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## Leveraging religious leaders to increase voluntary tax compliance: Experimental evidence from Tanzania

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# Working Papers

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# Leveraging Religious Leaders to Increase Voluntary Tax Compliance: Experimental Evidence from Tanzania

Jasmin Vietz\*  Ingrid Hoem Sjursen†

May 16, 2025

## Abstract

Non-state actors, such as religious institutions and leaders, play a central role in governance and social life in many low- and lower-middle-income countries. We examine whether information about how tax revenues are used for public goods and service provision increases voluntary tax compliance, and whether religious leaders can serve as more effective senders of this information than tax officials. Using a lab-in-the-field experiment in Tanzania, we find that providing information increases participants' compliance, but only when delivered by a religious leader. These findings highlight the potential of religious leaders in enhancing tax compliance where trust in state institutions is limited.

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# 1 Introduction

Mobilizing government revenue through taxation is fundamental for governments' ability to promote social and economic development through provision of public goods and services. While high-income countries rely on effective tax systems with third-party reporting of information and strong enforcement mechanisms, many low- and lower-middle-income countries<sup>1</sup> (LLMICs) face significant challenges in tax collection (Almunia et al., 2022; Carrillo et al., 2017; Jensen, 2022; Kleven et al., 2016; Naritomi, 2019; Pomeranz, 2015; Prichard, 2022; Waseem, 2023). Thus, increasing *voluntary* tax compliance—where taxpayers pay taxes in the absence of direct enforcement—is a critical policy goal in many LLMICs.

In such contexts, non-state actors may be well positioned to support efforts to enhance voluntary tax compliance, as they play a significant role in governance, service provision, and public communication in many LLMICs (Balan et al., 2022; Baldwin, 2016; Basurto et al., 2020; Grieco, 2024; Gottlieb et al., 2025; Henn, 2023; Seabright, 2024). Among non-state actors, *religious* institutions and leaders stand out as especially influential, particularly in sub-Saharan Africa (Avadeenko et al., 2024; Becker et al., 2025). Surveys consistently show that religion is highly important in daily life for many individuals in the region, and religious leaders often serve as trusted figures who communicate on public affairs, including governance and morality (Afrobarometer, 2021; Becker et al., 2025; Panin, 2021; Pew, 2024). Previous research furthermore shows how information provided by religious leaders and religiously framed information influence a range of behaviors with respect to health, repayment of loans, and business decisions (e.g., Avadeenko et al., 2024; Bursztyn et al., 2019; Butinda et al., 2023). Given their credibility and reach, religious leaders may therefore serve as more effective messengers for promoting tax compliance than government officials, but we know little about their impact.

Against this background, we ask whether information about tax revenue being used to finance provision of public goods and services (tax benefits) influences individuals' willingness to comply with taxes, and whether the effectiveness of such messaging depends on whether the information comes from a tax official or a religious sender. To answer these questions, we conduct a lab-in-the-field experiment in Dar es Salaam, the largest city in Tanzania. Tanzania is an ideal setting for studying the role of religious leaders in promoting tax compliance for several

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<sup>1</sup>We follow the [World Bank country classification by income](#).

reasons. First, Tanzania’s tax system faces persistent challenges in revenue mobilization, particularly among informal sector workers who contribute minimally to the formal tax base. Like in many LLMICs, low tax compliance and weak enforcement are persistent challenges in the country (Buluba et al., 2025; Collin et al., 2025; Fjeldstad et al., 2020; Ongwamuhana, 2011). Second, citizens have limited trust in formal institutions and high trust in religious leaders.<sup>2</sup> Third, the country has a vibrant religious landscape, with both Christian and Muslim leaders and institutions playing significant roles in shaping public opinion, citizens behavior, and governance. Religious leaders frequently engage with their communities on social and political issues, making them potentially influential messengers for tax-related information.<sup>3</sup> Given these conditions, Tanzania provides a unique opportunity to assess whether religious leaders can enhance voluntary tax compliance. In an pre-registered and incentivized lab-in-the-field experiment, we recruited businesspeople from market places around the city. We randomly assigned them to either receive information highlighting that tax revenues finance public services (“tax benefits information”) or to receive no information (control group). Within the group receiving tax benefits information, we vary the identity of the sender of information. One half receives information from a tax official and the other half receives information from a religious sender. After the intervention, we measure participants’ voluntary tax compliance by employing an incentivized Tax Evasion Game (Alm and Malézieux, 2020).

Four main findings emerge. First, information about tax benefits significantly increases voluntary tax compliance. Participants who receive such information report 6.7 percentage points more of their income compared to the control group, translating to a 30 percent increase in voluntary tax compliance. Second, the effectiveness of the message crucially depends on the sender. Individuals who receive tax benefits information from a religious leader exhibit an 8.4 percentage point increase in compliance, while the effect of the tax official is small and not statistically significant. Third, the information from the religious leader is most effective when

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<sup>2</sup>According to the 2021 Afrobarometer Survey, only 50 percent of respondents trust the Tanzania Revenue Authority (TRA) a lot, or somewhat (Afrobarometer, 2021). In comparison, 80 percent of respondents have a high trust in religious leaders.

<sup>3</sup>Some examples are the engagement of religious leader in the discussion of new investors for the country’s biggest port (The Citizen, 2023), and the engagement of the Interfaith Committee in the draft for the Country’s development vision (The Citizen, 2025). Another example of the interconnection between religion and public policy in the country is [TRA’s organization of Iftar](#) (the fast-breaking evening meal of Muslims in Ramadan) where the Deputy Chief Qadi (leader of the court dealing with Islamic personal law) of Tanzania participated, and called on Tanzanians to pass on the culture of paying taxes voluntarily to their children. During the same event, the general commissioner of TRA also called on Muslims and Christians in the country during the period of fasting when spending is high, to always request receipts for every purchase made for the development of the country.

participants perceive it as novel, indicating that the intervention works primarily by introducing new knowledge rather than reinforcing existing beliefs. Finally, the religious sender's influence is particularly pronounced among participants with lower education levels and among Muslim respondents. We interpret our results to highlight the potential of leveraging trusted non-state actors, such as religious leaders, to enhance voluntary tax compliance.

Our study relates to several strands of literature. First, it is connected to research examining the role of non-state actors in tax collection, highlighting how local authorities, chiefs, and other non-state actors shape taxpayer behavior (Callen et al., 2024; Jensen and Weigel, 2024). Chiefs have been shown to be more effective tax collectors than tax officials in the DRC because they use local information to target households with high payment propensities (Balan et al., 2022). Further, improved collaboration between the chiefdom and the local government increased compliance in Sierra Leone due to both higher coercive capacity and accountability of the chiefdom (Grieco, 2024). Gottlieb et al. (2025), on the other hand, found no difference in business registration between a tax appeal letter that was delivered by the tax authority or the market place association (non-state institution) in Nigeria. We contribute to this strand of the literature by studying whether *religious* leaders can play a role in enhancing tax collection. In doing so, we also contribute to the broader literature on tax compliance (see Slemrod (2019) for a review) and the specific challenges of taxation in LLMICs (Jensen and Weigel, 2024; Okunogbe and Santoro, 2023; Okunogbe and Tourek, 2024).

Second, we relate to the literature suggesting that taxation forms the basis of a fiscal contract between state and citizen: citizens concede to pay tax in return for government provision of public goods and services (Besley, 2020; Brautigam et al., 2008; Levi, 1988; Moore et al., 2018). In particular, our paper relates to the literature documenting mixed effects of (information about) provision of public goods and services on tax compliance (Bergolo et al., 2023; Bott et al., 2020; Brockmeyer et al., 2024; Carrillo et al., 2017; Collin et al., 2025; Cohen, 2023; Khan et al., 2022; Krause, 2024; Mascagni and Nell, 2022; Montenbruck, 2023). We contribute by showing that religious leaders might be more effective senders of information about public goods and service provision than tax officials.

Third, our paper contributes to the literature on religion and economics (Becker et al., 2024, 2025; Seabright, 2024). Previous work has shown that religion, religious institutions and re-

religious leaders influence a wide array of outcomes including economic and financial behavior (Bryan et al., 2020; Bursztyn et al., 2019; Butinda et al., 2023) and inequality acceptance (Almås et al., 2022).<sup>4</sup> Religious priming and religiosity have also been shown to affect behavior in public goods and trust games (Auriol et al., 2021; Benjamin et al., 2016; Dhami et al., 2024; Kirchmaier et al., 2018), and be positively correlated with tax compliance behavior (Hwang and Nagac, 2021) and attitudes (Torgler, 2006) (though Khalil and Sidani (2020) find no significant association between religiosity and tax evasion attitude).<sup>5</sup> However, to our knowledge no study has causally investigated whether religious institutions and leaders can enhance tax compliance. We contribute to the literature by showing that religious leaders can be leveraged to increase tax compliance through their communication of information about tax benefits.

Fourth, we contribute to studies that explore the determinants of tax morale in Africa, which have so far mainly relied on self-reported attitudes towards tax compliance (e.g., Ali et al., 2014; Ali and Fjeldstad, 2023; Besley, 2020; Kouamé, 2021; Luttmer and Singhal, 2014; McCulloch et al., 2021; Mascagni and Santoro, 2023; Prichard, 2022). We implement an incentivized Tax Evasion Game, allowing us to capture the observed *behavior* of respondents. Finally, we contribute to the lab experimental literature (Alm and Malézieux, 2020; Friedland et al., 1978; Mascagni, 2018) by investigating a non-student sample in a non-WEIRD (Western Educated Industrialized Rich Democratic) country (Henrich et al., 2010).

The rest of the paper is structured as follows. Section 2 outlines the experimental design. Section 3 provides details on the sample and the setting of the study. The empirical strategy is described in section 4. In section 5 we discuss our main results before digging deeper into potential mechanisms. Section 6 concludes.

## 2 Experimental Design

This section outlines the design of our lab-in-the-field experiment. We first describe the sequence of events in the experiment and the main outcome: compliance in the Tax Evasion Game. Furthermore, we explain our information treatment in more detail. The complete in-

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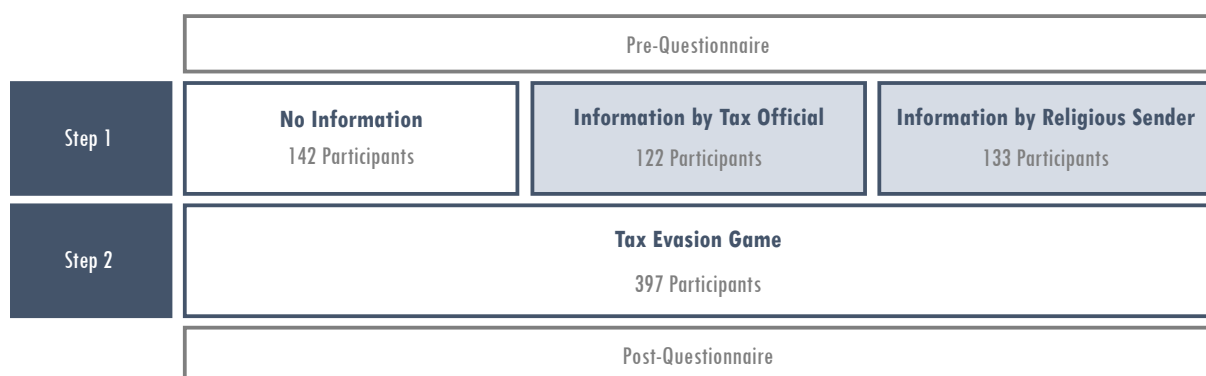
<sup>4</sup>See Avadeenko et al. (2024) for an excellent review of the literature.

<sup>5</sup>Falco et al. (2024) found that a religious message had no significant effect on dishonesty of Tanzanian children. Apart from the age of the participants, our design differs from Falco et al. (2024) on several aspects that may explain the diverging effects of the religious messages.

structions can be found in the [Online Appendix](#).

**Sequence of events** In the beginning, participants consent to the study and complete a short pre-questionnaire capturing basic demographic characteristics. This is followed by the main part of the experiment which consists of two steps (see Figure 1). In step one, participants are randomized into information treatments at the individual level.<sup>6</sup> We consider three groups: participants that receive information about tax benefits by a tax official, participants that receive the same information by a religious sender (treatment groups), and participants that receive no information about tax benefits (control group). In step two, participants take part in a Tax Evasion Game. The experiment concludes with a post-questionnaire about attitudes towards taxation and satisfaction with public goods and service provision.

Figure 1: Experimental Design



*Note:* The figure illustrates the sequence of events of the experiment.

**Main Outcome** Our main outcome is the choice participants make in a Tax Evasion Game. Tax Evasion Games have been extensively used in previous research on tax compliance (see Alm and Malézieux (2020) for a review), and consist of two stages. In the first stage, participants receive an income of 10,000 TZS ( $\approx$  4 USD). In the second stage, they are informed that this income is subject to a tax of 20% and that this tax payment will be added to the tax revenue of Tanzania, contributing to the country's national budget.<sup>7</sup> Participants are asked to

<sup>6</sup>Participants were not allowed to talk to each other during the session, which is why we are not concerned about spillover effects between participants.

<sup>7</sup>Rates for personal income tax in Tanzania range between 0 and 30%. Individual traders with annual turnover below TZS 100 million pay presumptive taxes on turnover, see [Tanzania Revenue Authority](#) for details. The tax revenue collected during the experiment was transferred to the national budget of Tanzania by the researchers in form of a donation to the Prime Minister's Office (PMO)-Disaster Response Unit in September 2024. In addition, participants played a second Tax Evasion Game where the tax was designated to a local health organization. Which of the two Tax Evasion Games was paid out was determined at random.

report their taxable income. They can choose to report any amount between zero (full evasion) and 10,000 TZS (full compliance), in steps of 1,000 TZS. The reported income remained private information.<sup>8</sup> Participants only pay tax on reported income, unreported income remains untaxed. Our main outcome is the participant's tax compliance rate, i.e., the share of reported income over received income. The payment participants receive from the Tax Evasion Game equals their net income, i.e., the received income minus the tax payment, which depends on income reported:

$$\text{Net Income} = 10,000 - (0.2 * \text{Reported Income})$$

There are no audit or other enforcement mechanisms incorporated in our version of the Tax Evasion Game. Hence, we measure *voluntary* tax compliance. This design choice comes with two additional advantages: First, it simplifies the instructions considerably. Given that we have a general population sample where the majority of participants have not completed more education than primary school, reducing the complexity of the task was important. Second, because Tanzania is a low enforcement environment where the authorities' capacity to detect and punish tax evasion is limited, the absence of audits and punishments are closer to participants' reality.

**Tax Benefits Information** To study the effect of information about the use of tax revenue for public goods and services, we randomly assign participants to one of three groups. In the first group, participants receive no information on the use of tax revenue. In the other two groups, participants view a picture of a health service as a public service provision together with a text (in Kiswahili) explaining that the service is financed by tax revenue (see Figure 2):

**Tax payments facilitate provision of important health infrastructure and services.**

**PAY TAX - DEVELOP OUR COUNTRY.**

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<sup>8</sup>To ensure full anonymity, participants receive their payment in a sealed envelope. Neither the instructor nor the other participants in the room know how much money is in the envelope. Envelopes are prepared by a third person that only knows a random number assigned to the participant and the amount he or she reported.

Figure 2: Treatments: Tax Benefits Information



*Note:* Participants in the Religious Sender treatment see one of the two pictures on the right, depending on whether they are Christians (middle) or Muslims (right). Participants in the control group see no picture.

We designed the information intervention to resemble the illustrations that the Tanzania Revenue Authority provides on its [homepage](#). These illustrations feature pictures of public services and infrastructure such as clean water, roads and bridges, and a text that explains that tax revenue facilitates the provision of these services. Some of the illustrations also include the slogan “Pay tax to build our Nation”.<sup>9</sup> We chose to focus on provision of health services because it is a public service that most citizens have encountered and benefited from (whereas, e.g., education is most relevant for people with children, and specific roads and bridges mostly serve people who can make direct use of them).

The information intervention features the drawing of a man with identical facial expression and facial hair across treatments.<sup>10</sup> We only vary the clothing: In the Tax Official Sender treatment, the man is wearing a formal shirt and a tie in the colors of the Tanzania Revenue Authority (TRA) and a stylized TRA logo. In the Religious Sender treatment, the man is dressed as a priest or as an imam (depending on the participant’s religion).<sup>11</sup> We verified that participants recognize the tax official and the religious leaders as such in focus group discussions with participants from a similar sample as participants in our main experiment (market traders in Dar es Salaam). In sum, we hold the content of the information (background picture, features

<sup>9</sup>An example of these illustrations can be found in Figure D.1 in the Appendix.

<sup>10</sup>We chose not to vary the gender of the sender of information for two reasons. First, in many religious denominations, women cannot be formal religious leaders. Second, we did not have the sample size to ensure sufficient power for tests of the effect of the gender of the sender.

<sup>11</sup>While it would also be interesting to study the effect of the Christian religious sender on Muslims and vice versa, we chose to endogenously assign participants to their own religion for power reasons. Only three participants in our sample stated that they have no or another religion. None of these three participants were randomized into the Religious Sender treatment.

of the man, and written text) constant while varying the identity of the sender only.

### 3 Sample and Setting

Participants in this study were businesspeople, more specifically market traders. These markets comprise many small shops, each managed by one single market trader. Typically, people buy food and all other goods, such as clothes and household items, from these market traders. Market traders are liable to different tax-like payments to different actors, and those with a larger turnover are liable to pay presumptive tax to the national government (Edslev, 2024; Jacobsen, 2023; Siebert and Mbise, 2018).<sup>12</sup> Hence, participants have some experience with payment of various types of taxes.

We recruited market traders from 16 different markets in Dar es Salaam (see Table D.1 in the Appendix). In each market, we randomly selected 50 market traders on the basis of the official trader’s list, with the help of market leaders.<sup>13</sup> Participants were invited the day before the study and were informed about a 30,000 TZS participation compensation.<sup>14</sup> If they were willing to participate (98% of invited individuals), they were assigned a specific time at which they had to be present at the market on the following day. On the day of the experimental session, a bus service was arranged to transport participants from their respective markets to the study location, and they were returned to their markets afterwards. This streamlined the participation process, making it convenient for market traders to participate. Within each market, we divided participants into two separate sessions with up to 25 participants each. Sessions with participants from the same market were scheduled consecutively on the same day and the second group was picked up before the first group returned. This ensured that participants did not interact with one another until everyone from the same market had completed the study.

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<sup>12</sup>More specifically, all traders are expected pay a levy to the market (“ushuru/tozo”), services fees (“ada”) for security, waste collection etc., and rent (“kodi ya pango”) to the market council or owner. In addition, traders with annual turnover between TZS 4 and 100 million pay presumptive tax (“kodi ya mapato”) on turnover to the central government.

<sup>13</sup>The traders list, managed by the market committee, contains the names of all traders in a market. To select participants, the total number of names  $N$  on the traders list was divided by 50, and then every  $N/50$ th trader was invited to take part in the study. The market leaders received a 30,000 TZS (12 USD) compensation for their time. In total, we recruited 795 participants. Of these 398 were subjected to an information treatment designed to answer a separate research question. This information treatment unexpectedly affected behavior in the Tax Evasion Game. In this paper, we therefore report the results from the 397 participants who were not subjected to the additional information treatment. See Appendix B and Fjeldstad et al. (2025) for more information.

<sup>14</sup>Some participants received a slightly higher compensation (up to 34,000 TZS), depending on their choices in the elicitation of their willingness to pay to receive the compensation as cash vs. mobile money.

The experiment was conducted on the premises of [REPOA](#), a leading independent Tanzanian research institution. Upon arrival, participants were greeted outside the conference hall where the experiment was conducted. They were asked to enter the room one by one, draw a number from the box by the entrance, sit down at the desk with the corresponding number and wait for further instructions without using their phones or communicating with other participants. When all the participants were seated, the enumerators asked them to complete an electronic survey on the tablet handed out to them. The enumerators also explained that the answers and decisions made in the study would be treated confidentially. If the participants had questions about the survey or encountered any issues, they could raise their hand and get help from one of the enumerators.

In addition to their participation compensation, participants received up to 10,000 TZS as their net income from the Tax Evasion Game (see Section 2 for details). Depending on their reporting decisions, participants thus received a payment between 38,000 and 44,000 TZS (15-19 USD). Given that the average daily income of market traders in Dar es Salaam ranges between 9,200 TZS and 34,000 TZS (Siebert and Mbise, 2018), these were substantial financial incentives. On average, the survey took half an hour to complete. Including travel and payment distribution, participants were occupied for approximately two hours.

Column (1) of Table 1 reports descriptive statistics for our sample. 41% of participants are Christian and 59% are Muslim. While there are no official statistics on religious demographics in Tanzania, the distribution between Muslims and Christians in our sample is quite close to the Afrobarometer (2021) from Dar es Salam (37% Christian and 63% Muslims). Approximately one third of participants have more than primary education. The median age in the full sample is 41 with 42% of participants aged above this median. With 44%, the share of females is slightly lower than the share of males. Columns (2) to (5) report the p-values of the mean comparisons between the control and treatment groups, and show that the sample is balanced in terms of religion, education and gender – both when considering the two tax information treatments together and separately by the tax official and the religious sender (see Table C.1 in the Appendix). Participants in the group receiving tax benefits information from a religious sender are older than those in the control group, but this difference is significant only at a 10% level. We account for this slight imbalance by including age as a control in our main specification.

Table 1: Descriptives and Balance

	Mean	p-value of t-test			
	Full	C vs Info	C vs TS	C vs RS	TS vs RS
Christian	0.41 (0.02)	0.578	0.786	0.234	0.158
More educ	0.33 (0.02)	0.759	0.660	0.370	0.197
Female	0.44 (0.03)	0.763	0.752	0.426	0.282
Older	0.42 (0.02)	0.134	0.382	0.093*	0.449

*Notes:* “Christian”: indicator variable taking the value of one for Christians and zero for Muslims (232 individuals) and individuals with no or another religion (3 individuals). “More educ”: indicator variable taking the value of one if respondent has more education than completed primary school and zero if the respondent has completed primary school or less education. “Female”: indicator variable taking the value of one for female respondents and zero for male respondents. “Older”: is an indicator variable taking the value of one for respondents older than the median age in the sample (41 years). Column (1) reports means and standard errors (in parentheses) for the sample. Columns (2) to (5) report p-values of a balancing test between the different groups: Control vs. Tax benefits information (C vs Info), Control vs. Tax benefits information by tax official (C vs TS), Control vs. Tax benefits information by religious sender (C vs RS), and Tax benefits information by tax official sender vs. Tax benefits information by religious sender (TS vs RS). \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 4 Empirical Strategy

This section describes our empirical strategy. The main outcome of interest is the participant’s tax compliance rate  $y_i$ , i.e., the share of reported income in the Tax Evasion Game, which takes values between 0 (fully non-compliant) and 1 (fully compliant), in steps of 0.1. We estimate robust standard errors throughout.

### 4.1 Main Analysis

To test the hypothesis that providing information about tax benefits increases compliance, we estimate the following OLS regression:

$$y_i = \alpha + \beta \text{Information}_i + \gamma \mathbf{X}_i + \varepsilon_i \quad (1)$$

where  $\text{Information}_i$  is an indicator taking the value of one if the participant received information about tax benefits (Tax Official Sender and Religious Sender treatments) and zero otherwise.

We estimate Equation (1) with and without control variables and session fixed effects. The specifications with controls  $\mathbf{X}_i$  include indicator variables for completion of more than primary school (*More educ*), age above the median of the sample (41 years, *Older*), gender (*Female*) and religion (*Christian*).<sup>15</sup>

We estimate the following OLS regression to test the hypothesis that the sender of the information matters:

$$y_i = \alpha + \beta_1 \text{Tax Official Sender}_i + \beta_2 \text{Religious Sender}_i + \gamma \mathbf{X}_i + \varepsilon_i \quad (2)$$

where  $\text{Tax Official Sender}_i$  is one if participant  $i$  received information about tax benefits from a tax official sender and zero otherwise, and  $\text{Religious Sender}_i$  is one if participant  $i$  received information about tax benefits from a religious sender and zero otherwise.<sup>16</sup> The vector of controls  $\mathbf{X}_i$  is identical to the one in equation (1).

## 4.2 Heterogeneity Analysis

As specified in the pre-analysis plan, we investigate heterogeneity in treatment effects with respect to gender, age, education, and religion. We do this by estimating equations (3) and (4) for each of these four different variables (labeled as  $\text{Var}_i$  in the equation below).

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<sup>15</sup>In addition to the pre-specified controls (education, age, gender) we include an indicator for being Christian. Including this indicator does not change the estimation results from equations (1) and (2) (see Table A.4).

<sup>16</sup>To increase power, equation (2) deviates somewhat from the specification in the pre-analysis plan, see section B in the Appendix for a description and the [Online Appendix](#) for estimates of the pre-specified regression.

$$y_i = \alpha + \beta_1 \text{Info}_i + \beta_2 \text{Info}_i \times \text{Var}_i + \gamma \mathbf{X}_i + \varepsilon_i \quad (3)$$

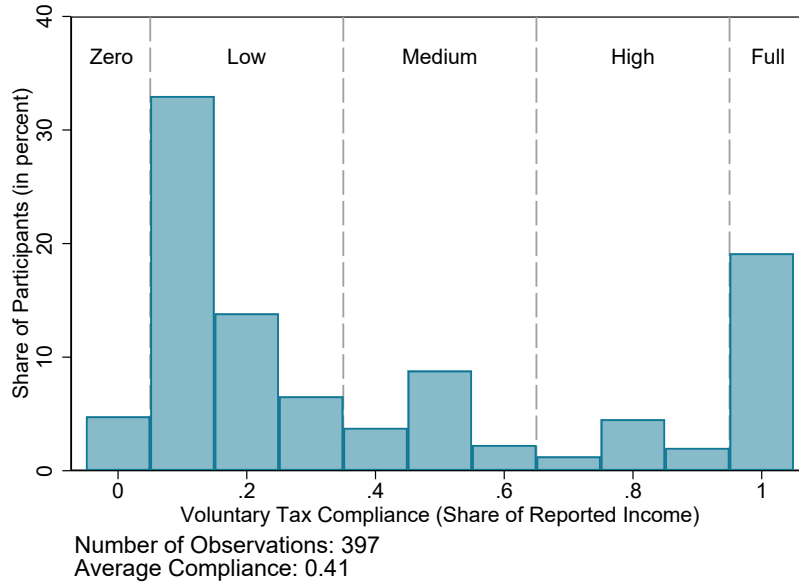
$$\begin{aligned} y_i = & \alpha + \beta_1 \text{Tax Official Sender}_i + \beta_2 \text{Religious Sender}_i \\ & + \beta_3 \text{Tax Official Sender}_i \times \text{Var}_i + \beta_4 \text{Religious Sender}_i \times \text{Var}_i \\ & + \gamma \mathbf{X}_i + \varepsilon_i \end{aligned} \quad (4)$$

## 5 Results

Figure 3 presents the distribution of voluntary tax compliance in the overall sample (control and treatments pooled). It shows that overall compliance is relatively low, with an average of only 41% of income being reported. Fewer than 20% of participants are fully compliant. The proportions of participants demonstrating high (reporting 70% to 90% of income) or medium compliance (reporting 40% to 60% of income) are notably small. Most participants exhibit low compliance, reporting 10% to 30% of income. A marginal fraction of participants (5 %) fully evades taxes and reports zero income. Hence, evasion is widespread, but most participants shy away from evading everything. We interpret this as evidence that most participants perceive tax evasion as acceptable *per se*, even though full evasion appears less acceptable. Participants may feel an obligation to contribute *something*, but may want to keep this contribution as small as possible.

Compared to Alm and Malézieux (2020), who conduct a meta-analysis of 70 studies of the Tax Evasion Game, the observed compliance pattern in our sample is different on several dimensions. First, Alm and Malézieux (2020) find a substantially higher average compliance (65%). Second, they observe higher shares of fully compliant (45%) and fully evading (19%) participants, and point out that there is a general tendency towards all-or-nothing behavior. We have two potential explanations for why our distribution of compliance deviates. First, while the average audit rate among the included studies in Alm and Malézieux (2020) is 20%, we implemented a zero audit probability to measure *voluntary* compliance. Therefore, we expect compliance to be lower. Second, participants in our sample – small business owners from a LLMIC – are quite different from the samples used in many of the papers discussed in Alm and Malézieux (2020). We expect compliance in LLMICs to be lower compared to that in

Figure 3: Distribution of Tax Compliance



*Note:* Distribution of compliance in the full sample. Compliance is measured as the fraction of reported income over total income received.

higher-middle and high income countries since informality and tax evasion are more prevalent in LLMICs (Ohnsorge and Yu, 2022). Survey data also indicates that tax evasion is common in Tanzania. In Afrobarometer (2021), most respondents state that they believe others evade taxes *often*. At the same time, very few respondents indicate that people evade taxes *always* or *never*. This may explain why we observe less extreme all-or-nothing behavior compared to Alm and Malézieux (2020).

## 5.1 Effect of Information

We now investigate the effect of receiving information about the benefits of taxation. To do this, we first pool the Tax Official Sender and the Religious Sender treatment groups together into one *Information* treatment group. Columns (1) and (2) of Table 2 report the results of equation (1) with and without the set of controls, p-values are reported in brackets. The table shows that there is a positive effect of providing information about tax benefits on voluntary tax compliance. Participants receiving the information report 6.7 percentage points more of their income than participants not receiving this information (p-value = 0.077, in the specification including controls in column (2)). Compared to the baseline compliance of 26%, this amounts

to an increase of 25%.<sup>17</sup> This is a large effect, with economic and statistical significance.

**Result 1:** Receiving information about tax benefits *increases* voluntary tax compliance.

Next, we investigate whether the effect of tax benefits information differs by sender. To do so, we differentiate between participants who received information from a religious sender and participants who received information from a tax official sender. Columns (3) and (4) of Table 2 report the results of equation (2) with and without the set of controls. The Tax Official Sender coefficient is positive, but not statistically significant (p-value = 0.293, column (4)). The Religious Sender coefficient is positive, larger in magnitude and statically significant (p-value = 0.059, column (4)). Participants who receive the tax benefits information from a religious sender report 8.4 percentage points more of their income than participants who do not receive any tax benefits information. Compared to the baseline compliance of 26% this is an increase of 32%. Hence, the religious sender amplifies the effects of the information treatment, though the coefficients of the two treatments are not significantly different from each other (see  $\rho^T = \rho^R$  in Table 2).

**Result 2:** Tax benefits information from a religious sender increases voluntary tax compliance.

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<sup>17</sup>There are no significant differences in compliance levels between participants of different education, age, gender and religion (see Table A.4 in the Appendix).

Table 2: Effect of tax benefits information on tax compliance

	(1)	(2)	(3)	(4)
Information	0.063*	0.067*		
	[0.092]	[0.077]		
Religious Sender			0.082*	0.084*
			[0.060]	[0.059]
Tax Official Sender			0.041	0.048
			[0.359]	[0.293]
Constant	0.240**	0.256**	0.241*	0.258**
	[0.047]	[0.043]	[0.051]	[0.045]
Controls		✓		✓
Session FE	✓	✓	✓	✓
$\rho^{RS} = \rho^{TS}$			0.397	0.469
Observations	397	389	397	389
$R^2$	0.119	0.129	0.120	0.130

*Notes:* Dependent variable: compliance rate in the Tax Evasion Game (takes values 0.0, 0.1, 0.2, ..., 1); Independent variables: treatment variable “Information” (takes the value of one for individuals who receive information about tax benefits and zero otherwise) in Column (1) and (2), and on the treatment variables “Religious Sender” and “Tax Official Sender” in Columns (3) and (4), as well as session fixed effects and the background variables “More educated”, “Female”, “Older” and “Christian” (see Table 1 for definitions). P-values in brackets.  $\rho^T = \rho^R$  is the p-value for test of equality of the coefficients of Religious Sender and Tax Official Sender. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Next, we investigate how the information treatments affect the distributions of voluntary tax compliance in Figure 4. Panel (a) shows the difference in compliance rate distributions between the treatment and the control group for both types of senders combined. Panel (b) reports the difference between the Religious Sender treatment group and the control group, while panel (c) displays the corresponding difference for the Tax Official Sender treatment group.

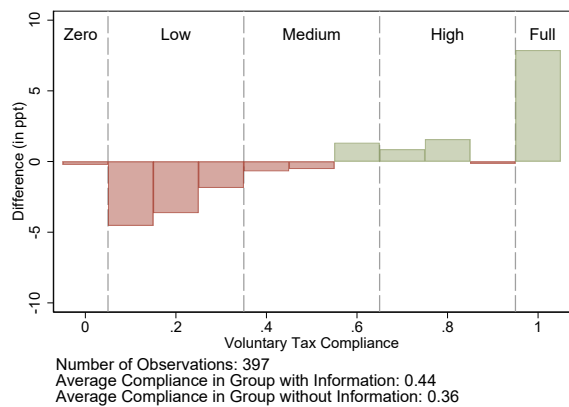
Four points are of notice in panel (a), both types of senders combined. First, overall compliance is higher in the group that received the information, consistent with the results in Table 2. Second, there are both fewer participants with low compliance and more participants with high compliance in this group whereas the share of participants with medium compliance is relatively similar across both groups. Third, the share of fully compliant participants is substantially higher in the group that received the information. Fourth, the share of full evaders – those with zero compliance – is similarly low in both groups (at about 5%).

Following this, we consider the effect of receiving tax benefits information by type of sender

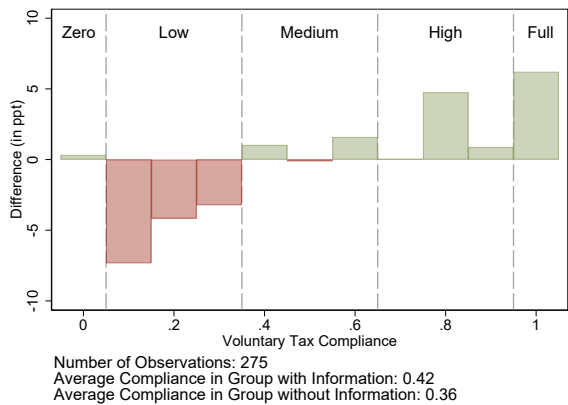
(Panel (b) and (c) of Figure 4). Information from the religious sender shifts participants from the lower end of the compliance distribution to the higher end, but not necessarily all the way to full compliance. Table A.1 in the Appendix shows these dynamics in a regression framework. Receiving tax benefits information from a religious sender significantly increases the likelihood that the participants have a high voluntary tax compliance by 12 percentage points (p-value = 0.043, with controls in column (8)), but does not significantly affect the the likelihood of full voluntary tax compliance as shown in column (4). The effect of information from the tax official, by contrast, shifts participants from low and medium levels to full compliance. However, as shown in Figure 4, these shifts are considerably smaller than those observed in the Religious Sender treatment. Moreover, the Tax Official Sender treatment has no statistically significant effect on indicators for full or high compliance.

To summarize the main results above: (i) information about tax benefits has a positive effect on tax compliance and (ii) these effects are mainly driven by the religious sender, who (iii) increases mean compliance by shifting participants from low to high levels of tax compliance.

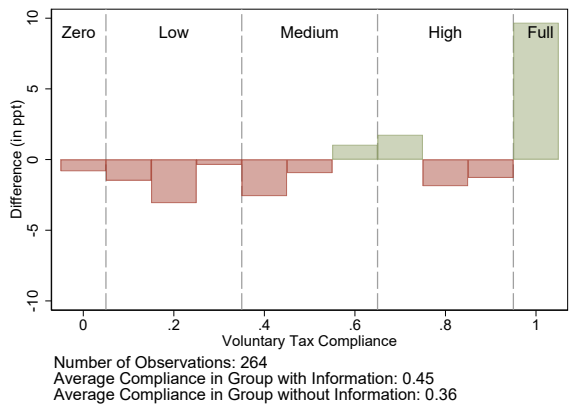
Figure 4: Difference in Density (Treatment vs. Control)



(a) Information (Pooled)



(b) Religious Sender



(c) Tax Official Sender

## 5.2 Mechanisms and Heterogeneity

To study the mechanisms through which the information affects voluntary tax compliance, we investigate if the information treatment has a differential effect on people who say that they gained new information from the treatment in the post-questionnaire as opposed to people who did not. Roughly one third of participants states that the information was novel to them (response: *all* or *mostly* new). Table 3 shows that these participants react strongly, and positively, to the information provided by the religious sender. For the participants who did not perceive the information as novel, neither the religious sender nor the tax official sender affects compliance. The difference in response to the religious sender treatment between participants who perceived the information as novel and those who did not is significant (interaction term, p-value = 0.015). Thus, Table 3 provides evidence suggesting that the treatment affected compliance through providing participants with new knowledge rather than making existing knowledge more salient.<sup>18</sup>

Table 3: Perceived novelty of the information provided

	(1)
Religious Sender	-0.056 [0.390]
Perceived Novel X Religious Sender	0.269** [0.015]
Perceived Novel	-0.136 [0.109]
Religious Sender (Perceived Novel)	0.214** [0.014]
Controls & Session FE	Yes
Observations	248
$R^2$	0.190

*Notes:* Dependent variable: compliance rate in the Tax Evasion Game (takes values 0.0, 0.1, 0.2, ..., 1); Independent variables: “Perceived Novel” (takes value of one if the respondent reports that all or most of the information of the tax benefits treatment was new and zero otherwise), the treatment variable “Religious Sender”, the interaction term between the two “Perceived Novel X Religious Sender” as well as session fixed effects and the background variables “More educated”, “Female”, “Older” and “Christian” (see Table 1 for definitions). “Religious Sender (Perceived Novel)” is the effect of the Religious Sender treatment on the respondents who perceived the information as novel. t P-values in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

<sup>18</sup>As shown in Table A.5, we find no effect of sender of information on the perceived credibility and trustworthiness of the information.

To further explore the effect of information on participant's voluntary tax compliance, we investigate whether the tax benefits information changed their beliefs about the provider of public goods and services (tax benefits beliefs). To determine participants' tax benefits beliefs, we ask an open text question in the post-questionnaire. The precise wording of the question is as follows: *Who finances provision of health infrastructure and services in Tanzania?* We create a *Tax Benefits Beliefs* indicator which equals one if participants answer that public goods and services are (at least partly) financed by the government. 72% of participants report holding such beliefs.

Table 4 examines if our information treatment influences participants' tax benefits beliefs. It shows that receiving the information treatment increases the likelihood of holding tax benefits beliefs. Even though the increase is not statistically significant when both information treatments are pooled, separating between the tax official sender and the religious sender in column (2) reveals a pattern similar to the treatment effects discussed above: Only the information provided by the religious sender increases tax benefits beliefs, though the effect is only weakly significant ( $p\text{-value} = 0.095$ ). We interpret this as further suggestive evidence that the religious sender is more effective than the tax official sender. People update their tax benefits beliefs only if the information comes from a religious sender. If the information comes from a tax official, there is no significant reaction to the information in terms of tax benefits beliefs.

Next, we turn to heterogeneity in treatment effects with respect to the pre-specified dimensions gender, age, education, and religion, again differentiating between the two types of senders.<sup>19</sup> Figure 5 visualizes the coefficients for the effect of the Religious Sender treatment (panel (a)) and the Tax Official Sender treatment (panel (b)) estimated from Equation 4, using separate regressions for each indicator (male, female, younger, older, lower and higher education as well as Christian and Muslim). The effect of information on less educated and Muslim participants seems to be driven by information from a religious sender, while the effect on older respondents, is driven by the information from the tax official sender. The difference in effect between groups is not significant for any of the dimensions studied, as indicated by the non-significant interaction terms of the Table A.3 in the Appendix. Thus, we are careful in putting too much emphasis on the heterogeneity results and consider them an indications for potential mechanisms only.

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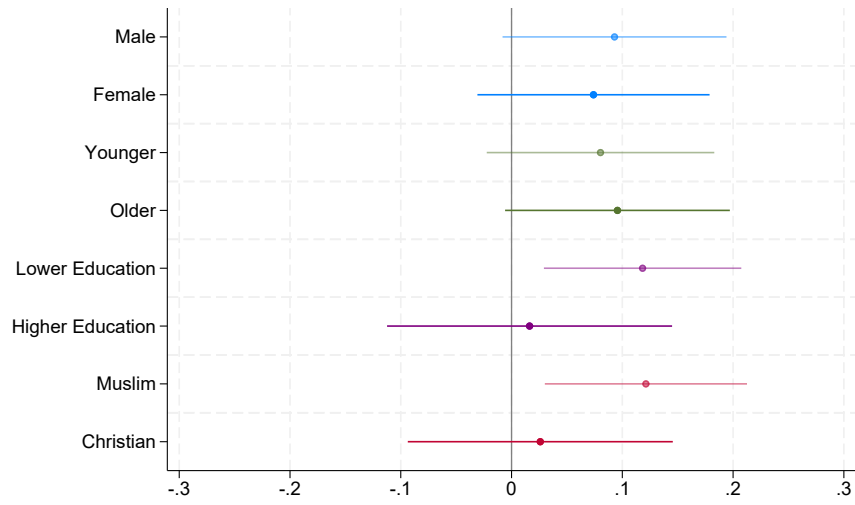
<sup>19</sup>Results for pooling of the two information treatments are reported in Table A.2 in the Appendix.

Table 4: Tax Benefits Beliefs

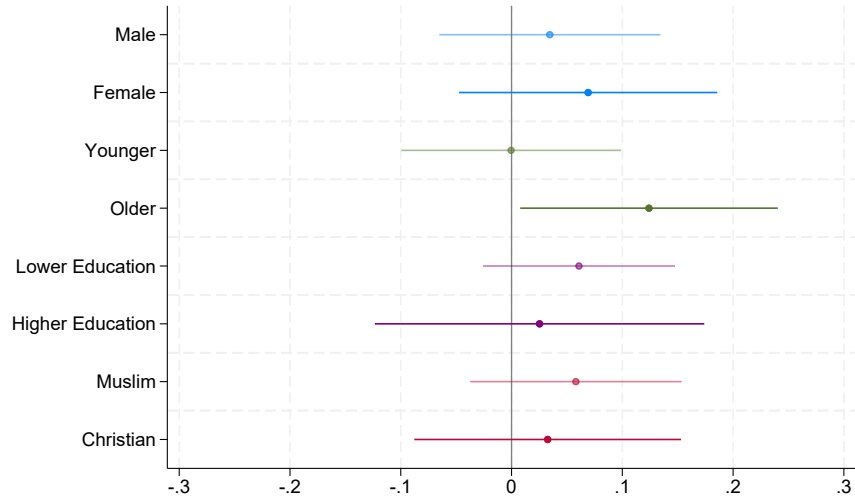
	(1)	(2)
Information	0.068 [0.193]	
Religious Sender		0.094* [0.095]
Tax Official Sender		0.040 [0.531]
Constant	0.918*** [0.000]	0.922*** [0.000]
Controls	✓	✓
Session FE	✓	✓
$\rho^T = \rho^R$		0.355
Observations	366	366
$R^2$	0.117	0.119

*Notes:* The table reports OLS regressions of Tax Benefits Beliefs (takes values of one if the respondent states that health infrastructure and services are financed (at least partly) by the government and zero otherwise) on the treatment variables (see Table 2 for definitions) as well as session fixed effects and the background variables “More educated”, “Female”, “Older” and “Christian” (see Table 1 for definitions). P-values in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Figure 5: Heterogeneous Response to Treatment



(a) Religious Sender



(b) Tax Official Sender

*Note:* The figure displays 90% confidence intervals of regression coefficients estimated from Equation 4, using separate regressions for each indicator (male, female, younger, older, lower and higher education as well as Christian and Muslim). Coefficient estimates are reported in Table A.3 in the Appendix.

Based on these findings we formulate the following results:

**Results 3:** The information from the religious leader is most effective when participants perceive it as novel, indicating that the intervention works primarily by introducing new knowledge rather than reinforcing existing beliefs.

**Result 4:** The religious sender's influence on voluntary tax compliance is particularly pronounced among participants with lower education levels and among Muslim respondents.

## 6 Conclusion

This study examines whether providing information about the benefits of taxation increases voluntary tax compliance and whether the effectiveness of such messaging depends on the sender. Our lab-in-the-field experiment in Dar es Salaam, Tanzania, provides compelling evidence that information about tax-benefit linkages significantly increases compliance and that the effect is primarily driven by religious leaders rather than government tax officials. Participants who received tax-benefit information from a religious leader exhibit significantly higher compliance rates. This effect is particularly strong among less-educated individuals and Muslim respondents. We find larger effects among participants who perceived the information novel.

These findings have important implications for tax policy and state-building efforts in contexts where trust in formal institutions is limited. Governments in low- and lower-middle-income countries (LLMICs) often struggle with tax enforcement, and traditional state-led messaging may not always be the most effective in fostering voluntary tax compliance. Our results suggest that leveraging trusted non-state actors – such as religious leaders – could be a promising strategy for encouraging compliance, particularly in societies where religious institutions play a central role in public life.

While our study provides valuable insights, it also raises important questions for future research. First, testing these findings in a field setting would help assess whether the effects observed in the lab translate to real-world tax behavior. Further research is also needed to explore the mechanisms through which religious leaders influence tax compliance and whether their effectiveness is unique to religious authority or extends to other trusted community figures. Additionally, future studies should investigate why Muslim participants are more responsive to

religious senders and whether individuals react differently when the religious leader belongs to a faith other than their own.

Overall, our findings highlight the potential of engaging non-state actors in tax compliance efforts and underscore the need to consider local social structures when designing tax policy interventions.

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# Appendix

## A Additional Results

Table A.1: Effect of tax benefits information and sender on tax compliance, indicator variables

	Indicator Full Compliance				Indicator High Compliance			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Information	0.058 [0.157]	0.064 [0.124]			0.094* [0.051]	0.094* [0.053]		
Religious S.			0.047 [0.332]	0.052 [0.289]			0.120** [0.035]	0.116** [0.043]
Tax Official S.			0.071 [0.167]	0.077 [0.135]			0.064 [0.262]	0.070 [0.229]
Controls		✓		✓		✓		✓
Constant	✓	✓	✓	✓	✓	✓	✓	✓
Session FE	✓	✓	✓	✓	✓	✓	✓	✓
$\rho^{TS} = \rho^{RS}$			0.681	0.659			0.362	0.459
Observations	397	389	397	389	397	389	397	389
$R^2$	0.092	0.109	0.093	0.110	0.103	0.116	0.105	0.118

*Notes:* The table reports OLS regressions of an indicator for compliance in the Tax Evasion Game (*Full Compliance*: takes the value of one if the individual reported the full amount of received income and zero otherwise; *High Compliance*: takes the value of one if the individual reported an above median amount of received income) on the treatment variable “Information” (see Table 2 for definition) as well as session fixed effects and the background variables “More educated”, “Female”, “Older” and “Christian” (see Table 1 for definitions). P-values in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.2: Heterogeneity in response to information

	Var							
	Male	Female	Younger	Older	L.Educ.	H.Educ.	Muslim	Christian
Information	0.063	0.072	0.040	0.109**	0.090**	0.019	0.093*	0.030
	[0.217]	[0.206]	[0.442]	[0.045]	[0.047]	[0.780]	[0.051]	[0.622]
Information X Var	0.009	-0.009	0.069	-0.069	-0.071	0.071	-0.062	0.062
	[0.909]	[0.909]	[0.356]	[0.356]	[0.396]	[0.396]	[0.420]	[0.420]
Controls & Session FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	389	389	389	389	389	389	389	389
$R^2$	0.129	0.129	0.131	0.131	0.131	0.131	0.130	0.130

Notes: The table reports OLS regressions based on Equation (3). Column headers show the indicator variable used to define “Var” (the definitions are provided in 2). P-values are in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A.3: Heterogeneity in response to information, by sender

	Var							
	Male	Female	Younger	Older	L.Educ.	H.Educ.	Muslim	Christian
Religious Sender	0.093 [0.130]	0.074 [0.245]	0.080 [0.198]	0.096 [0.121]	0.118** [0.029]	0.016 [0.835]	0.121** [0.029]	0.026 [0.721]
Religious Sender X Var	-0.019 [0.829]	0.019 [0.829]	0.015 [0.862]	-0.015 [0.862]	-0.102 [0.283]	0.102 [0.283]	-0.095 [0.296]	0.095 [0.296]
TRA Sender	0.035 [0.569]	0.069 [0.328]	-0.000 [0.995]	0.124* [0.079]	0.061 [0.248]	0.025 [0.779]	0.058 [0.316]	0.033 [0.655]
TRA Sender X Var	0.035 [0.710]	-0.035 [0.710]	0.124 [0.180]	-0.124 [0.180]	-0.036 [0.733]	0.036 [0.733]	-0.025 [0.783]	0.025 [0.783]
Controls & Session FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	389	389	389	389	389	389	389	389
$R^2$	0.131	0.131	0.135	0.135	0.133	0.133	0.133	0.133

Notes: The table reports OLS regressions based on Equation (4). Column headers show the indicator variable used to define “Var” (the definitions are provided in Table 2). P-values are in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A.4: Effect of tax benefits information on tax compliance

	(1)	(2)	(3)	(4)	(5)	(6)
Information	0.063*	0.065*	0.067*			
	[0.092]	[0.082]	[0.077]			
Religious Sender				0.082*	0.081*	0.084*
				[0.060]	[0.064]	[0.059]
Tax Official Sender				0.041	0.047	0.048
				[0.359]	[0.301]	[0.293]
Female		-0.005	-0.014		-0.005	-0.016
		[0.905]	[0.720]		[0.890]	[0.695]
Older		-0.047	-0.045		-0.049	-0.047
		[0.248]	[0.278]		[0.228]	[0.256]
More educated		0.049	0.046		0.046	0.043
		[0.250]	[0.277]		[0.279]	[0.314]
Christian			0.038			0.041
			[0.344]			[0.306]
Constant	0.240**	0.273**	0.256**	0.241*	0.276**	0.258**
	[0.047]	[0.034]	[0.043]	[0.051]	[0.035]	[0.045]
Session FE	✓	✓	✓	✓	✓	✓
$\rho^{RS} = \rho^{TS}$				0.397	0.486	0.469
Observations	397	391	389	397	391	389
$R^2$	0.119	0.127	0.129	0.120	0.128	0.130

Notes: The table reports OLS regressions of compliance in the Tax Evasion Game (takes values 0.0, 0.1, 0.2, ..., 1) on the treatment variable “Information” (takes the value of one for individuals who receive information about tax benefits and zero otherwise) in Column (1) and (2), and on the treatment variables “Religious Sender” and “Tax Official Sender” in Columns (3) and (4), as well as session fixed effects and the background variables “More educated”, “Female”, “Older” and “Christian” (see Table 1 for definitions). P-values in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.5: Effect of sender on perceived credibility and trustworthiness of information

	Credibility	Trustworthiness
Religious Sender	-0.069	0.023
	[0.145]	[0.743]
Constant	0.954***	0.562**
	[0.000]	[0.011]
Controls	✓	✓
Session FE	✓	✓
Observations	248	248
$R^2$	0.171	0.153

Notes: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## B Deviations from the pre-analysis plan

This section reports deviations from the Pre-Analysis plan.

### B.1 Additional Information Treatment

In line with the pre-analysis plan, we recruited 795 participants for our experiments. Half of the respondents (398) received an additional information treatment designed for a separate study at the beginning of the experiment.<sup>20</sup> It turned out that participants receiving this additional information treatment i) behave differently in the Tax Evasion Game and ii) respond differently to our information treatments. Since the experiment was not designed to study such effects, we only report results for the group that was not affected by the additional information treatment in this paper.

### B.2 Empirical Specification for Effect of Sender of Information

Because of small sample size, we use an alternative specification to test for the differences between both senders. Results for the pre-specified equation in Equation (5), where the reference category for Religious Sender<sub>*i*</sub> are participants in the Tax Official Sender only, are reported in Table O.A.1 in the [Online Appendix](#).

$$y_i = \alpha + \beta_1 \text{Religious Sender}_i + \gamma \mathbf{X}_i + \varepsilon_i \quad (5)$$

### B.3 Outcome Variable

In this paper, we focus on formal tax compliance. We also pre-specified analyses for a measure of compliance with contributions to non-state actors (community health initiative) to see whether this informal tax compliance crowds-out formal tax compliance. We do not find an indication for this and therefore report the results for the pre-specified analysis on informal tax compliance, see Table O.A.2 in the [Online Appendix](#).

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<sup>20</sup>The pre-analysis plan of this study can be accessed at <https://aspredicted.org/ws6hz.pdf>.

#### **B.4 Definition of Education Indicator**

We pre-specified to use a standard definition of *Higher Education* (i.e., indicator taking the value of one if respondent's highest level of education is a completed 4-year college degree or more and zero otherwise). After examining the distribution of educational attainment, we developed a more accurate measure of education: The indicator variable for *More Educated* takes the value of one if the respondent has more education than completed primary school and zero otherwise.

## C Additional Descriptives

Table C.1: Descriptives by Treatment Group

	Control	Info	Tax Sender	Religious Sender
Christian	0.43 (0.04)	0.40 (0.03)	0.45 (0.05)	0.36 (0.04)
More educ	0.32 (0.04)	0.33 (0.03)	0.29 (0.04)	0.37 (0.04)
Female	0.43 (0.04)	0.45 (0.03)	0.41 (0.04)	0.48 (0.04)
Older	0.37 (0.04)	0.45 (0.03)	0.43 (0.04)	0.47 (0.04)
Observations	142	255	122	133

*Notes:* The table reports means and standard errors (in parentheses) for background characteristics by experimental treatment. See Table 1 for definitions of variables.

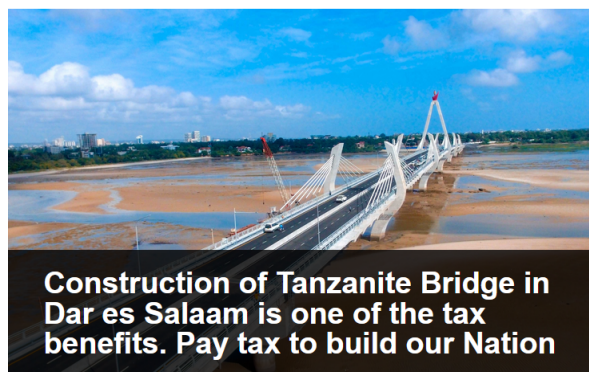
## D Additional Information

Table D.1: Market list

Date	Sessions	Market	# of			
			Recruited	Participants	Traders	Refusal
13.02.2023	1,2	Mtambani	50	23	420	2
13.02.2023	3,4	Mkunguni	50	18	114	3
14.02.2023	5,6	Tegeta	50	24	1300	5
14.02.2023	7,8	Bunju	50	26	238	1
15.02.2023	9,10	Africa Sana	50	30	178	0
15.02.2023	11,12	Mwenge	50	30	125	0
16.02.2023	13,14	Mwananyamala	50	23	1150	1
16.02.2023	15,16	Kisiwani	50	27	70	0
17.02.2023	17,18	Tandale	50	23	560	1
17.02.2023	19,20	Makumbusho	50	22	618	0
20.02.2023	21,22	Manzese	50	28	445	0
20.02.2023	23,24	Mabibo	50	24	13230	2
21.02.2023	25,26	Urafiki	50	21	250	0
21.02.2023	27,28	Shekilango	50	24	622	0
22.02.2023	29,30	Magomeni	50	25	946	0
22.02.2023	31,32	Babati	50	29	72	0

*Notes:* Participants from each market were divided into two equal groups, ensuring that both groups do not interact with each other until all participants completed the experiment. Out of 800 participants that showed up to the experiment, the answers of five participants had to be excluded from the analysis.

Figure D.1: Illustration by Tanzanian Revenue Authority



*Note: This is an example of an tax benefits information illustration provided by the Tanzanian Revenue Authority on their homepage.*