r}$ is the reputation constraint above which chief loses power.

- The chief chooses to divert transfer i if:

$$g(t) > m + r(1 - p_i) \quad and \quad \sum_{j=1}^{i} r_j < \bar{r} \tag{6}$$

This means that diversion **increases** in:

- The magnitude of the transfer t,
- The probability of misallocation p_i, and
- The reputation constraint $\bar{r}$.

By contrast, diversion **decreases** in:

The chief's morale m, and

The reputation cost of misallocation r.

Now consider the possible effects of tax collection. Firstly, it could lead to potential accountability costs:

1. **Misalignment**: ↓ m — decreases morale payoff → more diversion. If the chief is more misaligned with the neighbourhood, he will feel less of a warm glow from allocating to poor households and thus choose to divert more resources.
2. **Power**: ↑ $\bar{r}$ — loosens reputation constraint → more diversion. If tax collection makes the chief more powerful, he essentially has more slack within which he can divert resources before the reputation constraint binds.

But tax collection could also lead to potential accountability benefits:

1. **Learning**: ↓ p — decreases the probability of misallocation → less diversion. If the chief can be more confident that the transfers he intends to reach poor households truly reach the poor, then, all else being equal, he will allocate more resources to poor households.
2. **Preferences**: ↑ m — increase morale payoff → less diversion. If the chief receives greater warm glow utility from allocating to the poor, then he will divert less.
3. **Citizen pressure**: ↓ $\bar{r}$ — tightens reputation constraint → less diversion. If citizen monitoring and pressure increases, the chief can get away with less

diversion before risking losing power.

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