

# Tax morale, public goods, and politics: Experimental evidence from Mozambique

Wayne Aaron Sandholtz\*

Pedro C. Vicente<sup>†</sup>

September 5, 2024<sup>‡</sup>

## Abstract

Tax revenue is vital for development, but governments must balance raising revenues with maintaining political support. Partnering with a city government in Mozambique, we experimentally test a grounded hypothesis: that tax morale and political support are increased by information highlighting 1) public good provision and 2) local political autonomy. We find that the treatments have different strengths. Public goods information raises tax morale, driven by areas of low baseline public good provision, but has no effect on voting. The political message increases electoral support but raises tax morale only among co-partisans. Balancing tax morale and political support requires careful communication.

**Keywords:** Tax morale, public goods, information, political economy, experiments, Mozambique

**JEL Codes:** O12, H00, P00, C93

---

\*Nova School of Business and Economics, CESifo, IZA, and NOVAFRICA.

<sup>†</sup>Nova School of Business and Economics, BREAD, CEPR, and NOVAFRICA.

<sup>‡</sup>Corresponding author: Wayne Aaron Sandholtz. E-mail: [wayne.sandholtz@novasbe.pt](mailto:wayne.sandholtz@novasbe.pt). Carolina Grande provided stellar research assistance. IRB approval was received from NovaSBE (protocol #202241). A randomized controlled trial registry entry, ID # AEARCTR-0010628, is available at: <https://www.socialscisearch.org/trials/10628>. The evaluation was supported by IGC.

# 1 Introduction

Raising tax revenue is vital for development, but it can be politically challenging (Besley & Persson, 2013; Peltzman, 1992). Measures which increase both political support and voluntary tax compliance — tax morale — are therefore highly valuable. One possibility is to inform citizens about the quality of public goods, which could raise tax morale namely for those who update positively (Besley, 2020). An alternative is to highlight the necessity of tax revenues for achieving political objectives, which may increase tax morale for those who share those objectives (Cullen, Turner, & Washington, 2021).

Tax morale, as typically understood, depends on the reciprocity inherent in the social contract by which the government uses citizens' contributions to provide public goods (Luttmer & Singhal, 2014). This has two potential policy implications. First, providing public goods (or even simply informing citizens about them) could increase willingness to pay taxes. Second, the degree of citizens' control over tax revenues could also matter. Local political autonomy may appease citizens concerned about whether the right public goods are provided. This could be particularly relevant when political frictions exist between local and central governments.

In this paper, we experimentally study how information about public good provision and/or local political autonomy affects tax morale and political support among property owners in the city of Quelimane, Mozambique. Quelimane provides an ideal setting partly because it is emblematic of the challenges of local tax collection faced by jurisdictions around the world. Its population is about 500,000, with rapid population growth putting pressure on the networks of roads, sanitation, and drainage which constitute its public goods jurisdiction. Authority to collect property taxes has been decentralized in the country, and the municipality's capacity for enforcement is still weak. Quelimane's position is broadly typical across the continent: over 60% of Africa's urban population lives in agglomerations of less than a million inhabitants, but the urban population is projected to double by 2050, increasing pressure on governments like Quelimane's to improve infrastructure and services (United Nations, 2018; Saghir & Santoro, 2018). The politics of fiscal decentralization in Quelimane also resonate in many jurisdictions worldwide. Like many semi-autocratic states, Mozambique's most competitive elections are at the municipal level – Quelimane is one of the few opposition-governed cities. Still its fiscal and political autonomy are limited by budgetary dependence on transfers from the central government (Brollo & Nannicini, 2012).

We conducted our experiment among a representative sample of over 900 property owners in the city. We first collected baseline data on respondents' characteristics, including tax attitudes and past political

behavior. All respondents were provided with information about property tax rates and the municipal budget prior to the cross-randomized presentation of two information treatments. The “public goods” message presented the idea of the social contract as the reciprocal relationship by which citizens pay taxes in exchange for public services from the state. This message also provided a summary and photos of recent infrastructure built by the municipal government, including roads repaired, drainage ditches dug, and sanitation improvements. The “local autonomy” treatment highlighted the municipality’s budget dependence on the central government and the constraints this placed on its political and fiscal autonomy. The message was unmistakably partisan: it drew on language used in political speeches by the incumbent mayor, and included photos of him in speeches and campaign rallies. We also study the interaction of the two treatments because, although in practice governments emit many communications, few studies examine how different messages might enhance or interfere with each other.

Our main result is that information about public good provision raised tax morale, as measured by both survey responses and real payments in a public goods game (Table 2). In the control condition, 62% of respondents said it was “likely” or “very likely” they would pay the property tax if assessors came to evaluate their property. The public goods message raised this by 8.5 percentage points (14%). In the public goods game, 32% of control group participants chose to contribute a positive amount to the public good by making a mobile money transfer. The public goods treatment raised this by 9.4 percentage points, a 29% increase. This effect was entirely concentrated among respondents with low baseline experience of public good provision, suggesting that respondents may update based on the information presented.

The local autonomy treatment had no average effect on tax morale on its own, and it attenuated the positive effect of the public goods treatment when they were combined. In fact, measures of tax morale for respondents who heard both messages were not statistically different from the control group. The exception was for strong partisans of the opposition party which governs the city, whose contributions were increased by the local autonomy message, alone and when added to the public goods one. Taken together, these results suggest that taxpayers respond positively to information about public good provision, but become disillusioned when the message of government effectiveness is mixed with an explicit political message with which they do not agree.

Turning to political outcomes, we find that while the public goods treatment increased satisfaction with government, only the local autonomy treatment changed voting choices. Specifically, the public goods treatment increased satisfaction with both the municipal and national governments. The public goods message had no significant effect on people’s vote choice in a mock ballot exercise, but the local

autonomy message increased vote share for opposition parties at various levels of government.

Our first contribution is to the literature on how information about public service provision influences various aspects of citizens' relationship with the state. Altering these relationships with information can be difficult: for example, [Khan, Nasim, Shaukat, and Stegmann \(2021\)](#) find no effect of information on past state effectiveness in Pakistan on citizens' support for policy, perceptions of state capacity, or trust in the state. In the realm of taxes however, similar treatments to ours in Tanzania and the UK have been shown to raise tax compliance by nudging taxpayers to think about the social contract ([Collin, Di Maro, Evans, & Manang, 2021](#); [Hallsworth, List, Metcalfe, & Vlaev, 2017](#)).<sup>1</sup> Existing evidence from Italy, Chile, and Brazil also shows that information about public goods or government service quality can affect elections ([Kendall, Nannicini, & Trebbi, 2015](#); [Cox, Eyzaguirre, Gallego, & García, 2024](#); [Dias & Ferraz, 2020](#)). Our findings add that pointing out concrete public good achievements can also be effective at raising tax morale and satisfaction with government. Beliefs matter: [Castro and Scartascini \(2015\)](#) found that the effect of informing taxpayers about the government's performance depended on people's priors. Our results confirm this lesson, showing that the effect of the public good message depended on people's prior experience of public goods.

Our findings are also relevant to research on how public goods themselves affect both tax morale and voting. Despite the natural tension between asking citizens for more taxes and their electoral support, we are not aware of any study to date which examines effects on both outcomes in the same context ([Prichard, 2018](#)). Existing work using natural experiments has found positive effects on tax compliance of sidewalks in Argentina ([Carrillo, Castro, & Scartascini, 2017](#)), electrification in Africa ([Blimpo, Mensah, Opalo, & Shi, 2018](#)), sewerage in Brazil ([Kresch, Walker, Best, Gerard, & Naritomi, 2023](#)), and paved roads in Mexico ([Gonzalez-Navarro & Quintana-Domeque, 2015](#)).<sup>2</sup> On the political side, governments have been shown to win votes through infrastructure in India and the US ([Butler & Boudot Reddy, 2023](#); [Huet-Vaughn, 2023](#); [Leff-Yaffe, Nakab, & Sandholtz, 2023](#)), and through education policy in the US ([Biasi & Sandholtz, 2024](#)).<sup>3</sup> Our study builds on this literature by showing that public goods information alone can be sufficient to affect both tax morale and political attitudes.

We also add to the literature on tax morale's relationship to decentralization and fiscal federalism. The

---

<sup>1</sup>[Acemoglu, Cheema, Khwaja, and Robinson \(2020\)](#) identify a similar phenomenon regarding public service usage: information about improvements to courts in Pakistan raised people's willingness to use them.

<sup>2</sup>[Brockmeyer, Garfias, and Suárez Serrato \(2024\)](#) find no effect of a randomized Mexican infrastructure program, however.

<sup>3</sup>[Krause \(2020\)](#) shows that in a Haitian municipality, garbage collection increased tax compliance and reduced political unrest, though not in an electoral context. Null or negative electoral effects, meanwhile, have been found for infrastructure in India and Mexico ([Goyal, 2023](#); [Garfias, Lopez-Videla, & Sandholtz, 2021](#)), public housing in Brazil ([Bueno, Zucco, & Nunes, 2023](#)), and charter schools in Liberia ([Sandholtz, 2023](#)).

ability of sub-national governments to finance themselves appears to be important for economic growth. [Arzaghi and Henderson \(2005\)](#) find a positive cross-country correlation between growth and fiscal decentralization, while [Enikolopov and Zhuravskaya \(2007\)](#) find that local political subordination relative to central government deteriorates the outcomes of fiscal decentralization. Recent empirical work also shows that public services improve when funded by local taxes ([Gadenne, 2017](#); [Bianchi, Giorcelli, & Martino, 2023](#)). Turning to tax morale specifically, [Torgler \(2005\)](#) and [Torgler, Schneider, and Schaltegger \(2010\)](#) find positive correlations between tax morale and direct democracy or local autonomy. In a lab experiment, [Güth, Levati, and Sausgruber \(2005\)](#) identify a positive effect of decentralization on tax morale. Policy-makers have also been shown to believe that appeals to fiscal independence raise tax morale ([Luttmer & Singhal, 2014](#)). Related research underscores that people are happier to pay taxes when they agree with what the revenue is used for ([Cullen et al., 2021](#); [Alm, Jackson, & McKee, 1993](#)). To this work our paper adds the insight that highlighting partisan tensions in a decentralized context can raise tax morale for supporters of the local government’s party.

Finally, we contribute to the broader body of research on raising revenues in contexts of low state capacity (summarized in a recent review by [Okunogbe and Tourek \(2024\)](#)). While ramping up enforcement has been shown to increase compliance in higher-income countries ([Slemrod, Blumenthal, & Christian, 2001](#); [Bott, Cappelen, Sørensen, & Tungodden, 2019](#); [Bergolo, Ceni, Cruces, Giacobasso, & Perez-Truglia, 2023](#)), low-income countries often have to seek other solutions. Effective strategies have included incorporating new technology ([Okunogbe & Santoro, 2023](#)), enlisting local chiefs and increasing public oversight in the DRC ([Balán, Bergeron, Tourek, & Weigel, 2022](#); [Henn, Paler, Prichard, Samii, & Sánchez de la Sierra, 2024](#)), and leveraging trading networks in Uganda ([Almunia, Henning, Knebelmann, Nakyambadde, & Tian, 2023](#)). Our results suggest that low-cost information interventions offer a potentially attractive tool for resource-constrained governments seeking to raise revenue.

## 2 Context

The city of Quelimane in Mozambique is typical of many urban contexts in Africa in various ways. Its population makes it comparable to the sub-million-resident cities home to the majority of urban dwellers in Africa and the world ([United Nations, 2018](#)). Like many cities in developing countries, Quelimane is growing rapidly: it has more than tripled in population since 2000, placing stress on public services ([United Nations, Department of Economic and Social Affairs, Population Division, 2018](#)). The municipal

government’s jurisdiction extends over local road construction, sanitation, and drainage systems (which are crucial given Quelimane’s coastal location on the Indian Ocean and proneness to tropical cyclones – see [Leeffers \(2023\)](#)).

Mozambique is classified as an “electoral autocracy,” like many other countries in the world (representing 43% of the world’s population): citizens vote in multi-party elections, but they lack many safeguards to ensure they are free and fair.<sup>4</sup> In practice, this means that the ruling party FRELIMO dominates elections at the national level, but that local elections have been successfully contested by opposition parties in a handful of jurisdictions. That is the case of the current opposition mayor in Quelimane who represents RENAMO (the largest opposition party) - he won the municipal election in Quelimane in 2011 and has governed there ever since (as of 2024).<sup>5</sup>

The vast majority of the city’s budget – around 70% – comes from transfers from the central government, creating a dependency with important political ramifications given that the city is governed by an opposition party. Tax revenues make up less than 5% of the city’s budget, with property taxes constituting the majority of these. Property owners in Mozambique are subject to a Municipal Property Tax (*Imposto Predial Autárquico* or *IPRA*), equivalent to 0.4% of the assessed value of the property for residential properties and 0.7% for commercial properties. Enforcement is uneven: only 457 individuals paid property tax in Quelimane in 2019, contributing a total of 4.3 million meticaís (USD 66,447, or about USD 145 per payer). By 2021, this had risen to 658 taxpayers contributing the equivalent of USD 105,945. Figure A.1 in the Appendix shows the sources of Quelimane’s revenues for 2015-2020.

## 3 Data and Design

### 3.1 Survey

To build a body of evidence on municipal tax morale in Quelimane, we surveyed a representative sample of property owners in November/December 2022. The city is divided into 5 Administrative Posts (*Postos Administrativos*), which are further subdivided into 51 neighborhoods (*bairros*), which in turn are further subdivided into 558 blocks (*quarteirões*). We first selected a random sample of blocks from which to

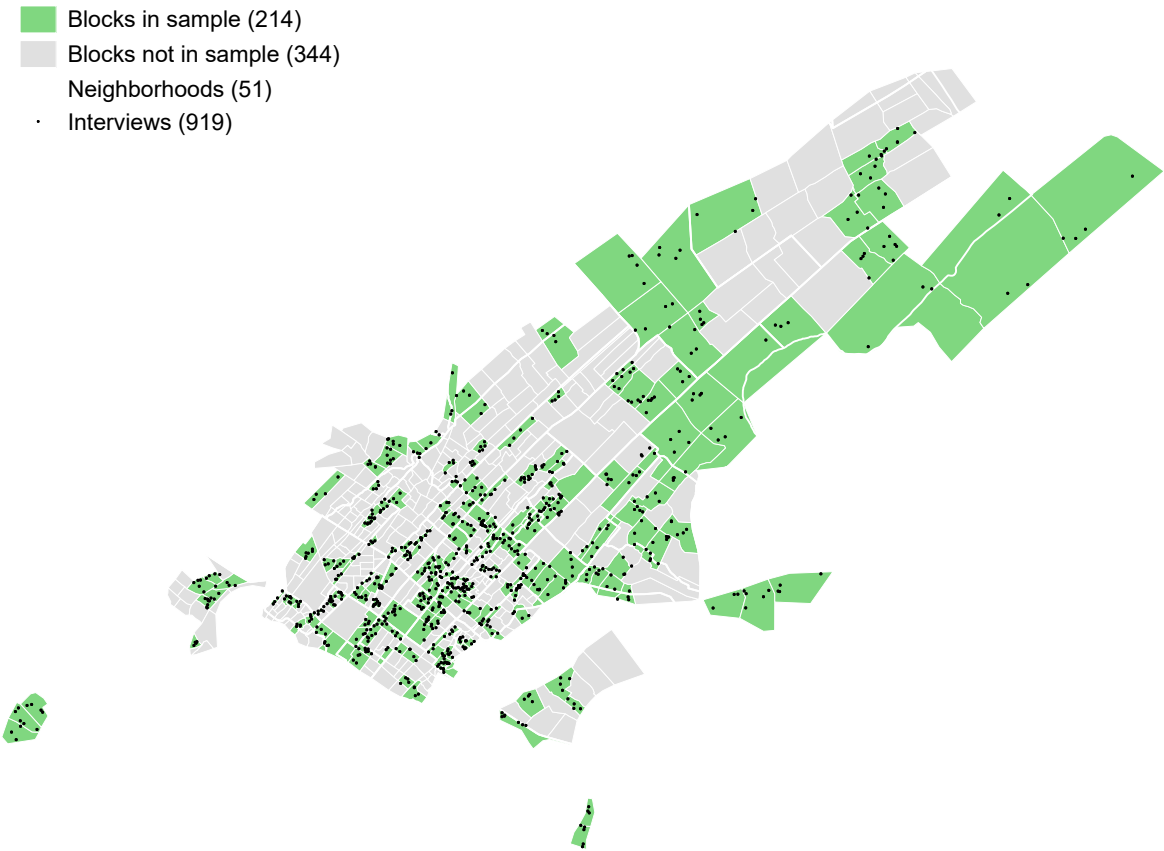
---

<sup>4</sup>According to the V-Dem (Varieties of Democracy) Institute’s “Regimes of the World (RoW)” classification, which includes 4 categories: closed autocracy, electoral autocracy, electoral democracy, liberal democracy ([Coppedge et al., 2024](#)). Similarly, Mozambique is rated as “partly free” by Freedom House, and an “Open Anocracy” in the categorization of Polity IV ([Freedom House, 2023](#); [Marshall, Gurr, & Jaggers, 2023](#)).

<sup>5</sup>The current mayor was first elected in 2011 as a candidate of the MDM, another (smaller) opposition party, but joined RENAMO ahead of the 2018 municipal election cycle.

sample respondents. We then placed at least four randomly chosen points within each block’s boundaries to indicate which properties were to be surveyed. When a point was not on an identifiable property, or on a property where no owner was available to interview, enumerators followed a pre-codified random walk procedure until arriving at a property where an eligible respondent was available to interview. The final analysis sample, representative of the properties in the city, consists of 922 properties in 214 blocks. Figure 1 displays a map of the distribution of sampled blocks and properties across the city.

Figure 1: Surveyed properties



Black dots show the locations of surveyed properties. Green blocks are those randomly selected to have properties sampled; unsampled blocks are gray. Neighborhoods are demarcated by thick white lines. Three respondents who consented to participate but not to have their location recorded are excluded from the map.

The sampled respondents were surveyed over the course of about two weeks. The survey took about one hour. In addition to basic demographic characteristics, it measured respondents' beliefs and attitudes about the tax system – for example, whether and when they been asked to pay property taxes, whether they thought rates were fair, how well they thought the system worked, and how many of their neighbors and fellow residents they thought were paying taxes. We also included a battery of questions about respondents' trust in the government (mostly drawing on standard wording from the Afrobarometer), as well as a set of questions about their experience with and knowledge about public services relating to the social contract. Table 1 presents summary statistics.

These descriptive statistics help illuminate some characteristics of the population. Well over half (59%) of property owners are women. About 18% are Muslim, compared to 19% for Mozambique as a whole (U.S. Department of State, 2023). About half of respondents were born in Quelimane. Eighty-four percent are literate, and 44% finished secondary school.<sup>6</sup> Employment situations vary widely, with meaningful minorities in professional occupations, in agriculture, and not working at all. Respondents' reported weekly income averages 31 USD (compared to a weekly GDP per capita of 12 USD, according to [The World Bank \(2024\)](#)).

The majority of dwellings were built by their current owner (69%), and nearly all are owner-occupied, with the average dwelling housing around 5 inhabitants. Only about half have any form of title documentation. Most have metal roofs, but a significant minority (37%) has earthen floors.

Some striking facts about tax collection in the municipality also emerge:

- Tax information is minimal. Only 26% of respondents have heard of the municipal property tax. The average resident believes the annual tax rate to be 37 times higher than the actual one (15% of the value of the property, compared to the true rate of 0.4% for residential properties).
- Tax compliance is low. Only 17% of property owners report having paid property tax in the past year. State capacity is a likely bottleneck: only 8% report that their property has ever been evaluated. The average resident believes that about 24% of property owners in the city paid property tax in the last year.
- Tax morale appears relatively high. One measure of this is that the number of people who report paying property tax is more than double that which reports having been assessed. Another is

---

<sup>6</sup>This secondary school completion rate is comparable to the ones of girls (41%) and boys (44%) but for lower secondary schooling (UNESCO Institute for Statistics (UIS), 2024).



Table 1: Summary Statistics

	Mean	SD	N
<b>Demographics:</b>			
Female	0.59	0.49	922
Muslim	0.18	0.39	921
Born in Quelimane	0.46	0.50	922
Literate	0.84	0.37	922
Finished secondary school	0.44	0.50	922
Employment: professional	0.15	0.36	919
Employment: agriculture	0.15	0.36	919
Unemployed	0.19	0.40	919
Weekly income (USD)	30.71	81.82	793
<b>Property:</b>			
Owner lives at property	0.98	0.15	921
Has any property document	0.55	0.50	922
Built by current owner	0.69	0.46	922
Inhabitants of house	5.40	2.26	911
Earthen floor	0.37	0.48	922
Metal roof	0.90	0.30	922
<b>Taxes:</b>			
Muni. has authority to tax property	0.90	0.30	922
Gov. uses tax revenue well	0.57	0.49	922
Prefers higher taxes and better services	0.68	0.47	922
Has heard of muni. property tax	0.26	0.44	922
Property ever assessed	0.08	0.27	922
Paid property tax in last year	0.17	0.37	922
Belief: share of neighbors paying prop. tax last yr	0.32	0.35	694
Belief: share of city property owners paying prop. tax last yr	0.24	0.26	692
Belief: Property tax rate	15.33	24.12	876
<b>Services:</b>			
Belief: Muni. budget (USD/capita/yr)	174.90	1319.28	614
Belief: share of muni. budget from federal transfers	0.33	0.29	626
Gov 'never' collects garbage	0.62	0.49	922
Gov 'never' repairs street	0.55	0.50	922
Gov 'never' repairs drainage ditches	0.55	0.50	922
<b>Politics:</b>			
'Never' discusses politics	0.58	0.49	922
Belief: share of city property owners who voted FRELIMO in 2018	0.32	0.28	763
Voted in 2018 municipal election	0.82	0.39	922
Voted FRELIMO in 2018	0.50	0.50	680
Voted in 2019 national election	0.76	0.43	922
Voted FRELIMO in 2019	0.63	0.48	650

that beliefs about others' compliance are nearly double the actual reported compliance; willingness to pay taxes has been shown to correlate negatively with the number of people free-riding (Güth et al., 2005). Attitudes toward taxation are broadly favorable. Knowledge that the municipality has the authority to collect property taxes is nearly universal, 57% think the government uses tax revenues well, and 68% prefer a higher-tax, higher-service equilibrium. This may be related to widespread acknowledgment of poor public service provision: for each of the three main services in the municipality's ambit (garbage collection, street repair, drainage repair), large majorities report that the last time the government provided that service on their street was "never."

A majority (58%) say they never discuss politics, which may be indicative of the sensitive nature of discussing politics in Mozambique. That said, stated support for the national-level ruling party (FRELIMO) among property owners is perhaps surprisingly strong given that the opposition RENAMO party controls the city government. Half of respondents report having voted FRELIMO in the most recent municipal election; nearly two-thirds of respondents report the same when considering the most recent national election. However, the average belief about FRELIMO vote share among other property owners in the city is only 32%.

### **3.2 Experimental design**

Survey respondents were randomized at the sampling stage into one of four treatment arms corresponding to messages that would be presented within the context of the survey. This randomization procedure was implemented stratifying at the block level, as within each block, each of four sampled properties was allocated a different treatment condition. A quarter of the surveyed respondents/properties received information about Quelimane's recent achievements in public good provision; a quarter received information about how municipal tax collection increases the municipality's fiscal and political autonomy; a quarter received both pieces of information referred; and a quarter received neither. The treatments provided new information to respondents: large majorities of those who heard both treatment messages reported that they learned something new from them (62% for the public goods message, and 64% for the local autonomy message). The full text of the messages, in their original Portuguese as well as English translations, can be found in Section B. The pre-registration for the experiment, ID # AEARCTR-0010628, can be found at <https://www.socialscisceregistry.org/trials/10628>.

### **3.2.1 Control condition**

All experimental participants received a message providing information about property taxes; for control participants, this is the only message they received. The message described the property tax rate for residential and commercial properties. It also clarified that paying the property tax is necessary if the owner wishes to sell the property, and mentioned that property taxes contribute to the municipality's budget, which is about 500 meticaïs (USD 7.80) per citizen per year. (The average resident at baseline believed the municipal budget to be over 20 times higher, at about USD 175 per capita per year.)

### **3.2.2 Public goods condition**

The public goods treatment condition contained a message relating taxes with the social contract, as the agreement that citizens pay taxes in exchange for public services from the government. The message mentioned a number of major public works undertaken by the government in the last 10 years (since the current mayor was elected), including paved and resurfaced roads; construction and maintenance of drainage ditches; expansions of garbage collection services; construction of libraries, a school, and a market; and the regularization of property rights.

This treatment also included the showing of photos, through the enumerator's data collection tablet, depicting some of the public goods provided by the municipality: workers installing a traffic light, fire-fighters standing in front of a new fire engine, a backhoe cleaning out old drainage ditches, and a stretch of new drainage ditches dug alongside a paved road. (See Figure B.1.)

We hypothesize that this information raises tax morale for respondents for whom the information prompts them to update their existing beliefs about public good provision. It can also raise political support for the incumbent politicians.

### **3.2.3 Local autonomy condition**

The local autonomy treatment condition provided a political message which highlighted the municipality's need for tax revenue to strengthen its autonomy from the central government. Because Quelimane is one of the few municipalities in Mozambique controlled by the opposition party, the central government can act politically and minimize cooperation with the municipality, which is likely to create problems for local public service delivery. The message stated that 70% of the municipal budget comes from the central government (For comparison, the average respondent at baseline believed this figure to be 33%.), and that this fiscal dependency can create political dependency, a potential problem for enacting the public policies

that best serve the local population. Similar language has been used by the incumbent mayor in political speeches in the city.

The partisan tones of this political message were underscored by the four images shown to respondents in this treatment condition, which depicted the incumbent mayor engaging in political speeches or his trademark bicycle rallies. (See Figure B.2.)

We hypothesize that this information will raise tax morale for respondents who share the political objectives of the opposition party which governs the municipality (RENAMO). It can also raise political support for the opposition.

### 3.3 Outcome data

We collected outcome variables at the end of the survey, after the randomized information was provided. In this section we describe our measures of tax morale and political support.<sup>7</sup>

#### 3.3.1 Tax morale measures

Our primary survey measure of tax morale was derived from the respondents' answer to the question "If assessors came to evaluate your property, how likely is it that you would pay your property tax?" The corresponding variable we construct is a binary depiction of likelihood of paying, which takes a value of one if respondents answered they were "Likely" or "Very likely" to pay.

We also invited respondents to play a public goods game (with real stakes). This standard game is designed to mimic the structure of tax payment and service provision, gauging respondents' willingness to contribute to a productive endeavor with payoffs to other participants beyond oneself. In our context, players were offered a mobile money payment of 100 meticaïs (about USD 1.60). They were then placed in a group with nine other random and unknown survey respondents. Each player chose how much of their 100 meticaïs to contribute to a central pot labeled the "public good." The central pot was then doubled by the research team and redistributed equally among the 10 players, regardless of how much each contributed. Our main behavioral game-based measure of tax morale is a binary variable which takes a value of one if respondents contributed a positive amount in the public goods game.

---

<sup>7</sup>Our experimental registration pre-specified another outcome variable: a dummy for whether respondents sent a text message to a provided number to request more information or a visit from a tax assessor (see <https://www.socialscienceregistry.org/trials/10628>, registry ID # AEARCTR-0010628). Full details of the script of this behavioral message are given in Appendix A.2. Less than one percent of the sample ended up sending a text message, with no detectable difference across treatment arms. We report these results in Table A.1.

### 3.3.2 Political attitudes and voting measures

Our survey asked respondents not only about which parties and candidates they had voted for in previous elections, but also which parties and candidates they planned to support in upcoming elections. Because questions about electoral choices can be sensitive and not all respondents wish to answer, we supplemented these with a behavioral measure, previously implemented in [Gràcio and Vicente \(2021\)](#). Enumerators carried a mock “ballot box:” a clear plastic box with a slot in the top, filled with folded mock ballot papers. Near the end of the survey, each respondent was handed a paper mock ballot, and asked to privately tick the box next to the candidate she preferred at the municipal, provincial, and national levels. Respondents were then asked to fold the paper, without the enumerator seeing it, and place it in the slot in the ballot box along with the other mock ballots. This procedure was intended to increase respondents’ willingness to answer truthfully. However, the mock ballot which enumerators handed to the respondents was subtly pre-marked in a way that allowed enumerators to later open the box and identify the respondent’s mock ballot. As it turned out, this behavioral measure was highly correlated with survey responses on voting preferences, but appears to have captured some extra information indicative of reluctance among respondents to vocalize opposition to the ruling party.<sup>8</sup>

## 3.4 Empirical specification

Equation 1 presents the empirical specification we used to measure the causal effect of the information treatments on outcome variables:

$$Y_{ib} = \alpha_b + \beta_1 \text{PublicGoods}_i + \beta_2 \text{LocalAutonomy}_i + \beta_3 \text{PublicGoods}_i \times \text{LocalAutonomy}_i + \varepsilon_{ib} \quad (1)$$

$\alpha_b$  represent fixed effects for the city blocks within which randomization took place,  $\text{PublicGoods}_i$  is an indicator for whether respondent  $i$  heard the Public Goods message, and  $\text{LocalAutonomy}_i$  is an indicator for whether respondent  $i$  heard the Local Autonomy message.

Balance checks in [Table A.2](#) show that pre-treatment characteristics do not generally differ between treatment and control groups. The number of significant differences we observe between the groups is consistent with what would be expected by random chance: of 105 tests, 5 (4.8%) are significant at the

---

<sup>8</sup>Among respondents who both answered the survey question and filled the ballot corresponding to the national elections, 9% of responses differed across the two measures. The ballot also garnered slightly more responses than the survey question (93% vs. 90%). Among those who answered both measures, support for the ruling party was slightly higher in the survey question than the ballot (49% to 47%). However, among those who declined to give an answer to the survey question, support for the ruling party using the ballot measurement was much lower: 34%.

10% level, and 2 (1.9%) are significant at the 5% level.

## 4 Results

### 4.1 Effects on tax morale

Our first result is that information on public good provision raised respondents' tax morale. Table 2 shows estimates of the causal effect of the public goods and the local autonomy messages, as well as of their interaction, on survey responses and public goods game contributions. The public goods message increased the likelihood respondents reported being "likely" or "very likely" to pay the property tax if assessors came to their property. From a control group mean of 61.8%, this message increased the proportion by 8.5 percentage points (pp), or 13.8%. It is important to verify that these positive effects on tax morale were not limited to survey responses. Treated respondents were also 9.4 pp more likely to contribute a positive amount in the public goods game – an increase of 29.0% off a base of 32.4%. The effect of this message on the total amount respondents contributed was large and positive (2.3 meticaïs from a base of 13.4 in the control group) but not statistically significant.

We also show that the more politics-oriented local autonomy message had no significant effect on either measure of tax morale. In fact, the impact of the public goods message alone is significantly different from the impact of the local autonomy message. Moreover, the local autonomy message seems to have counteracted the effect of the public goods message: the interaction effect of the two treatments is consistently negative and large, although not statistically significant, making the group which received both messages statistically indistinguishable from the control group on these tax morale outcome measures.

Table 2: Effects of treatment on tax payment intentions and public goods contributions

	Likely to pay property tax	Public goods game: contributed	Public goods game: amount (meticaïs)
Public goods	0.085** (0.041)	0.094** (0.039)	2.311 (2.114)
Local autonomy	0.029 (0.041)	0.025 (0.039)	0.289 (2.110)
Public goods × Local autonomy	-0.090 (0.058)	-0.059 (0.056)	-1.998 (2.985)
N	922	922	922
Mean (control group)	0.618	0.324	13.400
p-val: T1=T2	0.174	0.080	0.335
p-val: T1 + T2 + T1 × T2 = 0	0.571	0.129	0.776

Coefficients from the regression specified in Equation 1, with standard errors shown in parentheses. 'Likely to pay property tax' indicates that the respondent answered 'Very likely' or 'Likely' to the question 'If assessors came to evaluate your property, how likely is it that you would pay your property tax?' 'Public goods game: contributed' indicates that the respondent contributed a positive amount in the public goods game. 'Public goods game amount: meticaïs' denotes the amount of meticaïs the respondent contributed in the public goods game. All regressions include block fixed effects. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

#### 4.1.1 Heterogeneity by baseline public good provision and partisan affiliation

Because people's reaction to information likely depends on how it interacts with their existing beliefs, we next test whether the information treatments affects respondents heterogeneously along these dimensions.

The public goods treatment may be expected to represent a bigger information shock for citizens whose own experience of public goods provided by the municipality has been worse. Our survey asked respondents about the frequency of provision of the three main public services within the municipality's purview: garbage collection, drainage, and road construction/maintenance.<sup>9</sup> We build dummies for whether respondents answered "never" for each of these variables, then create an index based on the first factor of the correlation matrix of these dummies (pairwise correlations between these variables are quite high, ranging between .42 and .65). We then split the sample into "high" and "low" baseline public good provision at the median of this index. We regress the dummy for contributing in the public goods game on the full set of treatment condition dummies (public goods, local autonomy, or both) — separately for respondents with high and low baseline public goods.

Figure 2a shows that the positive effect of the public good message on tax morale is concentrated among respondents who report low public good provision from their personal experience at baseline.

<sup>9</sup>The wording of the question was "When was the last time someone from the government [collected trash on your street; worked on building or cleaning/repairing the drainage ditches on your street; worked on building or repairing the access roads to your home]?" Options were "One week ago or less," "One month ago," "One year ago," "Several years ago," "Never," "Don't know."

This is consistent with taxpayers updating their priors in response to new information about public good provision.

The local autonomy treatment may be expected to be particularly persuasive for citizens whose own political beliefs predispose them to share the goals of the opposition party which governs the municipality (RENAMO). We identify as “RENAMO partisans” the respondents who report having voted for RENAMO party candidates in both the 2018 municipal elections and the 2019 national elections. We regress the dummy for contributing in the public goods game on the full set of treatment condition indicators — separately for RENAMO partisans and all other respondents.

Figure 2b shows that, among RENAMO partisans, the effect of the public goods message is even larger than for the general population, and that the effect of the local autonomy message is positive and significant as well ( $p < 0.1$ ). Furthermore, the local autonomy message appears not to have diminished the effect of the public goods message as in the overall sample. This is consistent with the local autonomy message being effective for those whose political goals incline them toward greater empowerment of the municipal government.

These results suggest that both information treatments’ effects were concentrated among those whose prior beliefs predisposed them to be affected by the information.

## 4.2 Effects on politics

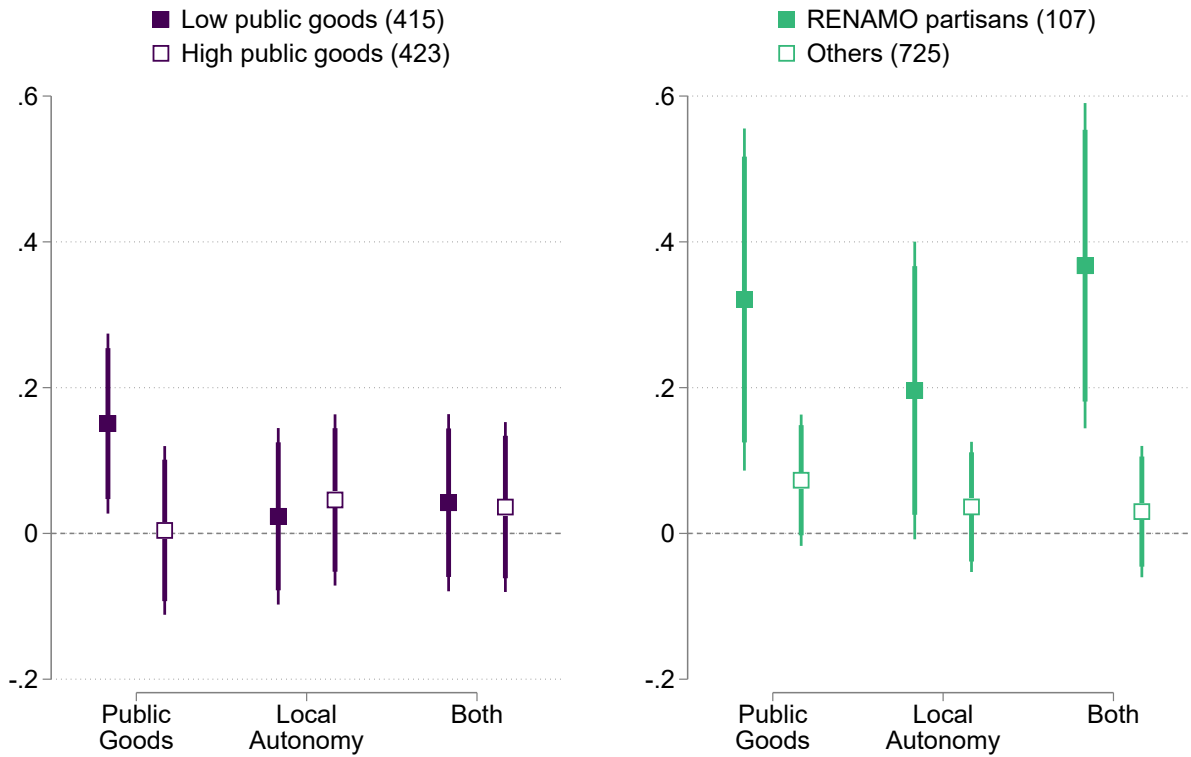
Table 3 shows the treatment effects on political outcomes. The public goods message raised respondents’ level of satisfaction with both the municipal government of Quelimane and the national government of Mozambique, by 7.7 and 9.9 pp respectively. The local autonomy message again had no impact on its own, and again negated the effect of the public goods message. The public goods message also increased the expectation of FRELIMO vote share in the following municipal elections.<sup>10</sup> The magnitude of the effect on FRELIMO vote share was 4.6 percentage points (from a mean of 28.7%). The public goods message also increased the expected change in FRELIMO vote share (relative to the prior election) by 7.4 percentage points (from a mean of -4.4%).<sup>11</sup> This is despite the fact that the municipal government which had provided these public goods was controlled by the main opposition party (RENAMO), which may reflect the ruling party’s ability to claim credit for public goods (Aker, Collier, & Vicente, 2017; Cruz &

<sup>10</sup>This question was asked to our sample respondents referring to other property owners, as a way to decrease the sensitivity of the question and reduce any response biases.

<sup>11</sup>Specifically, these questions asked “Think about all the property owners in the city. What percentage of them do you think voted for FRELIMO in the municipal elections of 2018?” and “What percentage of them do you think plan to vote for FRELIMO in the next municipal elections?”



Figure 2: Effects on contribution to public goods (game)



(a) By baseline public good provision

(b) By partisanship

Figure 2a shows coefficients and corresponding confidence intervals of 95% and 90% from regressing an indicator for whether respondents contributed to the public goods game on treatment group dummies, separately for respondents scoring below vs. above the median on an index of baseline public good provision. Figure 2b shows coefficients and corresponding confidence intervals from the same regression, separately by whether respondents report having voted for RENAMO in the 2018 municipal and 2019 national elections, or not. In both panels, dummies are included for “public goods,” “local autonomy,” and “both” rather than plotting the interaction term; this is to facilitate comparing outcomes for each group relative to the control group. City block fixed effects are included in all regressions. The correlation between the above-median baseline public goods dummy and the RENAMO voter dummy is 0.015.

Schneider, 2017).

We note however that respondents' own stated voting intentions as measured through the mock ballots cast by respondents were less responsive to the public goods message than to the local autonomy message. Local autonomy moved them towards RENAMO or MDM (the national-level opposition parties), not FRELIMO. Note that in the control group, as expected, support for the opposition is higher at the municipal level (54%) than in the provincial or national level (47% and 44%, respectively). The local autonomy message increased support for the opposition in both provincial and national governments to the level enjoyed by the municipal government. (It should be noted that while these effects are only significant for the local autonomy message, point estimates are also positive for the public goods message, and not significantly different from the local autonomy coefficients.) While this table shows results on voting intentions as measured through the mock ballot exercise, Table A.3 shows similar results on survey responses. Support for the ruling party fell commensurately (see Table A.4).

Table 3: Effects of treatment on political outcomes

	Satisfaction with government		Expected vote share for FRELIMO		Vote for RENAMO or MDM		
	Municipal	National	2023	$\Delta 2018 \rightarrow 2023$	Municipal	Provincial	National
Public goods	0.077** (0.038)	0.099** (0.043)	0.046* (0.024)	0.074*** (0.027)	0.029 (0.045)	0.061 (0.046)	0.062 (0.046)
Local autonomy	0.001 (0.038)	-0.003 (0.043)	0.024 (0.024)	0.027 (0.027)	0.047 (0.045)	0.080* (0.046)	0.112** (0.046)
Public goods $\times$ Local autonomy	-0.080 (0.054)	-0.125** (0.061)	-0.038 (0.033)	-0.047 (0.038)	-0.045 (0.063)	-0.084 (0.065)	-0.096 (0.064)
N	922	922	763	727	863	856	858
Mean (control group)	0.707	0.462	0.287	-0.044	0.543	0.466	0.440
p-val: T1=T2	0.043	0.018	0.341	0.071	0.697	0.675	0.265
p-val: T1 + T2 + T1 $\times$ T2 = 0	0.957	0.515	0.173	0.044	0.491	0.217	0.088

Coefficients from the regression specified in Equation 1, with standard errors shown in parentheses. 'Satisfaction with government' indicates that the respondent answered 'Very satisfied' or 'Satisfied' to the question 'In general, are you satisfied with political governance in [the municipality of Quelimane / Mozambique]?' 'Expected vote share for FRELIMO' refers in the left column to the respondent's answer to the question 'Think about all the homeowners in the city. What percentage do you believe plan to vote for FRELIMO in the next municipal elections?'. The right column of this category refers to the difference between the respondent's answer to the aforementioned question and their answer to the question 'Think about all the homeowners in the city. What percentage do you believe voted for FRELIMO [in the municipal elections of 2018]?'. 'Vote for RENAMO or MDM' indicates that the respondent submitted a ballot on which they checked the box next to 'RENAMO' or 'MDM' for the stated level of government (defined for respondents who submitted any ballot). All regressions include block fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 5 Conclusion

Increasing municipal revenues in the developing world is of vital importance for improving the quality of public goods and services, and ultimately for boosting economic growth. But governments face both resource and political constraints to strengthening enforcement, pointing to the necessity of finding ways to raise voluntary tax compliance (tax morale). In this paper, we show that communication highlighting the local government's existing efforts at providing public goods can engender greater property tax morale among property owners, especially those for whom the information may be surprising given their own poor experience of public good provision. Meanwhile, highlighting local political autonomy increases support for the opposition party but only raises tax morale for strong co-partisans, reversing the gains of the public goods message for everyone else.

These results carry important policy implications for governments seeking to raise revenue without losing political support. Effective communication about the government's public goods successes offers a relatively low-cost way to provide a positive shock to people's perceptions of the social contract. Our results about the heterogeneity of effects by citizens' prior experience of public goods suggest that targeting information to those most likely to update their beliefs could make these interventions even more cost-effective. Ideally, this positive shock could lead to a virtuous cycle, as governments use increased revenues to improve the quality of public goods and services, which in turn further boosts citizens' tax morale. However, the public goods communication is not particularly effective at producing political support, countering the importance of electoral accountability. The opposite happens with the explicit political autonomy message, which we wrongfully hoped would trigger reciprocity and increase tax morale. Together, these results hint incumbent politicians to separate the messages: while public goods marketing should be used for boosting tax adherence in times of policy-making, branding autonomy should probably be left to the political campaign periods. Political communication is art.

## References

- Acemoglu, D., Cheema, A., Khwaja, A. I., & Robinson, J. A. (2020). Trust in State and Nonstate Actors : Evidence from Dispute Resolution in Pakistan. *Journal of Political Economy*, 128(8).
- Aker, J. C., Collier, P., & Vicente, P. C. (2017). Is Information Power? Using Mobile Phones and Free Newspapers during an Election in Mozambique. *The Review of Economics and Statistics*, 99(2), 185–200. doi: 10.1162/REST\_a\_00611
- Alm, J., Jackson, B. R., & McKee, M. (1993). Fiscal exchange, collective decision institutions, and tax compliance. *Journal of Economic Behavior & Organization*, 22(3), 285–303.
- Almunia, M., Henning, D. J., Knebelmann, J., Nakyambadde, D., & Tian, L. (2023). Leveraging Trading Networks to Improve Tax Compliance: Experimental Evidence from Uganda.
- Arzaghi, M., & Henderson, J. V. (2005). Why countries are fiscally decentralizing. *Journal of public economics*, 89(7), 1157–1189.
- Balán, P., Bergeron, A., Tourek, G., & Weigel, J. L. (2022). Local elites as state capacity: How city chiefs use local information to increase tax compliance in the democratic republic of the congo. *American Economic Review*, 112(3), 762–797.
- Bergolo, M., Ceni, R., Cruces, G., Giacobasso, M., & Perez-Truglia, R. (2023). Tax Audits as Scarecrows: Evidence from a Large-Scale Field Experiment. *American Economic Journal: Economic Policy*, 15(1), 110–153. doi: 10.1257/pol.20200321
- Besley, T. (2020). State Capacity, Reciprocity, and the Social Contract. *Econometrica*, 88(4), 1307–1335. doi: 10.3982/ecta16863
- Besley, T., & Persson, T. (2013, jan). Taxation and Development. *Handbook of Public Economics*, 5, 51–110. Retrieved from <https://www.sciencedirect.com/science/article/pii/B9780444537591000029> doi: 10.1016/B978-0-444-53759-1.00002-9
- Bianchi, N., Giorcelli, M., & Martino, E. M. (2023). The effects of fiscal decentralisation on publicly provided services and labour markets. *The Economic Journal*, 133(653), 1738–1772.
- Biasi, B., & Sandholtz, W. (2024). The Political Consequences of Controversial Education Reform: Lessons from Wisconsin’s Act 10.
- Blimpo, M., Mensah, J. T., Opalo, K. O., & Shi, R. (2018). Electricity Provision and Tax Mobilization in Africa. *World Bank Policy Research Working Paper*(April). doi: 10.1596/1813-9450-8408
- Bott, K. M., Cappelen, A. W., Sørensen, E. O., & Tungodden, B. (2019). You’ve got mail: A randomized field experiment on tax evasion. *Management Science*, 66(7), 2801–2819. doi: 10.1287/mnsc.2019.3390
- Brockmeyer, A., Garfias, F., & Suárez Serrato, J. C. (2024, August). *The Fiscal Contract up Close: Experimental Evidence from Mexico City* [Working Paper]. National Bureau of Economic Research. Retrieved 2024-08-06, from <https://www.nber.org/papers/w32776> doi: 10.3386/w32776
- Brollo, F., & Nannicini, T. (2012, November). Tying your enemy’s hands in close races: The politics of federal transfers in Brazil. *American Political Science Review*, 106(4), 742–761. Retrieved 2017-11-07, from [http://www.journals.cambridge.org/abstract\\_S0003055412000433](http://www.journals.cambridge.org/abstract_S0003055412000433) (Publisher: Cambridge University Press ISBN: 0003-0554\r1537-5943) doi: 10.1017/S0003055412000433
- Bueno, N. S., Zucco, C., & Nunes, F. (2023). What You See and What You Get: Direct and Indirect Political Dividends of Public Policies. *British Journal of Political Science*, 1–20. doi: 10.1017/s0007123423000017
- Butler, A., & Boudot Reddy, C. (2023). Paving the Road to Re-election. *Available at SSRN 4575952*.
- Carrillo, P. E., Castro, E., & Scartascini, C. (2017). Do Rewards Work?: Evidence from the Randomization of Public Works [IDB Publications (Working Papers)]. (8246).
- Castro, L., & Scartascini, C. (2015). Tax compliance and enforcement in the pampas evidence from a field experiment. *Journal of Economic Behavior and Organization*, 116, 65–82. Retrieved from <http://dx.doi.org/10.1016/j.jebo.2015.04.002> doi: 10.1016/j.jebo.2015.04.002
- Collin, M. E., Di Maro, V., Evans, D., & Manang, F. (2021). Property Tax Compliance in Tanzania: Can Nudges Help? *Brookings Global Working Paper*, 10148(September), 1–31. Retrieved from <https://openknowledge.worldbank.org/handle/10986/37913> Licencia:CCBY3.0IG0

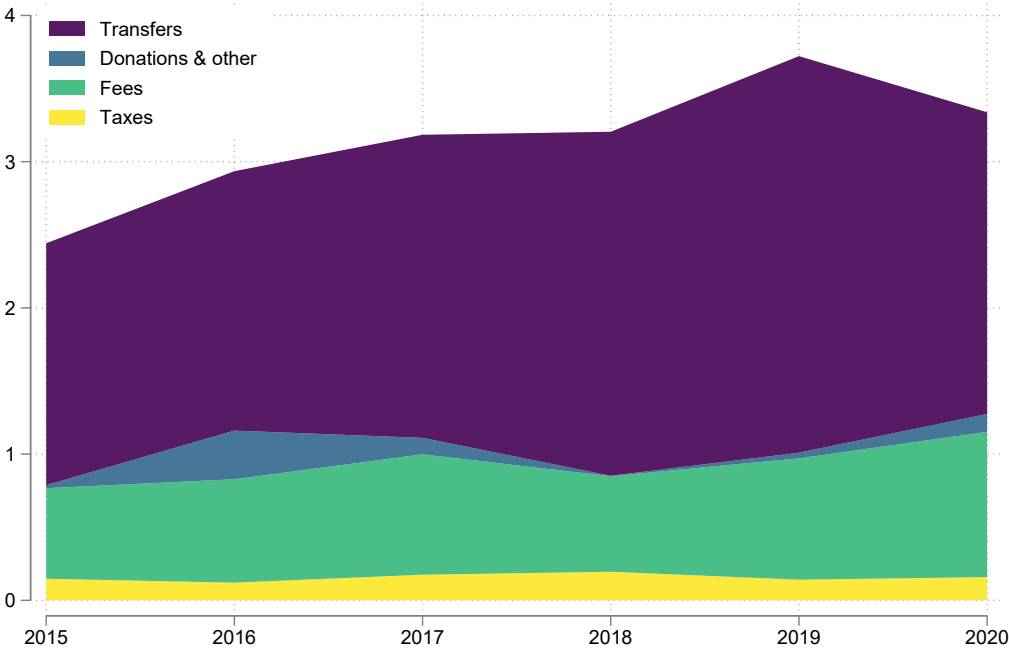
- Coppedge, M., Gerring, J., Knutsen, C. H., Lindberg, S. I., Teorell, J., Altman, D., ... Ziblatt, D. (2024). *V-Dem Codebook v14*. Varieties of Democracy (V-Dem) Project.
- Cox, L., Eyzaguirre, S., Gallego, F. A., & García, M. (2024). Punishing mayors who fail the test: How do voters respond to information about educational outcomes? *Journal of Development Economics*, 103315.
- Cruz, C., & Schneider, C. J. (2017, April). Foreign Aid and Undeserved Credit Claiming. *American Journal of Political Science*, 61(2), 396–408. Retrieved 2017-06-13, from <http://doi.wiley.com/10.1111/ajps.12285> (ISBN: 1540-5907) doi: 10.1111/ajps.12285
- Cullen, J. B., Turner, N., & Washington, E. (2021). Political Alignment, Attitudes Toward Government, and Tax Evasion. *American Economic Journal: Economic Policy*, 13(3), 135–166. doi: 10.1257/pol.20190409
- Dias, M., & Ferraz, C. (2020). Voting for Quality? The Impact of School Performance Information on Electoral Outcomes. *Working Paper*.
- Enikolopov, R., & Zhuravskaya, E. (2007). Decentralization and political institutions. *Journal of public economics*, 91(11-12), 2261–2290.
- Freedom House. (2023). *Freedom in the world 2023: Democracy scores*. Freedom House. Washington, D.C.. Retrieved from <https://freedomhouse.org/report/freedom-world> (Accessed: 2024-08-09)
- Gadenne, L. (2017). Tax me, but spend wisely? Sources of public finance and government accountability. *American Economic Journal: Applied Economics*, 9(1), 274–314. doi: 10.1257/app.20150509
- Garfias, F., Lopez-Videla, B., & Sandholtz, W. A. (2021). Infrastructure for votes? experimental and quasi-experimental evidence from Mexico. *Working Paper*.
- Gonzalez-Navarro, M., & Quintana-Domeque, C. (2015). Local Public Goods and Property Tax Compliance: Evidence from Residential Street Pavement. *Lincoln Institute of Land Policy*(WP15MG1), 1–17. Retrieved from [https://www.lincolninst.edu/pubs/2535\\_Local-Public-Goods-and-Property-Tax-Compliance](https://www.lincolninst.edu/pubs/2535_Local-Public-Goods-and-Property-Tax-Compliance)
- Goyal, T. (2023). Do Citizens Enforce Accountability for Public Goods Provision? Evidence from India's Rural Roads Program. *Journal of Politics*. doi: 10.2139/ssrn.3378451
- Gràcio, M., & Vicente, P. C. (2021). Information, Get-out-the-vote Messages, and Peer Influence: Causal Effects on Political Behavior in Mozambique. *Journal of Development Economics*, 151, 102665.
- Güth, W., Levati, V., & Sausgruber, R. (2005, July). Tax morale and (de-)centralization: An experimental study. *Public Choice*, 125(1), 171–188. Retrieved 2024-08-26, from <https://doi.org/10.1007/s11127-005-3414-7> doi: 10.1007/s11127-005-3414-7
- Hallsworth, M., List, J. A., Metcalfe, R. D., & Vlaev, I. (2017). The behavioralist as tax collector: Using natural field experiments to enhance tax compliance. *Journal of Public Economics*, 148, 14–31. doi: 10.1016/j.jpubeco.2017.02.003
- Henn, S. J., Paler, L., Prichard, W., Samii, C., & Sánchez de la Sierra, R. (2024). *Seeing like a citizen: Experimental evidence on how empowerment affects engagement with the state*. (Working paper)
- Huet-Vaughn, E. (2023). Minimum Wages and Voting: Assessing the Political Returns to Redistribution outside the Tax System.
- Kendall, C., Nannicini, T., & Trebbi, F. (2015). How do voters respond to information? evidence from a randomized campaign. *American Economic Review*, 105(1), 322–353. doi: 10.1257/aer.20131063
- Khan, A., Nasim, S., Shaukat, M., & Stegmann, A. (2021). Building trust in the state with information: Evidence from urban Punjab. *Journal of Public Economics*, 202, 104494. Retrieved from <https://doi.org/10.1016/j.jpubeco.2021.104494> doi: 10.1016/j.jpubeco.2021.104494
- Krause, B. (2020). Balancing Purse and Peace : Tax Collection , Public Goods and Protests.
- Kresch, E. P., Walker, M., Best, M. C., Gerard, F., & Naritomi, J. (2023). Sanitation and property tax compliance: Analyzing the social contract in Brazil. *Journal of Development Economics*, 160(June 2022), 102954. Retrieved from <https://doi.org/10.1016/j.jdeveco.2022.102954> doi: 10.1016/j.jdeveco.2022.102954
- Leeffers, S. (2023). *It Will Rain: The Effects of Information on Flood Preparedness in Urban Mozambique* (Tech. Rep.). Preliminary Working Paper. Helsinki: UNU-WIDER.

- Leff-Yaffe, D., Nakab, A., & Sandholtz, W. A. (2023). The Road to Reelection: 'Political Returns to Highway Construction.
- Luttmer, E. F., & Singhal, M. (2014). Tax morale. *Journal of Economic Perspectives*, 28(4), 149–168. doi: 10.1257/jep.28.4.149
- Marshall, M. G., Gurr, T. R., & Jagers, K. (2023). *Polity IV Project: Political Regime Characteristics and Transitions, 1800-2023*. Center for Systemic Peace. Vienna, VA. Retrieved from <http://www.systemicpeace.org/inscrdata.html> (Accessed: 2024-08-09)
- Okunogbe, O., & Santoro, F. (2023). The Promise and Limitations of Information Technology for Tax Mobilization. *The World Bank Research Observer*, 38(2), 295–324.
- Okunogbe, O., & Tourek, G. (2024). How can lower-income countries collect more taxes? the role of technology, tax agents, and politics. *Journal of Economic Perspectives*, 38(1), 81–106.
- Peltzman, S. (1992). Voters as Fiscal Conservatives. *The Quarterly Journal of Economics*, 107(2), 327–361. Retrieved 2024-08-06, from <https://www.jstor.org/stable/2118475> (Publisher: Oxford University Press) doi: 10.2307/2118475
- Prichard, W. (2018, April). Electoral Competitiveness, Tax Bargaining and Political Incentives in Developing Countries: Evidence from Political Budget Cycles Affecting Taxation. *British Journal of Political Science*, 48(2), 427–457. Retrieved 2024-08-06, from <https://www.cambridge.org/core/journals/british-journal-of-political-science/article/electoral-competitiveness-tax-bargaining-and-political-incentives-in-developing-countries-evidence-from-political-budget-cycles-affecting-taxation/2C83B99205AE78B87A710BE3B21E05C2> doi: 10.1017/S0007123415000757
- Saghir, J., & Santoro, J. (2018, April). Urbanization in Sub-Saharan Africa: Meeting Challenges by Bridging Stakeholders. *Center for Strategic & International Studies (CSIS) white paper*.
- Sandholtz, W. A. (2023). The politics of policy reform: Experimental evidence from Liberia.
- Slemrod, J., Blumenthal, M., & Christian, C. (2001). Taxpayer response to an increased probability of audit: Evidence from a controlled experiment in Minnesota. *Journal of Public Economics*, 79(3), 455–483. doi: 10.1016/S0047-2727(99)00107-3
- The World Bank. (2024). *Gdp per capita (current us\$) - mozambique*. Retrieved from <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=MZ> (Accessed: 2024-09-04)
- Torgler, B. (2005, June). Tax morale and direct democracy. *European Journal of Political Economy*, 21(2), 525–531. Retrieved 2024-08-28, from <https://www.sciencedirect.com/science/article/pii/S0176268004000825> doi: 10.1016/j.ejpoleco.2004.08.002
- Torgler, B., Schneider, F., & Schaltegger, C. A. (2010, July). Local autonomy, tax morale, and the shadow economy. *Public Choice*, 144(1), 293–321. Retrieved 2024-08-28, from <https://doi.org/10.1007/s11127-009-9520-1> doi: 10.1007/s11127-009-9520-1
- UNESCO Institute for Statistics (UIS). (2024). *Uis.stat bulk data download service*. Retrieved from <https://apiportal.uis.unesco.org/bdds> (As cited in World Bank Group, Gender Data Portal, Mozambique. Accessed: 2024-08-24. <https://genderdata.worldbank.org/en/economies/mozambique>)
- United Nations. (2018). The World's Cities in 2018. *World Urbanization Prospects: The 2018 Revision*, 34. Retrieved from [https://www.un.org/en/development/desa/population/publications/pdf/urbanization/the\\_worlds\\_cities\\_in\\_2018\\_data\\_booklet.pdf](https://www.un.org/en/development/desa/population/publications/pdf/urbanization/the_worlds_cities_in_2018_data_booklet.pdf)
- United Nations, Department of Economic and Social Affairs, Population Division. (2018). *World urbanization prospects: The 2018 revision, online edition*. Online Edition. Retrieved from <https://population.un.org/wup/Download/> (Accessed: 15 Feb 2024)
- U.S. Department of State. (2023). *2023 report on international religious freedom: Mozambique*. Retrieved from <https://www.state.gov/reports/2023-report-on-international-religious-freedom/mozambique/> (Accessed: 2024-08-24)

# A Additional tables and figures

## A.1 Municipal budget composition

Figure A.1: Quelimane’s revenue sources (million USD)



Data from Quelimane Revenues Commission. Exchange Rate: 1 USD = 64.12 MZN (as of December 2022).



## A.2 Outcome: text message requesting information or visits

At the end of the survey, we provided a card with a phone number to which respondents could send a text message if they wanted more information or if they wanted to request a visit from tax collectors. This is the language with which this information was presented:

Portuguese	English
<p>Mais uma vez, agradecemos ao Sr/a por ter dedicado o seu tempo a responder a esse inquérito sobre impostos.</p>	<p>Once again, we thank you for taking the time to respond to this survey on taxes.</p>
<p>Vamos deixar consigo um cartãozinho com um contacto que pode usar para obter mais informações.</p>	<p>We will leave with you a card with a contact number that you can use to obtain more information.</p>
<p>Se o/a Sr/a gostaria de receber mais informações sobre como os impostos são coletados e utilizados em Quelimane, pode enviar a palavra "INFO" para esse número (XX XXX XXXX).</p>	<p>If you would like to receive more information about how taxes are collected and used in Quelimane, you can send the word "INFO" to this number (XX XXX XXXX).</p>
<p>Apesar de nós sermos uma equipa de investigação independente, estamos a conduzir esse inquérito com a autorização do município. Se desejar, nós podemos informar o município de que gostaria de receber uma visita dos técnicos da Comissão de Registo de Fontes de Receita para avaliar a sua propriedade. Se quiser o fazê-lo, basta enviar uma mensagem a dizer "VISITA" para esse número (XX XXX XXXX).</p>	<p>Although we are an independent research team, we are conducting this survey with the municipality's authorization. If you wish, we can inform the municipality that you would like to receive a visit from the Revenue Sources Registration Commission's technicians to assess your property. If you would like to do this, simply send a message with the word "VISITA" to this number (XX XXX XXXX).</p>

Table A.1 shows that only a very small number of respondents chose to send these texts, with no distinguishable difference across treatment arms.

Table A.1: Effects on text message requesting information or visits

	Text message: Request info	Text message: Request visit	Text message: Any request
Public goods	-0.004 (0.008)	0.000 (0.005)	-0.004 (0.009)
Local autonomy	-0.003 (0.008)	0.008 (0.005)	0.002 (0.009)
Public goods $\times$ Local autonomy	0.006 (0.012)	-0.004 (0.008)	0.006 (0.013)
N	922	922	922
Mean (control group)	0.009	0.000	0.009
p-val: T1=T2	0.842	0.140	0.517
p-val: T1 + T2 + T1 $\times$ T2 = 0	0.912	0.406	0.705

Coefficients from the regression specified in Equation 1, with standard errors shown in parentheses. The first two columns indicate that the respondent sent a text message to the provided number to request further information about property taxes or a visit from a municipal tax assessor, respectively. The third column indicates that the respondent sent a text message requesting at least one of the above. All regressions include block fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### A.3 Balance

Table [A.2](#) tests balance on baseline characteristics across treatment arms.

Table A.2: Balance

	Control group		Difference with ...			N
	Mean	(SE)	Public goods	Local autonomy	Both	
<b>Demographics:</b>						
Female	0.636	(0.032)	-0.104**	-0.032	-0.067	922
Muslim	0.160	(0.024)	0.037	0.000	0.035	921
Born in Quelimane	0.467	(0.033)	-0.010	0.004	-0.005	922
Literate	0.831	(0.025)	-0.005	0.029	0.003	922
Finished secondary school	0.436	(0.033)	-0.015	0.029	0.008	922
Employment: professional	0.165	(0.025)	-0.015	-0.041	0.002	919
Employment: agriculture	0.147	(0.024)	0.002	-0.009	0.015	919
Unemployed	0.223	(0.028)	-0.051	-0.015	-0.024	919
Weekly income (USD)	26.183	(4.546)	-0.025	3.168	4.709	782
Owner lives at property	0.969	(0.012)	0.025*	0.006	-0.002	921
Has any property document	0.564	(0.033)	-0.035	-0.030	-0.018	922
<b>Property:</b>						
Built by current owner	0.698	(0.031)	-0.015	-0.004	0.005	922
Inhabitants of house	5.332	(0.136)	0.245	-0.036	0.193	911
Earthen floor	0.369	(0.032)	-0.004	0.039	-0.010	922
Metal roof	0.911	(0.019)	-0.003	-0.029	-0.002	922
<b>Taxes:</b>						
Muni. has authority	0.880	(0.022)	0.018	0.035	0.031	922
Gov. uses tax revenue well	0.587	(0.033)	-0.013	-0.006	-0.017	922
Prefer ↑ taxes, services	0.689	(0.031)	-0.024	0.027	0.005	922
Heard of prop. tax	0.213	(0.027)	0.090**	0.040	0.042	922
Property ever assessed	0.062	(0.016)	0.018	0.027	0.018	922
Paid property tax	0.151	(0.024)	0.013	0.036	0.030	922
Share neighbors paid	0.311	(0.027)	-0.020	0.024	-0.006	674
Share owners paid	0.237	(0.020)	-0.007	-0.006	-0.023	669
Belief: Property tax rate	16.589	(1.725)	-1.809	-2.317	-0.207	873
<b>Services:</b>						
Belief: muni. budget	177.242	(111.462)	43.047	41.368	-77.849	591
Share budget transfers	0.322	(0.024)	0.002	0.001	-0.021	606
Gov 'never' collects garbage	0.600	(0.033)	0.002	0.051	0.061*	922
Gov 'never' repairs street	0.524	(0.033)	0.031	0.045	0.048	922
Gov 'never' repairs ditches	0.516	(0.033)	0.074*	0.048	0.039	922
<b>Politics:</b>						
'Never' discusses politics	0.551	(0.033)	-0.013	0.059	0.037	922
Share owners FRELIMO 2018	0.322	(0.023)	-0.024	-0.012	-0.011	748
Voted in 2018 municipal election	0.836	(0.025)	-0.048	-0.023	-0.006	922
Voted FRELIMO in 2018	0.519	(0.039)	-0.035	-0.051	-0.052	663
Voted in 2019 national election	0.742	(0.029)	0.024	-0.001	0.036	922
Voted FRELIMO in 2019	0.608	(0.040)	0.030	-0.010	-0.028	638

'Control group' columns show means and standard error of means for the control group. 'Difference' columns show the coefficient from regressing each variable on a treatment dummy while limiting the sample to the control group and the public goods group, the local autonomy group, or the both group, respectively. All these regressions include block FE. 'N' column shows number of observations for which the variable is non-missing. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## A.4 Effects on other electoral measures

Table A.3: Effects on reported voting outcomes

	Vote for FRELIMO		Vote for RENAMO or MDM		Report voting intention	
	Municipal	National	Municipal	National	Municipal	National
Public goods	-0.003 (0.047)	-0.043 (0.047)	0.028 (0.047)	0.066 (0.047)	-0.011 (0.025)	-0.031 (0.026)
Local autonomy	-0.046 (0.046)	-0.097** (0.047)	0.036 (0.047)	0.084* (0.047)	-0.011 (0.025)	-0.010 (0.026)
Public goods $\times$ Local autonomy	0.047 (0.066)	0.071 (0.067)	-0.032 (0.067)	-0.058 (0.067)	-0.027 (0.036)	0.007 (0.037)
N	830	822	830	822	922	922
Mean (control group)	0.413	0.527	0.549	0.439	0.920	0.916
p-val: T1=T2	0.347	0.245	0.868	0.701	0.995	0.405
p-val: T1 + T2 + T1 $\times$ T2 = 0	0.968	0.146	0.511	0.054	0.052	0.184

Coefficients from the regression specified in Equation 1, with standard errors shown in parentheses. 'Vote for FRELIMO' indicates that the respondent answered 'FRELIMO' to the question 'If the municipal elections were tomorrow, which party would you vote for?' (defined for respondents who did not answer Don't Know or Refuse). 'Vote for RENAMO or MDM' indicates that the respondent answered 'RENAMO' or 'MDM' to this question, with the same restriction. 'Report voting intention' indicates that the respondent gave a response to this question other than 'Don't know' or 'Refuse.' All regressions include block fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.4: Effects on other ballot outcomes

	Vote for FRELIMO			Submit ballot		
	Municipal	Provincial	National	Municipal	Provincial	National
Public goods	0.004 (0.045)	-0.022 (0.046)	-0.015 (0.046)	0.004 (0.021)	0.011 (0.022)	0.011 (0.022)
Local autonomy	-0.039 (0.044)	-0.074 (0.046)	-0.090* (0.046)	0.004 (0.021)	0.012 (0.022)	0.002 (0.022)
Public goods $\times$ Local autonomy	0.023 (0.063)	0.062 (0.065)	0.056 (0.065)	0.000 (0.030)	-0.009 (0.031)	-0.004 (0.031)
N	863	856	858	922	922	922
Mean (control group)	0.400	0.471	0.488	0.933	0.924	0.929
p-val: T1=T2	0.334	0.253	0.103	0.998	0.983	0.682
p-val: T1 + T2 + T1 $\times$ T2 = 0	0.796	0.474	0.295	0.714	0.530	0.700

Coefficients from the regression specified in Equation 1, with standard errors shown in parentheses. 'Vote for FRELIMO' indicates that the respondent submitted a ballot on which they checked the box next to 'FRELIMO' for the stated level of government (defined for respondents who submitted any ballot). 'Submit ballot' indicates that the respondent submitted a ballot. All regressions include block fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## B Information treatments

### B.1 Control condition

The following text was read to all participants:

Portuguese	English
<p>Agora queremos fornecer algumas informações úteis sobre o papel dos impostos no município, particularmente o Imposto Predial Autárquico ou IPRA.</p>	<p>Now we want to provide some useful information about the role of taxes in the municipality, particularly the Municipal Property Tax or IPRA.</p>
<p>Para propriedades residenciais, a taxa do IPRA é 0,04% do valor da propriedade. Isto quer dizer que se uma propriedade tivesse o valor de 1 milhão de meticais, o dono teria de pagar 400 meticais por ano como IPRA.</p>	<p>For residential properties, the IPRA rate is 0.04% of the property value. This means that if a property had a value of 1 million meticais, the owner would have to pay 400 meticais per year as IPRA.</p>
<p>Se for uma propriedade comercial, o valor é de 0,07% do valor da propriedade – uma propriedade comercial com o valor de 1 milhão de meticais teria de pagar 700 meticias por ano como IPRA.</p>	<p>If it is a commercial property, the value is 0.07% of the property value – a commercial property with a value of 1 million meticais would have to pay 700 meticias per year as IPRA.</p>
<p>Pagar o IPRA é necessário para vender a propriedade.</p>	<p>Paying IPRA is necessary to sell the property.</p>
<p>Esses impostos, quando forem pagos, contribuem para o orçamento do município. O orçamento do município é aproximadamente de 500 meticais por município por ano.</p>	<p>These taxes, when paid, contribute to the municipality's budget. The municipality's budget is around 500 meticais per citizen per year.</p>

## B.2 Public good condition

The following text was read to all participants in the “public good” treatment:

Portuguese	English
<p>O “contrato social” significa que os cidadãos têm dizer sobre como os seus governos se comportam. Os cidadãos podem expressar as suas preocupações. Eles pagam impostos em troca dos serviços públicos que são oferecidos pelo governo.</p> <p>Para que o/a Sr/a tenha uma visão mais ampla do comportamento do governo, vamos fazer uma revisão de alguns dos bens públicos fornecidos pelo município nos últimos 10 anos.</p> <p>Várias das artérias críticas da cidade foram reparadas e os seus buracos tapados, por exemplo as avenidas Eduardo Mondlane, Július Nyerere, 7 de Setembro, Josina Machel, Samora Michel, Marginal, Filipe Samuel Magaia, e 25 de Junho. Várias ruas foram pavimentadas ou asfaltadas: Rua Ahmed Sékou Touré que passa no IFP; a Avenida Alberto Cassimo ligando a Sagrada e o mercado de Aquima; e outras nos bairros Kansa, Vilapita, Mapiazua, Brandão, 17 de Setembro, Sangariveira, e Manhaua, entre outras. Foram mantidas as ruas França e Pio Matos, além da manutenção de rotina de estradas de terra batida, bem como o abaulamento numa extensão de mais de 200 kms.</p> <p>Foi construída uma extensão de 22 kms de valas de drenagem, abertas e fechadas.</p> <p>Houve várias outras construções públicas, entre elas</p> <ul style="list-style-type: none"><li>• 2 Bibliotecas Municipais,</li><li>• Escola Primária Completa de Ivagalane,</li><li>• Mercado de Sangariveira.</li></ul> <p>Na área de saneamento, foram construídos:</p> <ul style="list-style-type: none"><li>• 14 Silos para o depósito dos resíduos sólidos,</li><li>• 22 poços de água para os diversos bairros,</li><li>• mais de 100 latrinas para a população carenciada.</li></ul> <p>E foram adquiridos cestos, contentores e camiões de Lixo</p> <p>Também foram atribuídos mais de 2000 DUATs.</p> <p>Agora vou mostrar algumas fotos dos bens públicos do município nos últimos anos.</p>	<p>The “social contract” means that citizens have a say in how their governments behave. Citizens can express their concerns. They pay taxes in exchange for public services that are offered by the government.</p> <p>To give you a broader view of the government’s behavior, let’s review some of the public goods provided by the municipality in the last 10 years.</p> <p>Several of the city’s critical arteries were repaired and potholes filled, for example Eduardo Mondlane, Július Nyerere, 7 de Setembro, Josina Machel, Samora Michel, Marginal, Filipe Samuel Magaia, and 25 de Junho avenues. Several streets were paved or asphalted: Ahmed Sékou Touré which passes by IFP; Alberto Cassimo Avenue connecting Sagrada and Aquima market; and others in the neighborhoods Kansa, Vilapita, Mapiazua, Brandão, 17 de Setembro, Sangariveira, and Manhaua, among others. The streets França and Pio Matos were maintained, as well as the routine maintenance of dirt roads, and the embankment in an extension of more than 200 kms.</p> <p>An extension of 22 kms of drainage ditches, open and closed, was built.</p> <p>There were several other public constructions, among them</p> <ul style="list-style-type: none"><li>• 2 Municipal Libraries,</li><li>• Complete Primary School of Ivagalane,</li><li>• Sangariveira Market.</li></ul> <p>In the area of sanitation, the following were built:</p> <ul style="list-style-type: none"><li>• 14 Silos for the deposit of solid waste,</li><li>• 22 water wells for the various neighborhoods,</li><li>• more than 100 latrines for the needy population.</li></ul> <p>And baskets, containers and garbage trucks were acquired.</p> <p>Also more than 2000 DUATs were awarded.</p> <p>Now I will show you some photos of the public goods of the municipality in the last years.</p>



**B.2.1 Public good condition photos**

Figure B.1



(a) Roads



(b) Firefighters



(c) Drains



(d) More roads

### B.3 Local autonomy condition

The following text was read to all participants in the “local autonomy” treatment:

---

Portuguese	English
<p>Agora, o município tem que usar o seu orçamento para reunir todos os seus gastos, inclusivé os bens públicos que fornece aos municípes.</p>	<p>Now, the municipality has to use its budget to meet all its expenses, including the public goods that it provides to the citizens.</p>
<p>Aproximadamente 70% desse valor vem em forma de transferência do governo central. Algumas pessoas dizem que isso cria uma situação que prejudica a independência política e financeira do município. A ideia é:</p>	<p>Around 70% of this value comes in the form of transfer from the central government. Some people say that this creates a situation that harms the political and financial independence of the municipality. The idea is:</p>
<p>Quando o município depende do governo central para os fundos do seu orçamento, o governo central exerce controlo sobre o município através do controle dos fundos. Se o município está a fazer coisas que o governo central não gosta, o governo central pode reter ou atrasar os pagamentos para tentar influenciar o comportamento do município. Se os objetivos do governo central não são os mesmos que os objetivos do município, isso pode diminuir a autonomia que o município tem de traçar o seu próprio caminho quanto à política.</p>	<p>When the municipality depends on the central government for the funds of its budget, the central government exerts control over the municipality through the control of the funds. If the municipality is doing things that the central government does not like, the central government can withhold or delay payments to try to influence the behavior of the municipality. If the goals of the central government are not the same as the goals of the municipality, this can diminish the autonomy that the municipality has to trace its own path regarding politics.</p>
<p>Numa democracia, os municípes pagam impostos para que o estado funcione e aja a bem do povo. Afinal de contas, os salários dos funcionários públicos não vêm de nenhum partido político, mas do povo que trabalha para poder pagar os seus impostos.</p>	<p>In a democracy, citizens pay taxes so that the state works and acts for the good of the people. After all, the salaries of public servants do not come from any political party, but from the people who work to be able to pay their taxes.</p>
<p>Então, uma maneira importante de garantir a autonomia do município é pagar impostos para que o município tenha a capacidade de realizar os seus planos sem depender do governo central.</p>	<p>So, an important way to guarantee the autonomy of the municipality is to pay taxes so that the municipality has the capacity to carry out its plans without depending on the central government.</p>
<p>Agora vou mostrar algumas fotos tiradas em eventos do governo atual do município.</p>	<p>Now I will show you some photos taken at events of the current government of the municipality.</p>

---

B.3.1 Local autonomy condition photos

Figure B.2



(a) Bikes



(b) A speech



(c) More bikes



(d) Another speech