Does Progressivity Raise Tax Capacity?

Experimental Evidence from the D.R. Congo

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Abstract

Progressive taxation is a defining feature of high-income countries' tax systems, but developing countries typically rely on less progressive instruments. We study the introduction of progressive property taxation in a large Congolese city through a citywide field experiment conducted in partnership with the provincial government. Neighborhoods were randomly assigned to either a progressive or a proportional schedule with equal revenue potential. The progressive system increased total revenue by 55% relative to the proportional one. Revenue gains occurred across the property value distribution: at the top, higher statutory rates mechanically outweighed modest compliance losses, while at the bottom, lower rates induced large compliance gains that more than offset the mechanical revenue loss. Cross-randomized information treatments show that taxpayers' responses were driven by their own rates rather than by others' rates or by the perceived fairness of the overall system. Finally, we examine how statutory progressivity maps into *effective* tax rates (ETRs). Across all systems, ETRs decline with property value — implying that the rich pay less as a share of wealth — and this gradient is steepest under the progressive schedule. However, enforcement interventions focused on higher-value properties reverse this relationship, suggesting that investments in targeted enforcement can help align effective with statutory progressivity.

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1 Introduction

Progressive income taxes emerged in the early 20th century alongside major revenue gains in Europe and the United States and remain central to advanced-economy tax systems (Besley and Persson, 2009; Scheve and Stasavage, 2010). Across countries today, there is also a strong positive relationship between tax progressivity and the amount of revenue raised by the income tax as a share of GDP (Figure A1). Yet whether this relationship is causal remains unclear: does progressivity increase tax capacity, and through what mechanisms?

This question is particularly important in developing countries, where governments face acute revenue gaps and significant barriers to implementing progressive taxation. These barriers include the economic structure of low-income countries – largely informal economies with low financial development – that hinders measurement of the tax base and enforcement of income taxes (Gordon and Li, 2009; Jensen, 2022).[1] There are also political economy barriers, stemming from limited political demand for progressive taxation in elite-dominated coalitions (Besley and Persson, 2014). Finally, there is state capacity itself that limits tax administration resources that are needed to implement progressive systems that are more costly to administer than simplified, presumptive tax instruments (Zolt and Bird, 2005; Regan, 2020).[2] Enabling progressive taxation by relaxing these constraints could potentially boost tax capacity while allowing governments to pursue redistributive objectives.

This paper studies the introduction of progressive property taxation in the D.R. Congo (DRC), one of the world's poorest countries, where total tax revenue remains below 10% of GDP. Our study leverages a recent technological leap in the ability of local governments to systematically measure the property tax base, allowing property taxes to be set as a percentage of assessed value instead of flat fees and enabling experimentation with alternative rate structures: Proportional vs. Progressive schedules.[3] In partnership with the tax authority of the Provincial Government of Kasaï Cen-

[1] One offsetting factor is that consumption taxes are sometimes *de facto* progressive in developing countries because of the prevalence of informal consumption among lower income population (Bachas et al., 2024b).

[2] The use of coarse tags to proxy for the tax base in presumptive systems can create inequities among similar taxpayers that hinder the desirability of progressive tax rates (Best et al., 2025).

[3] The mass valuation of all buildings in Kananga uses a rich set of building characteristics measured by drone and household surveys combined with an expert-assessed training sample. As we discuss in Section 3.1, this approach to mass valuation was pioneered in Freetown (Prichard et al., 2020) and has been adopted by many developing countries in recent years (Knebelmann, 2022).

tral, we implemented a citywide field experiment in Kananga (population 1.6 million). During the 2024 property tax campaign, the 460 neighborhoods of the city were randomly assigned to a Progressive property tax rate schedule (41% of neighborhoods), a Proportional rate schedule (41%), or remained in the *Status Quo* (18%).[4]

Although proportional property taxation remains the most common system around the world, a growing number of developing countries are introducing progressive property taxation, which is a more feasible form of redistribution through direct taxation than income taxation, which remains elusive due to information and enforcement constraints.[5] To ensure that we could credibly compare the revenue impacts of Progressive and Proportional systems, our design held constant their revenue potential under full compliance. In other words, the average tax liability was constant across these treatments, but tax rates in Progressive were calibrated to pivot around this common mean, raising liabilities for higher-valued properties and lowering them for lower-valued ones.[6] All other components of tax administration — building valuation method, payment modalities, collector visits and incentives, enforcement efforts — were also held constant across treatments.

Why might a progressive tax schedule raise more revenue than a proportional one with the same average liability? Three countervailing forces are at play. The first is the *mechanical effect* of tax rate changes. At the top of the property value distribution, higher statutory rates increase tax liabilities and would mechanically raise revenue absent any behavioral response (i.e., under full compliance). At the bottom of the distribution, lower rates would mechanically reduce revenue. Second, there are *behavioral responses* to one's own rate. Facing higher rates, owners of high-value properties may reduce their compliance, thereby offsetting part of the mechanical gain at the top. Conversely, lower rates at the bottom may encourage more owners to pay, increasing

[4]Our main focus is to compare a Proportional (fixed rate) vs. Progressive tax schedule. The Status Quo arm allows us to estimate the policy-relevant impact of adopting value-based tax rate systems relative to flat fees, which remain common in similar settings.

[5]One potential concern with achieving progressivity through property taxes is how capitalization into property prices might affect it. In frictionless markets, lower prices can fully offset higher taxes, so progressivity could fade. However, in Kananga the property market is thin, taxes are not salient and face limited enforcement, and there are additional financial and housing supply and demand constraints that can prevent full capitalization. Given null findings of property tax capitalization into real estate markets in more developed countries (Nielsson et al., 2024; Best et al., 2015), capitalization is unlikely to be a first-order concern in our setting.

[6]Tax liabilities were systematically lower in neighborhoods assigned to Status Quo, a legacy of prior years' tax policy. Although not our main comparison of interest, when we examine revenue differences between Status Quo and Progressive or Proportional we adjust for this difference in liabilities, as discussed in Section A4.1.

compliance and revenue. Finally, there may be *second-order behavioral responses* — changes in compliance driven by awareness of others' rates and preferences over the tax rate system. If taxpayers perceive progressivity as fair, for instance, it could strengthen tax morale and raise compliance across the property-value distribution. Which of these three forces — the mechanical effect, own-rate behavioral responses, or second-order behavioral responses — dominates overall, and how their relative importance varies across the property-value distribution, is an empirical question our field experiment is designed to answer.[7]

According to administrative tax data, the Progressive tax schedule increased average revenue by 55% relative to Proportional.[8] This effect is large, precisely estimated, and robust across a range of specifications — including alternative functional forms, sample restrictions, and accounting for potential corruption opportunities from field-based tax collection. We further show that these gains reflect taxpayers' behavior rather than differences in collector effort by (*i*) holding collectors' expected wages constant across treatments and within neighborhoods, and (*ii*) examining revenue effects among taxpayers with randomly assigned tax visit appointments, which preclude selective targeting by collectors. Both approaches reinforce that our main effects come from taxpayer responses to the progressive tax system treatment.

Importantly, the Progressive schedule increased revenue throughout the property value distribution. These increases, however, reflect different mechanisms among high- and lower-value buildings. Among the bottom 90% of properties, the behavioral response to lower rates — higher compliance — more than offsets the mechanical revenue loss. In other words, enough additional payers entered the tax net thanks to lower tax rates to more than compensate for the drop in potential revenue. That lower tax rates in this part of the distribution raised revenue is consistent with past work in this setting that motivated the government to experiment with progressive tax rates in this campaign (Bergeron et al., 2024). At the top 5% of the distribution, by contrast, the

[7]Similarly to recent papers on property taxation in developing countries, we focus on tax compliance as the key margin of behavioral response and we abstract from real responses (Brockmeyer et al., 2023; Best et al., 2025). There is a rich set of variables used in the property value assessment and the valuation estimation process is complex, which reduces concerns over distortions in property characteristics as in the English windows tax (Oates and Schwab, 1997). Also, tax increases are not likely to impact investment in properties because the cadastral value – on which the tax is based – would not be affected by maintenance or upgrades.

[8]The difference relatively to Status Quo is 54%. There is no detectable difference in revenue between Proportional and Status Quo. When we make comparisons with Status Quo, we adjust our estimates following a pre-specified approach to reflect the difference in average tax liability.

mechanical effect of higher statutory rates dominates the potential decline in compliance. In sum, progressivity boosts revenue both by shifting the tax burden toward higher-value property owners and by eliciting greater compliance among lower-value owners.

The revenue-maximizing tax schedule thus appears to increase in property value, much like the progressive system. To formalize this point, we estimate the revenue-maximizing tax schedule directly using random variation in tax rates within bands of property value generated by assignment to Proportional or Progressive. This variation allows us to estimate the elasticity of tax compliance with respect to the tax rate, which we apply in a standard formula for the revenue-maximizing tax rate in each property value band. The revenue-maximizing tax schedule lies between the Proportional and Progressive rate schedule and increases with property value, although the slope is flatter than under the implemented Progressive system. Buoyed by the 2024 results, the government scaled up the progressive system throughout Kananga in 2025.

To assess whether second-order behavioral responses — that is, changes in compliance driven by preferences over the tax rate system — help explain the effect of Progressive on revenue, we conduct several complementary tests. First, we embedded a cross-cutting information experiment on the back of tax bills. Randomized at the property level, treated owners received information about the distribution of tax rates in their neighborhood, while control owners received placebo information. If favorable views of progressive taxation contributed to the revenue gains, we should expect this information treatment to increase compliance in Progressive more than in Proportional. However, providing information about the tax system did not alter compliance in either system — on average or across the property-value distribution.

While this null result could in principle reflect low salience of the information, weak preferences for progressivity, or inframarginality of second-order behavioral responses in the compliance decision, the evidence points mainly to the last explanation. Low salience is plausible in 2024, since collectors often appear not to have explained the tax-system information on the bill.[9] But in 2025 the government introduced much stronger monitoring — including audio recording of bill delivery and wage penalties for collectors who failed to read the bill carefully — to ensure that this information was actually transmitted, yet the treatment still had no effect on compliance. Weak preferences are

[9]In addition to casting doubt on possible second-order behavioral responses, the low salience of the overall tax system also mitigates concerns that awareness of the randomization itself might have affected potential outcomes or compromised external validity.

also unlikely to explain the null: taxpayers expressed support for progressive taxation at baseline, those assigned to their preferred system are somewhat more likely to pay, and, most importantly, in a separate endline survey experiment with high comprehension, respondents updated positively about the fairness of Progressive when its rate structure was made salient. We therefore interpret the null results as evidence that fairness preferences are largely inframarginal in the compliance decision: taxpayers respond primarily to their own tax rates, not to the progressivity of the system as a whole.

We then investigate how introducing a statutorily progressive property tax system affects the distribution of *effective* tax rates (ETRs) — taxes paid as a share of property value. Across all tax systems, ETRs decline with property value: owners of higher-value properties pay larger amounts in absolute terms, but these payments represent a smaller share of their property's value. Moreover, the ETR is higher but declines even more steeply with property value in the progressive tax system. Although high-value properties had similar ETRs in Progressive and Proportional, higher compliance among lower-value properties in Progressive raised the ETR at the bottom. Thus, although high-value properties contributed more revenue in absolute terms under Progressive, the overall distribution of ETRs was paradoxically more regressive than under a proportional statutory system.[10]

Finally, we examine how enforcement interacts with the realized progressivity of the tax system. A uniform enforcement intervention in 2024 — a deterrence message on tax bills coupled with follow-up visits to delinquents — increased compliance overall but had especially large effects among low-value properties, thereby pushing up ETRs at the bottom and making the distribution even more regressive. By contrast, three *targeted* enforcement policies in 2025 — reducing collection effort for low-value properties, applying genuine enforcement to the city's highest-value properties, and sending SMS messages highlighting recent commercial closures for nonpayment — shifted compliance and revenue at the top of the value distribution. Together, these targeted policies generated an upward-sloping ETR schedule in 2025. The scaled-up progressive tax system thus generated more revenue and was substantially more de facto progressive than 2024 Progressive neighborhoods.

This paper provides the first credible evidence on the causal effect of introducing a progressive tax system on total revenue. The closest paper is Ajzenman et al. (2024), who study a series of reforms in Argentina that gradually made the property

[10] As we discuss in Section 7, the regressive ETR does not imply that the welfare impact of the Progressive system benefits those at the bottom of the distribution less than those at the top.

tax schedule more progressive. Their analysis exploits a regression discontinuity design to estimate the *local* compliance responses of properties near rate thresholds and a tax-letter experiment that makes the increase in progressivity salient. By contrast, we study the *aggregate* revenue effects of introducing a progressive property tax schedule relative to a proportional tax schedule — the most common policy alternative. The provincial government's decision to roll out these tax systems using a randomized field experiment allows us to estimate treatment effects on revenue both on average and across the property-value distribution. While our results point to the promise of progressive property taxation, most developing countries have proportional schedules. Given the generality of our mechanism results,[11] we suspect other low-income governments could similarly increase revenue from progressive property tax reforms — while also improving the perceived fairness of the tax system.[12]

Second, our work is part of growing interest in tax incidence and equity in the literature on public finance in developing countries (Bachas et al., 2024a,b; Best et al., 2025; Fisher-Post and Gethin, 2025; Palomo et al., 2025). For instance, Bachas et al. (2024b) shows that, contrary to conventional wisdom, consumption taxes tend to be progressive in many developing countries because informal (and thus untaxed) consumption constitutes a much larger share of spending among low-income households than among richer ones. Best et al. (2025) documents horizontal inequities created by presumptive property taxation in Brazil, where arbitrary administrative boundaries generate discontinuous tax liabilities across otherwise similar properties. We build on this literature by shifting the focus from horizontal to vertical equity, studying how statutory progressivity in tax rates affects tax revenue and the distribution of tax burdens. We further contribute to research on the progressivity of developing-country tax systems (Fisher-Post and Gethin, 2025; Palomo et al., 2025) by documenting a gap between statutory and effective tax rates across the property value distribution — and, crucially, by showing that targeted enforcement can reduce this gap. Even in a low-capacity setting like the DRC, enforcement investments raise ETRs at the top of the distribution, bringing effective progressivity closer to statutory intent.[13]

[11] Revenue gains from progressivity in our setting arise largely from taxpayer responses to their own rates, emphasizing the role played by liquidity constraints, which are a well-documented barrier to property tax compliance in other developing contexts (Brockmeyer et al., 2023).

[12] According to recent survey experiments, citizens appear to view tax progressivity favorably in most developing countries (Hoy, 2025) — as we found in Kananga.

[13] While past work has compared the effectiveness of tax administration reforms and tax rate changes (Basri et al., 2021) or tax enforcement and tax rate changes (Brockmeyer et al., 2023), there is less evidence on how tax policy and enforcement *interact*. An exception is Bergeron et al. (2024), who

Third, we provide some of the first evidence concerning how taxpayers in low-income countries perceive the fairness of different types of tax rate systems. Our evidence aligns with Hoy (2025), who finds that citizens in many developing countries self-report stronger tax morale in survey experiments when they learn that their tax system is progressive. It also aligns with Ajzenman et al. (2024), which finds that an informational flier making salient the increase in progressivity of the property tax leads people to view the system as more fair across the distribution of property values.[14] We contribute by studying fairness with four sources of experimental variation: the field experiment of different tax systems (Progressive only increases the perceived fairness of one's own tax rate), the 2024 tax bill experiment (no effects), the 2025 endline survey experiment (salience of progressivity increases the perceived fairness of the system across the distribution), and the 2025 tax bill experiment (results forthcoming). Overall, the evidence suggests that people express preferences for progressivity but often respond more to their own rates when making compliance decisions.

2 Setting

The study takes place in the city of Kananga, in the Kasaï Central Province of the Democratic Republic of Congo (DRC). Kananga is home to roughly 1.6 million residents — making it the Congo's fourth largest city — and serves as the seat of the Provincial Government of Kasaï Central. The DRC is among the world's poorest countries: in Kananga, the median reported income is $53 per month (compared to $40 nationally).

Like many local governments in low-income countries, the Provincial Government of Kasaï Central relies primarily on transfers from the national government for the bulk of its revenue. These transfers, however, are frequently delayed — most years, several *never* arrive — and seldom meet the province's needs or development goals. The government therefore faces strong pressure to mobilize more reliable own-source of revenue. As elsewhere in similar contexts, the most promising option is the property tax (Moore et al., 2018). Property is a visible and immovable asset; taxing it is thus

study how the revenue-maximizing tax rate depends on enforcement. Here, by contrast, we examine how enforcement interacts with different tax systems and shapes the distribution of effective tax rates.

[14] To be more precise, their treatment provides information about progressivity alongside the statement (in treatment and control) that the property tax is "now fairer and more equitable," while our mailings provide the tax system information without mention of fairness or equity.

relatively efficient and potentially easier for low-capacity tax authorities than taxes with more manipulable and hard-to-verify tax bases. Moreover, Africa's rapid urbanization is driving up property values, creating a potential revenue base to fund urgently needed urban infrastructure (Fjeldstad et al., 2017). Yet property taxation remains the most underutilized tax instrument in low-income countries relative to its role in richer ones (Brockmeyer et al., 2023), implying substantial scope for revenue growth.

In Kasaï Central, the property tax currently accounts for 29% of total provincial tax revenue — the largest single source.[15] Since 2016, the tax authority has conducted a series of city-wide door-to-door collection campaigns. Despite these efforts, compliance has remained below 10 percent, even though most properties receive both a bill and a collector visit (Weigel, 2020; Balan et al., 2022; Bergeron et al., 2024).

3 Design

The status quo tax system prior to 2024 exemplified the simplified, presumptive tax systems that low-capacity governments often adopt when they lack reliable proxies for the underlying tax base (Franzsen and McCluskey, 2017; Prichard, 2025). Kananga's housing market is thin and largely informal, and valuing properties is costly work that only a few trained experts in the city can perform. As a result, the tax authority incurred this cost for only a few hundred properties in the city center.[16] For the remaining >99 percent of the city, the government relied on a simple two-tiered fee schedule. Properties built with non-durable materials such as adobe bricks, were classified as low value and faced an annual liability of 3,000 Congolese Francs (CF) — roughly $2 — representing about 90 percent of all properties. Those made with durable materials such as cement were classified as high value and faced an annual liability of 13,200 CF — roughly $9 — covering 9 percent of properties (Bergeron et al., 2024).

These fixed fees, applied over coarse bins of property value, implied a tax *rate* that decreased over most of the property value distribution, before rising again for the top 1% (Figure A2). As a result, for the vast majority of taxpayers, the status quo property-tax system was regressive. Indeed, the implied tax rate for the lowest-value property was higher than the highest-value property. Such de facto regressivity is a common feature of presumptive tax instruments. They not only generate horizontal

[15] Other significant revenue sources include business licenses, mining taxes, and transportation taxes.

[16] Even among those, few were formally assessed in recent years. Rather the government applied a uniform flat fee of $200 to any large property designated a 'villa' or 'apartment.'

inequities at the boundaries of classification categories (Best et al., 2025), but also vertical inequities within those categories (Zolt and Bird, 2005; Regan, 2020). To address these inequities and strengthen revenue collection, the provincial government sought to reform its property tax system. The first step was to relax the core constraint that had necessitated the presumptive approach in the first place: the absence of systematic information on building values in Kananga.

3.1 Mass Assessment of Building Values

Inspired by a recent reform in Freetown, Sierra Leone implemented by the Local Government Revenue Initiative (LoGRI) (Grieco et al., 2019), we partnered with the government to mass-assess the value of all buildings in Kananga and roll out a new property tax management software.

First, we collected high-resolution drone imagery of the entire city in partnership with a Kinshasa-based company specializing in aerial mapping. We used these images to identify and label every building using unique Google Plus Codes, and estimate each building's surface area. To estimate areas, we first applied an AI algorithm to detect and trace rooftops, and teams of agents from the tax ministry subsequently reviewed the algorithm's output to correct instances where buildings had been inadvertently merged or divided.

Second, a team of government enumerators conducted 135,915 building surveys, recording 45 external characteristics for each building — including number of levels, quality of the walls, roof, door, window, fence, etc — using a tablet-based questionnaire linkable to each building via its Plus Codes. See Prichard et al. (2025) for more detailed information about this process.

Third, we constructed a ground-truth training dataset by commissioning the government's two senior property assessors to perform detailed market value assessment for 1,500 randomly sampled buildings across the city. We then used LASSO to calibrate a linear model predicting log property value, minimizing out-of-sample root mean squared error (RMSE). The best-performing prediction model included surface area, location, and 15 property characteristics, achieving an OOS RMSE of 0.65 log pts and an OOS R-squared of 0.77 (Figure A3).[17] The government opted for the simpler

[17]Errors are not uniformly distributed by value. Large errors are somewhat more common at in the lower and middle parts of the distribution, where many houses have very similar characteristics. These assessment errors will balance out across treatment groups thanks to the RCT.

linear model — rather than more complex machine-learning algorithms — because of its transparency and interpretability. We then predict values of every building in Kananga.

Of course, these values will not perfectly align with market prices. This is true for essentially all property tax systems, which apply tax rates to *assessed values* from similar mass appraisal models, simplified formulas, or standardized valuation tables. We confirm that our estimated values are strongly correlated with independent survey measures of wealth, income, and expenditure (Figure A4). This exact "points-based" valuation approach has been rolled out by LoGRI in at least six African countries, from Senegal to Malawi (Fish et al., 2017).

These assessed values form the tax base for the new property tax management software (*Moptax*), which was introduced concurrently. The software offers several advantages. First, it automatically calculates each property's assessed value by applying the estimated coefficients to the recorded building characteristics. This makes it easy for tax ministry staff to explain the valuation to taxpayers. Moreover, if a taxpayer appeals the valuation, tax staff can change characteristics easily and re-compute the tax liability; all changes (and users who made them) are logged automatically. Second, it enables year-to-year tracking of payments and arrears using Google Plus Codes — which had not been possible in the past (in the absence of formal street addresses).

3.2 Tax Rate System Experiment

Once the government had established a uniform database of assessed building values, it faced the question of how to set tax rates. Proportional property tax systems — with a single flat rate — are the most common in Africa and globally (Figure A5). Yet an increasing number of countries and municipalities are experimenting with progressive property taxation.[18]

Interest in a progressive schedule in Kananga was partly motivated by a prior collaboration with the tax authority examining the revenue-maximizing tax rate using randomly assigned property-tax liability abatements (Bergeron et al., 2024). That experiment showed that the elasticity of compliance with respect to tax liability de-

[18]Countries with nationally progressive property tax systems include Chile, Greece, Ireland, Morocco, Panama, Indonesia, Poland, Singapore, and Turkey. Progressive property taxes have also been implemented at the municipal level in Argentina, Brazil, China, Colombia, and Mexico. Moreover, most of the world's property tax systems exhibit at least some progressivity, such as exemptions or lower rates for properties at the bottom of the distribution.

clines with property value, implying that the revenue-maximizing rate rises with property value. These findings provided an efficiency-based rationale for progressive taxation—independent of equity or redistributive considerations. In parallel, baseline survey data revealed strong popular support for progressivity: a large majority of Kananga residents preferred a progressive schedule to a proportional one (Figure A7, Panel A). While views were more divided on which system was fairest, both progressive and proportional schedules were perceived as substantially fairer than the status-quo flat-fee system (Figure A7, Panel B).

Building on this evidence, the government implemented a citywide randomized comparison of progressive and proportional property-tax systems during the 2024 tax campaign. In 189 randomly selected neighborhoods, buildings were subject to a proportional rate of 0.4 percent of assessed value. In another 189 neighborhoods, a progressive schedule applied, with rates increasing across five value bands (Table A1): 0.06 percent in band 1 (percentile 0-60),[19] 0.16 percent in band 2 (percentile 60-80), 0.26 percent in band 3 (percentile 80-90), 0.36 in band 5 (percentile 90-95), and 0.56 percent in band 5 (percentile 95-100).[20] A smaller set of 82 neighborhoods remained under the status quo fixed-fee system (explained on p. 9). Although the government did not intend to retain this system, it deemed it useful to preserve it in a small sample of neighborhoods as a benchmark. Overall, 41 percent of total neighborhoods (roughly 43,000 assessable buildings) were assigned to Progressive, 41 percent to Proportional, and 18 percent (roughly 20,000 assessable buildings) to the Status Quo. Figure 1 summarizes the three tax systems of the field experiment.[21]

Crucially, the Progressive and Proportional rate schedules were calibrated to yield identical average tax liabilities across neighborhoods (Figure A6). The Progressive schedule simply tilts rates around this common mean: lower-value properties face lower rates and higher-value properties face higher rates, but the average liability is unchanged. This design implies that the two treatments have the same total revenue

[19]There is one small exception: the government imposed a minimum tax of 2,000 CF or $0.70 to cover administrative recovery costs. This causes the tax rate to decrease slightly with building value at the very bottom of the distribution (Figure 1).

[20]Notches are not uncommon in developing countries (e.g., Kleven and Waseem, 2013; Bachas and Soto, 2019), and they may be more common worldwide for property taxes given that owners often cannot as easily adjust the tax base (especially if it is assessed only periodically with opaque criteria). Countries with notched progressive property tax systems include Ireland, the UK, Indonesia, and Colombia (in Bogota).

[21]Commercial buildings, which constitute 1.8% of total buildings, were subject to slightly higher tax rates: 0.66% in Proportional, and 0.3%, 0.4%, 0.5%, 0.6%, 0.8% for Bands 1-5, respectively.

potential under full compliance. Any observed revenue difference between them is thus attributable to the distribution of rates, not average level differences in rates. This revenue equivalence does not hold relative to the Status Quo, where average liabilities were systematically lower.[22] While our main comparison is between the Progressive and Proportional systems, we also benchmark results against the Status Quo. In those comparisons, we adjust for liability differences using a pre-specified procedure: (i) estimate the elasticity of compliance and revenue with respect to tax liability from random variation in rates across treatments within value bands; (ii) predict counterfactual compliance and revenue in Status Quo as if average tax liabilities had been equal to those in Proportional Progressive.[23]

In addition to equalizing revenue potential across the Progressive and Proportional treatments, the experimental design holds constant all other aspects of tax administration, as detailed in the next subsection.

3.3 Tax Bill Experiment and Endline Survey Experiment

To shed light on mechanisms — specifically whether taxpayers respond primarily to their *own* rate or also to *others'* rates in the distribution — we embedded a cross-randomized information experiment on the back of property tax bills. Randomized at the property level,[24] each owner received one of three versions: (*i*) a control version providing additional details about the property tax itself, (*ii*) the same information plus their building's position in the citywide distribution of building values, and (*iii*) both of the above, as well as information on the distribution of tax rates and average liabilities under the neighborhood's assigned tax schedule.[25] Treatment (*iii*) provides the key mechanism test. Because the content of the message varied with the neighborhood's assigned tax system, taxpayers in Progressive neighborhoods learned that tax rates increased with building value, while in Proportional neighborhoods they learned that all buildings faced a single rate. Figure A10 shows a complete tax bill flier, and Figure A11 shows the key visuals for treatments (*ii*) and (*iii*) in Proportional and Progressive neighborhoods.

[22] The tax rates the government chose in Proportional and Progressive constituted an increase relative to the status quo, hence the average difference in liabilities with the previous fixed fees.

[23] See Section A4.1 for details.

[24] The unit of randomization is the property, not the building, to ensure that owners of plots with multiple buildings receive a single treatment.

[25] A fourth treatment provided details on the assessment methodology and the specific recorded characteristics of the building. This transparency intervention is analyzed in a companion paper.

The logic of the design follows directly from the underlying behavioral mechanisms underlying compliance responses. Taxpayers in the control group received only information about their own tax liability; comparisons of tax compliance between Progressive and Proportional within this group thus isolate the effect of one's own liability.[26] If, instead, knowledge of the broader tax system — and the fairness considerations it may trigger — matters for compliance, then compliance gaps between Progressive and Proportional neighborhoods should widen among properties assigned to treatment (*iii*).

To further investigate these mechanisms, we implemented a follow-up information experiment in the 2025 endline survey. The design closely mirrors the tax bill experiment. Control respondents received no information while the main treatment group was shown the same tax rate distribution visual used on the tax bill, showing the distribution of rates in their neighborhood during the 2024 tax campaign. A secondary treatment provided both the tax-system information and data on average 2024 compliance rates within each value band, allowing us to test whether knowledge of *others'* compliance affects perception or intended behavior. The intuition is that, as information diffuses and taxpayers observe or infer whether others are paying, the compliance distribution may become salient and shape their preferences and perceptions of the tax system. Finally, in a cross-randomized arm, half of respondents learned their building's location in the value distribution, mirroring treatment (*ii*) in the tax bill experiment. The hypotheses underlying this survey experiment are identical to those in the flier experiment, but its advantage is greater control over salience and comprehension: enumerators provided the information, explained it in detail, provided multiple examples, and verified understanding using comprehension checks.

Finally, in the 2025 campaign, in which the Progressive system was scaled up throughout Kananga, we repeated the tax bill experiment but with two enhancements. First, we simplified the graphs used to convey the distribution of tax rates (Figure A12) and retrained tax collectors on the delivery. Second, collectors' tablets also automatically made audio recordings of their explanations of the tax system information, which we used to check their compliance with the protocols and the quality of their delivery.

[26] This interpretation assumes that taxpayers did not learn about variation in tax systems through word of mouth, an assumption we test in Section 5.6.

3.4 Property Tax Administration

Tax Campaign Mechanics. Across all treatments, the tax campaign operated identically, in several steps. First, tax collectors went door-to-door delivering bills. There was one bill for each assessable building with a unique Plus Code and tax ID. Properties with multiple buildings inside the plot received multiple bills. The bill showed the property owner's name, a picture of the building, a picture of a valid receipt, the total liability, and details about how to pay, payment deadlines, and where to find more information (Figure A9). Importantly, the bill did not make salient the property tax system of the neighborhood. It also did not show the assessed value of the building. Both of these aspects were revealed to randomly assigned subsets of taxpayers to unpack different mechanisms, as we describe in Section 3.3. During the bill delivery visit, collectors also elicited preferences over revisit dates for a random subsample of properties.

Second, tax collectors returned to each property during the payment facilitation stage of the campaign, a few weeks following bill delivery. They directly solicited payment of the property tax during this visit. Collectors received a daily schedule of visits to make, which contained a mix of visits scheduled according to taxpayer preferences and randomly assigned visits. We developed a matching algorithm to give taxpayers their highest choices subject to scheduling constraints and the need to spread out random visits over time (see Section A4.2 for details). We introduced this layer of experimental variation to help rule out differential collector targeting of certain property types by tax system treatment — as we discuss in Section 3.5. In addition to these scheduled visits, tax collectors also had time to make additional discretionary visits in the neighborhood. They recorded all of these scheduled and discretionary visits with a GPS point and time stamp that we could verify.

Payment Modalities. Taxpayers could pay in two ways. First, they could pay the field-based collector, either during the bill delivery visit (rare) or during a payment facilitation visit. If they paid in this way, the tax collector would issue them a receipt identical to that shown on the bill. The collector would then log the payment at the tax authority. Receipt books — which had unique increasing identifiers and carbon copy pages — were regularly checked to ensure no payments went missing. Second, taxpayers could pay directly at the tax authority, where they could visit the payment desk and get their receipt. Although this would be more costly, some taxpayers with

larger liabilities appeared to prefer this modality due to lack of trust in the collectors. Regardless of the payment modality, all payments were individually reconciled in the digital tax database.

In the past, taxpayers have only been able to pay their full tax liability: partial payments were not permitted. In the 2025 campaign, a subsample of taxpayers was randomly selected to be invited to pay in installments of at least one-third of the liability. This property-level variation is orthogonal to the tax system experiment and the subject of a companion paper (Danner et al., 2025).

The property tax is owed by the property owner. In Kananga, roughly 75% of properties are owner-occupied; the rest are rented. For properties with only renters, the property owner is responsible for making arrangements with the renter to transmit the bill to them for payment.

Exemptions. There are two levels of exemptions. First, some buildings were ex ante deemed non-assessable based on building characteristics collected during the assessment field survey.[27] Second, certain property owners are also legally exempt based on their own characteristics: owners who are older than 55 years or who are widows (and who, in both cases, must be living without another non-exempt adult in the property). Owner-level exemptions were recorded during the property assessment survey. However, to be legally binding, technically owners must come to the tax authority to claim their exemption.[28] Of the roughly 12% of exempt owners recorded by field-based assessors, only 2% claimed official exemption at the tax authority. Because field-based exemptions were pre-treatment while desk-based exemptions were not, we use the field-based definition when restricting our analysis sample to the non-exempt.[29] We also show robustness to including exempt owners in the sample.

Enforcement. A separate team of enforcement agents made additional house visits to delinquent properties toward the end of the campaign. There were too few agents to visit all delinquents, so we randomly selected a subset to receive these visits. They were informed on the back of the bill that, if they remained delinquent after the payment

[27] Non-assessable buildings include religious buildings, public hospitals and schools, cemeteries, buildings under construction, temporary structures (e.g., market stalls), outbuildings (e.g., external kitchens), and any building that lacks a permanent foundation, walls, and roof.

[28] A summary of the claiming of official exemptions by treatment and band is presented in Appendix Figure A8.

[29] Assessability, field exemptions, and desk exemptions are balanced across tax rate system treatments. The exception is that we observe slightly fewer owners in Status Quo claiming exemptions at the tax authority, likely because their tax rates are systematically lower.

window expired, they would receive a visit from the enforcement team. The enforcement team visited the majority of those selected for this intervention and they collected additional payments. However, they ultimately lacked any strong enforcement action, such as the seizure of assets or locking of buildings.[30]

Tax Collector Incentives. Tax collectors were contractors trained to deliver bills and facilitate tax payments. They received a monthly wage with three components: (*i*) during bill delivery, a fixed amount for delivering the day's assignment of bills; (*ii*) during facilitation, a fixed amount for honoring the day's assignment of appointments;[31] and (*iii*) a performance wage increasing in the amount of tax collected. Parts (*i*) and (*ii*) were calibrated to a reasonable daily target; failure to reach that target resulted in a linear penalty. As we discuss in Section 3.5, the performance wage was designed to equalize the expected wage across treatments and within neighborhoods. Although they were not full-time staff, similar contractors have received promotions to permanent positions in the past. They may thus experience career incentives, too.

3.5 Neutralizing Collector Effort

A key threat to our design arises from the possibility that collectors might work harder or differentially target certain types of taxpayers by tax system treatment. For example, if collectors exerted more effort to collect taxes from the owners of high-value buildings in Progressive, it would be difficult to attribute a treatment effect on revenue in the top band to *taxpayer* responses.

We have two solutions to neutralize collector effort. First, we held collectors' expected wages constant (*i*) across treatments and (*ii*) within neighborhoods. The logic of (*i*) is to ensure that collector effort levels remained constant across treatments. The logic of (*ii*) is to ensure that, within the neighborhood they are assigned to on a given day, collectors did not have incentives to systematically target certain types of taxpayers more than others. If collectors received a wage, w_i, equal to a constant share of revenue collected from building i, a policy used in many developing countries (e.g., Khan et al., 2015), they would receive more for collecting from high-value buildings in the Progressive arm. Whether they would actually target these buildings, however,

[30] Weak enforcement of the property tax is common in developing countries (Figure A14). Even in higher-capacity, middle-income countries like Brazil and Mexico, it is common to find extensive-margin tax compliance below 50% with little serious enforcement among the delinquent.

[31] We could verify appointments were honored using the GPS location and timestamp of collector visits.

would be determined by their beliefs about the probability of compliance, p, of high- and low-value building owners. Ultimately, collectors maximize their expected wage $p_i w_i$, which factors in the expected compliance of each property owner. To neutralize incentives to target buildings of different value with greater collection effort, we therefore equated the expected wage of all buildings in each neighborhood and solved for the wage for building j:

$$w_j = w_i \frac{p_i}{p_j} \tag{1}$$

To estimate p, we used the exogenous variation in tax liabilities in Bergeron et al. (2024) to estimate compliance elasticities. We then predicted the compliance probability for every building in Kananga according to its 2024 liability (depending on the tax system of the neighborhood).[32] We then set wages to equate the wage ratio and predicted compliance ratio for any pair of houses i and j within the neighborhood. After setting the ratio of wages within a neighborhood, we then adjusted the average neighborhood level of all wages to ensure that we also achieved (i), namely that the average expected wage was constant across treatment groups. Finally, to simplify presentation, the resulting performance wage for collecting taxes from each building was visible on collectors' assignment sheets next to the owner's name and liability.

The second solution to collector targeting is to re-estimate our main results to payments made during random facilitation visits. Because these visits were randomly assigned, we know that payments made during them were not the product of differential targeting by tax collectors (assuming that collectors honored their appointments).[33]

3.6 2025 Tax Campaign: Scale-Up

In 2025, the government chose to scale up the Progressive tax system throughout Kananga. The 2025 tax campaign was analogous to the 2024 campaign except for several key features. Most importantly, the tax rate system was progressive everywhere. In addition, the government decreased tax rates in all bands but preserved the progres-

[32] Of course, our estimates of $\hat{p}$ will not align perfectly with collectors' subjective expectations. But, given that collectors likely had diffuse priors due to their unfamiliarity with the great majority of neighborhoods they worked in, this wage scheme should offset much of the incentive to differentially target by building value — a hypothesis we will test in the data since we observe visits.

[33] Of course, it remains possible that collectors could exert more effort on the intensive margin, even conditional on untargeted visits — e.g., by staying longer at a property. We can test for intensive margin responses using data on the duration of collector visits.

sive structure of rates. This decrease was motivated by complaints among taxpayers and low observed compliance among high-value owners.[34] Figure A13 compares the progressive rate schedule across years. Finally, the government chose to target collection and enforcement intensity more squarely on higher-value properties by (i) reducing collection effort to zero for almost all of the bottom value band; (ii) conducting true enforcement (e.g., locking commercial properties) among the most valuable properties in the city; and (iii) sending SMS informing people of enforcement actions recently taken — messages more relevant to owners of commercial property.

4 Data and Balance

4.1 Data

We combine two main sources of data: administrative data and survey data. The administrative data covers all property tax payments made in 2024 as well as assessed values, value bands, and exemptions. We also have access to administrative data created by collector visits during bill delivery and facilitation, in which they logged visit times, locations, and other relevant property characteristics, such as whether the property owner was present.

We have three sources of survey data, all collected by the independent survey nonprofit ODEKA. Before the 2024 campaign, we collected a baseline survey (N= 3,947) that we use to assess balance and characterize taxpayers' preferences over different property tax rate systems. Second, in the months immediately after the tax campaign, we collected a midline survey (N = 28,583). This survey gauged property owners' experiences with the tax campaign, including perceptions of fairness. Finally, we collected an endline survey roughly six months after the conclusion of the tax campaign (N = 5,888), in which we elicited a broader set of taxpayers' attitudes and beliefs about the tax system. Most importantly, we included a survey experiment providing detailed information about the respondent's 2024 tax system to further investigate how the tax rate systems shape perceived fairness when they are highly salient.

[34] It also aligns with past work in Kananga suggesting that tax rates were often above the revenue-maximizing tax rate (**?**).

4.2 Randomization and Balance

We stratify the randomization on geographic location and average assessed building value. Specifically, for each of eight geographic regions in Kananga, we split them into above- and below-median assessed value, and then randomized within these 16 strata. We then followed Banerjee et al. (2017) and ran 100 re-randomizations, selecting the randomization that produced the best balance according to a set of baseline neighborhood and property characteristics. The final randomization achieves the expected high degree of balance (Table A2).[35] We examine a range of property characteristics (assessed value, income, public goods access, etc), property owner characteristics (education, employment, tax morale, tax system preferences), tax campaign features (including cross-randomized treatments), and neighborhood-level variables capturing treatment status in past tax field experiments. Of these 41 variables, one is imbalanced at the 5% level and three are imbalanced at the 10% level, as one would expect under random assignment.[36]

5 Results

5.1 Estimation

To identify the causal effects of our tax system treatments, we estimate the following equation using OLS:

$$Y_{ins} = \beta_0 + \beta_1 \mathbb{1}_{ns}^{Progressive} + \alpha_s + \boldsymbol{X}_{ins}\boldsymbol{\Gamma} + \epsilon_{ins} \tag{2}$$

where i indexes individuals, n neighborhoods, and s randomization strata. The omitted category here is Proportional neighborhoods. The α_s are stratum fixed effects. $\boldsymbol{X}_{ins}$ includes individual-level pre-treatment covariates, which in most specifications is empty. We cluster standard errors at the neighborhood level (460 total). In our

[35] The government deviated from the randomization for 496 taxpayers in the top band. In particular, they reassigned high-value buildings in the status-quo group to the proportional group because they wanted these buildings to have higher tax liabilities. Our main specification is the ITT based on the original random assignment, and we show robustness to instrumenting the de facto assignment with the original assignment as well as other approaches in Table A3. This non-compliance from tax authority leadership reveals their readiness to abandon the status quo system.

[36] Given that field-based exemptions and the delivery of bills exhibit some imbalance, we show robustness to controlling for these variables or studying alternative samples not restricting using these variables in Tables A5 and A4.

main specification, we exclude buildings that collectors never located during bill delivery, which is also balanced by treatment, as well as commercial buildings (1.84% of assessable buildings).[37]

While our main specification focuses on the impact of Progressive relative to Proportional, comparing these treatments to the Status Quo system is also policy relevant in settings with similarly presumptive, fee-based property tax systems. At times, we thus augment Equation 2 by adding a dummy for Proportional neighborhoods with Status Quo the omitted group.

5.2 Main Results

We begin by studying how a progressive tax rate system shaped the revenue collected during the 2024 property tax campaign. Progressive increased the average revenue raised per property by 283 CF compared to Proportional — a 55% increase (Figure 2). This increase occurs throughout the distribution of property value (Figure 3), though the positive coefficients in the top two deciles are not statistically significant (Table 1). If we instead compare with Status Quo, Progressive also increased revenue by 279 CF (or 54%); there is no average difference between Status Quo and Proportional.

Progressive also increased compliance — by 8.9 percentage points on average compared to Proportional (Figure 2). This increase occurs throughout the bottom 90% of the distribution (Figure 4), though it is most pronounced in Band 1. In the top decile, compliance is low and not statistically distinguishable between Progressive and Proportional (Table 2). Comparing to the Status Quo, compliance in Progressive is also higher until the eighth decile of building value. It then drops below compliance in Status Quo in the top deciles. Compliance in Proportional is lower than Status Quo in all of the distribution except the bottom decile.

We consider a number of robustness checks (Tables A4 and A5), including (*i*) dropping exempted properties from the analysis sample, (*ii*) including properties that did not receive a bill into the analysis sample, (*iii*) including commercial buildings, (*iv*) controlling for imbalanced covariates, (*v*) estimating results at the compound level (rather than the building level), (*vi*) removing owners of multiple plots (who might receive more than one treatment), (*vii*) removing payments collected by the enforcement team, (*viii*) studying log revenue as the outcome, and (*ix*) flexibly controlling for other cross-randomized treatments, as suggested by Muralidharan et al. (2025). Across each

[37] We show robustness to these sample restrictions in Appendix Tables A4 and A5.

of these approaches, the compliance and revenue impacts of Progressive remain large and significant.

5.3 Mechanical v. Behavioral Effects of Tax Rate Changes

In comparing a progressive system rotated around an average flat rate, the mechanical and behavioral effects of the corresponding tax rate changes on revenue differ across the value distribution. Under a progressive system, there are higher tax rates on high-value properties (mechanically increasing revenue) and lower tax rates on low-value properties (mechanically decreasing revenue). However, the behavioral effects on compliance go in the opposite direction. At the bottom of the distribution, lower rates may increase compliance (higher revenue); at the top, higher rates may decrease compliance (lower revenue).[38]

These revenue increases in Progressive do indeed reflect different mechanisms at the top and bottom (Figure 5). In the bottom 90%, the behavioral effect on compliance (which raises revenue) outweighed the mechanical effect of lower tax liabilities (which lowers it). In other words, enough additional property owners entered the tax net because of the lower tax rates in Progressive to offset the mechanical reduction in revenue.[39] In the top 5% of the value distribution, however, the mechanical effect of higher tax rates (raising revenue) appears to have outweighed the behavioral effect (lowering compliance and thus revenue), although again the treatment effects here are not statistically significant.

5.4 The Revenue-Maximizing Tax Schedule

A natural question is whether the results in the previous section apply only to the specific progressive system we study, or if it is more generally true that progressivity would increase revenue compared to proportional (holding constant revenue potential)? Put differently, is progressivity truly revenue-maximizing in this context?

To test this conjecture, we follow the approach in Bergeron et al. (2024) and estimate the revenue-maximizing tax schedule directly using random variation in tax rates within bands of property value generated by the experimental assignment to the Proportional

[38]Finally, there are also possibly *second-order behavioral responses*, i.e., compliance effects resulting from awareness of others' rates and the tax system as a whole, as we consider in Section 6.

[39]This finding — that lowering tax rates in the bottom of the distribution increases revenue — aligns with past work in this setting (Bergeron et al., 2024).

and Progressive tax schedule. Specifically, adapting the formula in Bergeron et al. (2024) to a context with tax rates expressed in percentage of property value, the revenue-maximizing tax rate can be written as

$$\frac{\mathbb{P}(\tau^{\mathrm{RM}})}{-\frac{d\,\mathbb{P}(\tau)}{d\tau}\Big|_{\tau=\tau^{\mathrm{RM}}}} \tag{3}$$

where $\mathbb{P}(\tau^{\mathrm{RM}})$ is the share of owners who pay at tax rate τ^{RM} and $-\frac{d\,\mathbb{P}(\tau)}{d\tau}$ is the semi-elasticity of compliance with respect to the tax rate. We can estimate the RMTR by computing $\frac{-\beta_0}{2\cdot\beta_1}$, where β_0 and β_1 are the intercept and slope from a linear regression of compliance on tax rate. We estimate this regression within band, leveraging the variation in tax rates among similar buildings generated by assignment to Progressive or Proportional.

We find that tax rates increase with property value under the revenue-maximizing schedule (Figure 6), although the slope is somewhat flatter than under the implemented progressive system. We can nonetheless confirm statistically that the slope is nonzero and positive. In levels, the estimated schedule lies between the Proportional and Progressive rate structures, and rises from roughly 0.2% at the bottom of the property value distribution to just over 0.5% at the top. Because our design holds average tax liability constant across the Progressive and Proportional schedule, the estimated schedule should be interpreted as the revenue-maximizing schedule around this fixed average liability. In principle, behavioral responses could have produced a much steeper or flatter profile; the fact that the schedule rises moderately with value therefore provides direct evidence that the optimal degree of progressivity is positive but limited — flatter than the implemented progressive schedule yet steeper than a uniform proportional one.

5.5 2025 Campaign Results

In light of the 2024 revenue results, the government scaled up the progressive tax system throughout the city. We therefore have no well-identified way to examine if the 2024 effects persist but can nonetheless study trends for suggestive evidence.

On average, revenue collected in 2025 substantially exceeded that collected in 2024. Comparing 2025 (progressive everywhere) with only the 2024 progressive neighborhoods, average revenue per property increased by nearly 100% (Figure 7, Panel A). Importantly, this increase comes primarily from more payments at the top of the dis-

tribution (Figure 7, Panel B).[40] In fact, average compliance was mostly lower in 2025 (Figure 8, Panel B)— a trend attributable to two factors according to the tax authority. First, due to administrative delays, the collection campaign occurred very late in the year (starting in September), resulting in a compressed timeline that left little time for follow-up collection visits. Second, the sharp appreciation of the Congolese Franc against the dollar disrupted a tax system formally denominated in dollars. Most households held cash at home in Congolese francs, not dollars. Yet taxpayers making cash payments during in-person collection had to use the official exchange rate, which remained fixed at the pre-appreciation level and was therefore highly unfavorable. Taxpayers could instead obtain a more favorable rate by converting Francs into dollars on the parallel market. This sharply reduced payments to in-person collectors. Although some taxpayers substituted toward direct payment at the tax authority—since exchanging currency already required a trip to the city center—the weakening of the facilitation channel ultimately lowered compliance overall.

Despite lower average compliance, the fact that revenue nonetheless increased by nearly 50% is a signal of the important revenue gains at the top of the value distribution (as we return to in Section 8). It also reveals that the 2025 system was more de facto progressive than 2024 Progressive neighborhoods.

5.6 Alternative Explanations

Endogenous Collector Effort. As noted in Section 3.5, an important challenge when studying a tax system with in-person tax collection is whether observed effects reflect taxpayer responses or endogenous tax collector responses. Anticipating this issue, we set collectors' performance wages such that collectors would not have incentives to differentially target properties by value within neighborhoods or across treatments. To assess if this scheme succeeded in neutralizing collector effort, we use administrative data on the GPS location and timestamp of every facilitation visit. There is no difference in the probability of receiving a facilitation visit by treatment, nor are there differences by value band (Table A6). We also check the number of visits and the duration of visits — two intensive margins — and again find no differences. Finally, we control for each of these visit variables. Although they are potentially outcomes of treatment (and thus "bad controls"), controlling for visits would likely change our main

[40] As noted, the government reduced collection effort among the bottom 60% of the distribution. But even in the top 4 deciles of the distribution, more revenue came from the top in 2025.

results if differential collector effort by treatment was a key confounder. However, the results are very similar to those in our main specification (Table A7).

The second approach we pre-registered was to examine tax outcomes from randomly assigned facilitation appointments, which cannot be differentially targeting properties by value or by treatment (so long as collectors honored their appointments). We first verify that, indeed, collectors honored the great majority of their randomly scheduled facilitation visits: 86% on average, compared to 85% among non-randomly scheduled facilitation visits. This is not surprising given that they were financially motivated to honor these visit times (and, anecdotally, collectors counted on this component of their wage since they could easily control it, whereas they viewed the performance wage linked to payments as riskier). The share of random visits honored also does not appear to vary by treatment (Table A8, Column 1). Most importantly, we observe no systematic differences in our treatment effects on compliance and revenue among properties assigned to (and receiving) randomly scheduled facilitation visits (Table A8, Columns 2-7). Altogether, there is little evidence of endogenous collector effort responses to the tax system treatments.

Fraudulent Payments. One endogenous collector response we did not anticipate is that, in some cases, collectors paid their own money in lieu of the taxpayer in order to receive the performance wage. They did this because for 19% of buildings the performance wage was greater than the tax liability. Such "excess wages" occurred because in the last step in the process of setting performance wages — in which we adjust the neighborhood average to equate expected wages across treatments — we unintentionally lifted collector incentives above liabilities for very low-value buildings. In essence, we set wages higher than liabilities for some low-value buildings to equate expected wages across treatments. Because this problem only occurred for low-value properties with very low liabilities, it is unlikely to explain our main revenue results, especially the increase in revenue observed among medium- and high-value properties in Progressive.

Nonetheless, together with the tax authority, we investigated such fraudulent payments intensively during the campaign, and we address the problem in several ways in our analysis. First, when we learned of the problem, we conducted an audit of all recorded payments, in which independent ODEKA enumerators visited property owners to verify that they had paid and check their receipts. From this, we learned that 2.4% and 8.8% of revenue in waves one and two (out of three) of the tax campaign

were from likely fraudulent payments (Figure A16). The behavior was more common in wave two because collectors were only paid their wages at the end of a wave. In wave one, it was uncertain whether they would receive the performance wage for fraudulent payments, and only a few collectors tried it (with a few buildings). Once those pioneers received the wage for these wave one cases, the behavior became more widespread in wave two.[41] After the investigation, the tax authority fired the eight collectors who committed the most fraud, and none of the fraudulent payments were included when calculating wages. We also changed the incentive scheme to eliminate excess wages in wave three.[42]

To account for fraudulent payments in our analysis, we use the audit results to trim high-probability fraud cases symmetrically across treatments. The most important issue is that excess wages occurred more often in Progressive because it had the lowest tax liabilities. If we simply dropped all confirmed fraudulent payments, we would be trimming the sample differently by treatment. We therefore first calculate counterfactual excess wages in Proportional and Status Quo *as if they had been in Progressive*. Since in Band 1, the tax rate is always lower in Progressive, any building that was an excess wage in reality would also be tagged as an excess wage according to this counterfactual measure. Second, we predict which of these counterfactual excess wage cases would have been fraudulent payment using household and collector characteristics. Specifically, we regress confirmed fraud cases on collector dummies and a range of household characteristics in Progressive. We then use the coefficients to predict likely counterfactual fraud cases in the other two treatment groups. We then drop all of these cases from our analysis symmetrically across treatments. This is the approach we take in our main specification.

We also show robustness to different approaches in Table A9. First, we show results with no fraud adjustment. Second, we include tax campaign wave fixed effects and tax collector fixed effects, given that opportunities for fraud varied by wave and by collector assignment.[43] Third, we drop Band 1 of wave two entirely, as it was the wave most affected by fraud and all excess wage opportunities were in Band 1 (Figure

[41] A companion paper explores the diffusion of fraud throughout collectors' social networks (Kapon et al., 2025).

[42] To be precise, we kept intact the underlying structure of performance wages but lifted the wage level in all neighborhoods with any excess wage cases by a constant. We then also slightly shifted up the level in unaffected neighborhoods to preserve equality of expected wage by neighborhood and across treatments.

[43] Some collectors were randomly assigned to a series of neighborhoods with zero opportunities for fraud.

A16). Finally, we simply recode fraud as no compliance — our most conservative check, given that fraud is more prevalent in Progressive than other treatment arms. The revenue and compliance gains from Progressive remain large and significant across these different approaches.

Spillovers. Another important concern is that the neighborhood-level randomization could have led to spillovers — SUTVA violations — that complicate our evaluation of these three tax rate systems. If taxpayers in Proportional were aware and jealous that people in other neighborhoods were in Progressive, their tax compliance might have been lower than it would have been if the whole city had been in Proportional. Similarly, if taxpayers in Progressive felt lucky to be under their preferred tax system while others were not, their tax compliance could have been artificially high.

We investigate the importance of spillovers in three ways. First, we examine whether taxpayers had knowledge of their own tax system and others' tax systems — a necessary condition to have spillovers in this context. At endline, respondents reported how they perceived the 2024 tax system. Their responses reveal very low knowledge of the tax system in their own neighborhood: only a little over a third of respondents correctly identified the tax system — not much better than randomly guessing (Figure A18). Such limited awareness even of one's own tax system lowers the probability of possible SUTVA violations. Moreover, at midline, taxpayers reported whether they had had any recent discussions about the property tax with people living in other neighborhoods (and, if so, what they had discussed). Only 17% of people reported having had such discussions, and they were not more likely to do so in Progressive neighborhoods. The most common topics were how to calculate tax liabilities and value properties — but this also did not differ between Progressive and Proportional.[44] Our main results are robust to flexibly controlling for whether respondents reported such conversations (Table A11).

Second, we hone in on taxpayers for whom the differences in tax systems could have been more salient: owners of multiple plots. Our main results are also not driven by owners of multiple plots (who might have been exposed to multiple treatments) (Tables A4 and A5, Column 7)

Third, we leverage the cluster randomization to estimate spillovers directly. Following Miguel and Kremer (2004), we exploit random variation in the number (or total bor-

[44]In both Progressive and Proportional, taxpayers were more likely to discuss tax liabilities compared to the Status Quo — a testament, no doubt, of the significant changes in liabilities introduced by the rollout of these new systems.

der length) of Progressive neighborhoods adjacent to non-Progressive neighborhoods, controlling for the total number of (or border length with) adjacent neighborhoods. Consistent with the previous results, exogenously having more non-Progressive neighborhoods nearby does not appear to shape compliance or revenue (Table A12). All told, we find little evidence of spillovers in our context.

Reference-Point Effects. Another possible concern is that the estimated effect of the progressive schedule partly reflects a reference-point effect relative to the prior status quo rather than a durable response to the schedule itself. Under this interpretation, taxpayers in Band 1 perceive the reform as a tax cut relative to the old system and therefore become more willing to pay because it feels like a temporary "good deal" when compared to the pre-reform benchmark. Although this explanation could explain part of the responses in Band 1, it cannot explain the revenue effects in higher bands, where tax rates in Progressive were higher than in the Status Quo. Moreover, if a reference-point effect were indeed the operative mechanism, the revenue gains should attenuate over time: once the progressive schedule becomes the new status quo, taxpayers should no longer evaluate it relative to the old regime, and the initial compliance gain should fade. However, as noted in Section 5.5, per capita revenue collected increased substantially in the subsequent year once Progressive was scaled up to the whole city.

6 Behavioral Effects of Others' Rates and the Tax Rate System

Thus far, our analysis of mechanisms concerned the mechanical and behavioral effects of a property owner's *own* tax rates. But second-order behavioral effects — i.e., the effects of *others*' rates and the tax rate system on compliance — could also influence our results if taxpayers perceive progressivity to be more fair than other tax systems and have higher tax morale in Progressive as a result. In this section, we investigate whether the compliance and revenue gains from Progressive arise because it matches taxpayers' preferences over tax rate systems and thus boosts their tax morale.

To explore this possibility, we first exploit the flier experiment discussed in Section 3.3, which varied whether property owners receive (*i*) a message about the property tax (control), (*ii*) their building's location in the distribution of building values (alter-

native control), or (*iii*) the distribution of tax rates in their neighborhood's tax system (treatment). If awareness of the distribution were driving the compliance responses in Progressive, then we should see a disproportionately large effect when owners receive information treatment (*iii*) on the back of their tax bill. However, compliance levels in Progressive and Proportional are very similar among owners who got the control and treatment flier information (Figure A17). This is true on average and throughout the distribution. This helps to rule out the possibility of offsetting responses: low-value owners increasing compliance upon learning that others face higher rates, and high-value owners reducing compliance upon learning that others face lower ones.

Why are property owners not more likely to pay when they learn about the progressivity of the system? There are three possibilities. First, they may not actually prefer the progressive system (*preferences*). Second, they might be unaware that the system in their neighborhood was progressive — because the tax bill information treatment was too complicated or too poorly delivered by collectors (*salience*). Third, they might prefer progressivity but this preference is inframarginal in the decision of whether or not to pay (*inframarginality*).

Regarding citizens' *preferences*, baseline survey evidence strongly suggested that the majority of taxpayers preferred progressive property taxation; they also viewed it as substantially more fair than the status quo system (Figure A7). However, it is possible that the idea of progressivity was too hypothetical when we elicited these preferences in the baseline survey, while now after its implementation citizens have better defined preferences. We assess this possibility first by estimating causal effects on endline views of the fairness of the tax system. Consistent with these baseline preferences, we find a small positive causal effect on the perceived fairness of the tax system in neighborhoods assigned to Progressive, especially among lower-value properties (Figure A21).[45] We also find suggestive evidence that taxpayers who are assigned to the tax system they said they preferred at baseline are slightly more likely to pay their taxes (Table A13).

To investigate citizen preferences over progressivity further, we conducted an endline survey experiment designed to ensure a high degree of salience (and thus precisely measure preferences). Enumerators were prompted to explain the visual aids and provide examples until taxpayers understood the differences between tax systems, as measured by comprehension checks. The information experiment results echo taxpayers' baseline preferences. Taxpayers in Progressive updated positively about the fairness of the tax

[45]However, we observe no corresponding increase in tax morale (Figure A20).

system when they learned that the distribution of tax rates in their neighborhood was progressive (Figure 9). By contrast, taxpayers' perceptions of fairness in Proportional did not change when they learned about the distribution of rates in their neighborhood. Informed (treated) taxpayers in Status Quo in fact updated negatively about the fairness of the tax system. Interestingly, informed taxpayers in Progressive updated positively about the fairness of the tax system throughout the distribution. Even owners of high-value buildings viewed the tax system as more fair when the increasing system of tax rates was made salient to them. Furthermore, when asked about their plans to pay the property tax in the future, informed (treated) taxpayers in Progressive reported higher likelihood of payment — on average and throughout the distribution (Figure A23).[46] This evidence allows us to rule out the *preferences* interpretation: citizens consistently appear to prefer progressivity when it is salient to them.[47]

Regarding *salience* in 2024, the evidence suggests that property owners were indeed not aware of the information about tax systems on the back of tax bills. Indeed, taxpayers performed only slightly better than random guessing when indicating the distribution of property tax rates in their neighborhood during the 2024 campaign (Figure A18). By contrasts, what does appear to have been salient to taxpayers, however, was their own liability. Indeed, perceived and actual 2024 liabilities are highly correlated (Figure A19). Similarly, when we ask about the fairness of their own property-specific liability, endline respondents' perceptions move in tandem with the tax rate schedule of their assigned neighborhood (Figure A22): in Progressive, low-value property owners view their tax liability as fairer than high-value property owners; the comparable relationship is essentially flat in Proportional. In short, taxpayers appear more aware of their own tax rates than the tax rates of others (and the shape of the distribution of rates). This lack of tax system salience is, in a sense, a boon for our field experiment because it makes SUTVA concerns unlikely: i.e., that the responses we measure are some function of taxpayers' awareness of other systems.

Given the likely explanation that the tax system information experiment on the 2024 tax bills was simply not salient to most property owners, we repeated the experiment during the 2025 tax campaign — but with new procedures to ensure greater salience. As part of a broader effort of the government to improve field-based monitoring, tax

[46] The usual concerns about self-reported future compliance apply, of course. We take this as an expression of tax morale.

[47] These results are reassuring for the scale up of the progressive tax system: it appears unlikely that tax morale will fall as progressivity becomes more salient to taxpayers. If anything, our results suggest that tax morale could increase over time and lift up compliance across the distribution.

collectors' visits to property owners were audio-recorded by their tablets. A team of desk-based agents then listened to random samples of the audios generated by their bill delivery visits. These back-checkers listened specifically to see if the collectors were explaining the tax bill clearly, including the section about tax systems (for those in the treatment group for the tax bill experiment). Those who were rushing this section lost a small part of their wage. After a few days, all collectors carefully read and explained the tax bills. We can therefore rule out the possibility of low salience in the 2025 tax bill experiment and test the *inframarginality* explanation for limited responsiveness.

Ultimately, the 2025 results largely echo the 2024 results. Taxpayers who received information about the progressive system of tax rates were not more likely to pay than the control groups (Figure 10). We observe similar results when we restrict the sample to bill delivery visits where the owner was present and the message was therefore read directly to them as part of the bill delivery protocol (Figure 11). Even when collectors spent more time (above the median) reading the information treatment, we cannot reject a difference between treatment and control (Figure A28).[48] These results are consistent with the *inframarginality* interpretation: even when we can be confidence about the delivery of information about the newly progressive tax system to taxpayers, we observe no significant increase in tax compliance.

In sum, although taxpayers do appear to prefer progressive property taxation — and to view it as more fair than the status quo — this preference ultimately appears inframarginal in the compliance decision. Our revenue effects thus can be more clearly attributed to taxpayer responses to their *own rates*.

7 The Distribution of *Effective* Tax Rates

Although the Progressive and Proportional tax systems are statutorily less regressive than the Status Quo, to understand the true distribution of the tax burden, we need a measure that factors in compliance. We therefore turn to the effective tax rate (ETR): the amount of tax paid divided by the property value. Estimating ETRs across the distribution of property values allows us to understand whether indeed owners of high-value properties are paying a larger share of their property wealth than owners of low-value properties.

[48] The null results are also unlikely to be explained by citizens updating about their property value band: we observe slightly stronger effects for those who have priors that are correct or too high but not significantly so (Figure A29).

In fact, the ETR decreases across the distribution of property value in all tax systems (Figure 12, Panel A).[49] Even in the Progressive system, owners of higher-value properties end up paying a smaller share of their wealth than owners of lower-value properties, despite their higher statutory tax rates. This occurs because compliance declines with property value, offsetting the higher statutory tax rates at the top. This negative ETR slope is more pronounced in Progressive due to the stronger compliance response in lower value bands (Figure 4). Thus, the most progressive system statutorily is the most *regressive* in terms of ETRs.

However, ETRs do not necessarily reflect welfare changes from progressive tax reforms. To understand why, consider a simple framework based on Best et al. (2025) with two types of property owners—high-value (H) and low-value (L)—who face tax liabilities T_H and T_L respectively. Each owner decides whether to comply based on comparing the utility cost of paying taxes, $u(y_\theta - T_\theta)$, against the utility of non-compliance net of an idiosyncratic delinquency cost γ_i, where $u(y_\theta) - \gamma_i$. This delinquency cost captures tax morale, fear of penalties, social stigma, and psychological costs of rule-breaking, and varies across the population according to some distribution $F(\gamma)$. Owners comply when the delinquency cost exceeds a threshold: $\gamma_i > u(y_\theta) - u(y_\theta - T_\theta)$.

Now consider a progressive reform that reduces taxes on low-value properties ($dT_L < 0$) while increasing them on high-value properties ($dT_H > 0$). If compliance among low-value property owners is highly elastic, the ETR at the bottom may actually *increase* despite the tax reduction. This occurs because the compliance gain dominates the statutory rate reduction in the formula $\text{ETR}_L = c_L T_L / y_L$. However, welfare for low-value property owners unambiguously improves: owners who were already compliant now pay less in taxes, while newly compliant owners reveal through their choice that they prefer paying the lower tax to bearing their delinquency cost. By revealed preference, no one voluntarily switches to a worse outcome. Meanwhile, at the top, if compliance is relatively inelastic (as our results suggest), high-value property owners who remain compliant are unambiguously worse off, paying higher taxes. With standard welfare weights ($g_H < g_L$), the progressive system increases welfare (see Appendix A5 for details).

That said, reducing the gap between statutory and effective tax rate distributions is an important administrative objective. When the provincial assembly adopts a progressive rate schedule, the role of the tax authority is to implement that schedule

[49] In many countries, ETRs decline at the very top of the distribution because large taxpayers are better able to engage in profit shifting and international tax planning (Bachas et al., 2025).

in practice. A large divergence between statutory and effective tax rates therefore represents a failure of policy implementation: the tax system that exists on paper is not the one taxpayers actually face. Such divergences may in turn undermine the credibility and legitimacy of the tax system in the eyes of both citizens and political authorities.

What, if anything, can the government do to counter such ETR regressivity? A natural solution is enforcement, particularly targeted at the top of the distribution where compliance is lowest. In the next section we consider whether enforcement offers the tax authority a tool to flatten or rotate the distribution of effective tax rates.

8 Can Enforcement Rotate the ETR Distribution?

We consider a series of enforcement interventions embedded in the 2024 and 2025 tax campaigns. One of these interventions (in 2024) was uniform — it applied across the value distribution — while three of these interventions (in 2025) were targeted. We examine how each shape the distribution of compliance, revenue, and the ETR curve.

8.1 Uniform Enforcement

In 2024, we cross-randomized deterrence messages on the backs of tax bills (right above the messages about the tax system). This message informed treated taxpayers that their property had been selected to receive a visit from a separate enforcement team if they remained delinquent after the payment deadline. This team did indeed complete the majority of these visits in the last days of the 2024 tax campaign. They collected payment from many delinquent owners, though ultimately lacked any strong enforcement technology, such as seizure of vehicles or locking commercial buildings. As such, the treatment provides a modest enforcement shock to roughly half of property owners. Because this message was fully cross-randomized on tax bills independent of property value, it represents a uniform enforcement policy.

Properties that received the enforcement message were 2.97 percentage points more likely to pay their property taxes (Figure 13). This magnitude is on par with similar deterrence tax bill experiments in other countries. Importantly, it has a larger impact on compliance among low-value properties. It raised compliance by 4.87 ppts in Band 1 compared to 0.77 ppts in other bands combined (Figure 13). This shift up in compliance at the bottom also shifts up the ETR distribution among low-value

properties. Although only a single policy, this un-targeted enforcement policy appears to disproportionately affect owners of lower-value properties and thus make the ETR distribution even more regressive.

8.2 Targeted Enforcement

In 2025, the government rolled out three targeted enforcement policies: reducing collection effort in Band 1, shop closures and asset seizure among the most valuable properties, and SMS messages about commercial building closures.

Lowering Collection Effort in Band 1

The first policy was to reduce collection effort to zero for almost all of the bottom value band. The motivation for this change was that the value of the tax liability seldom exceeded the administrative cost of recovery for properties in this band. Thus, in 2025, owners in this band did not receive tax bills or any visits from collectors.[50] They could still pay voluntarily by visiting the tax authority. This policy unsurprisingly shifts down the ETR curve in the bottom of the distribution (Figure 15).

True Enforcement of the Top 50 Properties

In 2025, the DGRKAC began true enforcement, such as locking commercial properties, among the very largest properties in the city. The process involves delivering a series of documents escalating in legal weight. If a taxpayer remains delinquent seven days after the last document is delivered, then a team of bailiffs locks the front of the commercial property or seizes assets (like motorbikes) from residential properties. To our knowledge, the DGRKAC had never taken these actions in previous years, but we verified that it locked a number of high-value commercial properties in the final months of 2025. We never observed asset seizure of residential properties but tax authority leadership insist that it is possible and will be implemented in 2026. The 50 largest properties by value were targeted for this enforcement campaign in 2025.

We compare compliance and revenue in this set to the next 200 largest properties in the city. Although the sample is small, we observe such a large treatment effect on compliance that it is statistically significant (Figure 16, Panel A). This also induces an upward slope at the very top of the ETR distribution.

[50] Owing to some disagreement about this policy within the tax authority, 10% of owners in deciles 4 to 6 (i.e., the upper half of the bottom band) were randomly selected to stay in the tax collection sample to study the cost-effectiveness of collection in 2025. The rest of the owners in deciles 4-6 did not receive bills or collector visits.

SMS Reminders about Enforcement

Finally, the tax authority sent a series of SMS reminders to randomly selected taxpayers making salient the new enforcement actions taken by the government among commercial properties. These messages mentioned that businesses had been recently sealed by the DGRKAC for failing to pay their property taxes. The messages were sent to all taxpayers but their content was more applicable to business owners. We therefore view this as a targeted enforcement intervention because high-value owners are more likely to have businesses at risk of such actions. This intervention had modest impacts on compliance and the ETR distribution (Figure 14). The net effect is to further rotate the ETR distribution.

In sum, these three targeted interventions led to an upward sloping ETR distribution in 2025 (Figure 15). Although the average level of tax compliance remains low, targeted enforcement increased compliance among the most valuable properties in the city, flipping the ETR distribution, and lifting up total revenue.

9 Conclusion

We evaluate a citywide field experiment in Kananga that randomized neighborhoods to progressive, proportional, or status-quo property-tax systems. Progressive schedules raised revenue substantially relative to both alternatives, with gains across the value distribution. At the bottom, lower rates boosted compliance enough to offset lower liabilities; at the top, mechanical liability increases dominated modest compliance losses. Taxpayers primarily responded to their own rates rather than to information about others' rates, and the revenue-maximizing rate rises with value—consistent with progressivity. Although effective tax rates decreased in property value across all tax systems, targeted enforcement policies in 2025 lifted compliance enough at the top of the distribution to flip the slope.

Although proportional property taxes are the modal system across Africa and many developing countries, our evidence indicates that progressive schedules can be revenue-maximizing while aiming to address redistributive objectives. Because the behavioral margins we detect are driven mainly by own statutory rates — a mechanism likely to travel across contexts more reliably than fairness perceptions — these results should generalize: well-designed progressive rate structures, paired with light, targeted enforcement at the top, can raise revenue and shift the distribution of the tax burden

toward the rich.

This research also raises many questions. One priority is to compare statutory reform versus targeted enforcement — and their interactions — in making the true tax burden progressive: when do rate design changes substitute for (or complement) top-end enforcement? Second, it will be important over time to quantify how a progressive, notched system capitalizes into prices and shapes real responses (improvements, mobility, sorting), and test smoother phase-ins or kinks to curb distortions. Finally, we need more research on the politics of reform: progressivity may be efficient and equitable, but do politicians adopt it — especially when it requires credible enforcement among elites? Mapping out when leaders have incentives "tax the top" we view as a first-order research objective.

References

Ajzenman, Nicolas, Guillermo Cruces, Ricardo Perez-Truglia, Darío Tortarolo, and Gonzalo Vazquez-Bare, "From Flat to Fair? The Effects of a Progressive Tax Reform," *Working Paper*, 2024.

Bachas, Pierre and Mauricio Soto, "Not(ch) your Average Tax System: Corporate Taxation under Weak Enforcement," *Working Paper*, 2019.

_ , Anders Jensen, and Lucie Gadenne, "Tax equity in low-and middle-income countries," *Journal of Economic Perspectives*, 2024, *38* (1), 55–80.

_ , Anne Brockmeyer, Roel Dom, and Camille Semelet, "Effective Tax Rates, Firm Size and the Global Minimum Tax," CEPR Discussion Paper DP20609, Centre for Economic Policy Research (CEPR) February 2025. CEPR Discussion Paper No. DP20609.

_ , Lucie Gadenne, and Anders Jensen, "Informality, consumption taxes, and redistribution," *Review of Economic Studies*, 2024, *91* (5), 2604–2634.

Balan, Pablo, Augustin Bergeron, Gabriel Tourek, and Jonathan L Weigel, "Local Elites as State Capacity: How City Chiefs Use Local Information to Increase Tax Compliance in the DR Congo," *American Economic Review*, 2022, *112* (3), 762–797.

Banerjee, Abhijit V., Sylvain Chassang, Sergio Montero, and Erik Snowberg, "A Theory of Experimenters," *Working Paper*, 2017.

Basri, M. Chatib, Mayara Felix, Rema Hanna, and Benjamin A. Olken, "Tax Administration vs. Tax Rates: Evidence from Corporate Taxation in Indonesia," *American Economic Review*, 2021, *111* (12), 3827–3871.

Bergeron, Augustin, Gabriel Tourek, and Jonathan L Weigel, "The State Capacity Ceiling on Tax Rates: Evidence from Randomized Tax Abatements in the DRC," *Econometrica*, 2024.

Besley, Timothy and Torsten Persson, "The Origins of State Capacity: Property Rights, Taxation and Politics," *American Economic Review*, 2009, *99* (4), 1218–1244.

_ and _ , "Why Do Developing Countries Tax So Little?," *Journal of Economic Perspectives*, 2014, *28* (4), 99–120.

Best, Michael Carlos, Anne Brockmeyer, Henrik Jacobsen Kleven, Johannes Spinnewijn, and Mazhar Waseem, "Production versus Revenue Efficiency with Limited Tax Capacity: Theory and Evidence from Pakistan," *Journal of political Economy*, 2015, *123* (6), 1311–1355.

Best, Michael, Luigi Caloi, Francois Gerard, Evan Kresch, Joana Naritomi, and Laura Zoratto, "Greener on the Other Side: Inequity and Tax Compliance," *Working Paper*, 2025.

Brockmeyer, Anne, Alejandro Estefan, Juan Carlos Suárez Serrato, and Karina Ramirez, "Taxing Property in Developing Countries: Theory and Evidence from Mexico," *Working Paper*, 2023.

Danner, Sarah, Arthur Laroche, Marina Ngoma, Dina Pomeranz, Gabriel Tourek, and Jonathan Weigel, "Optimal Tax Administration with Cash-on-Hand Constraints," *Working Paper*, 2025.

Fish, Paul, Nyah Zebong, and Wilson Prichard, "Valuation for property tax purposes," *ICTD Summary Brief 10*, 2017.

Fisher-Post, Matthew and Amory Gethin, "Government Redistribution and Development: Global Estimates of Tax-and-Transfer Porgressivity, 1980-2023," *Working Paper*, 2025.

Fjeldstad, Odd-Helge, Merima Ali, and Tom Goodfellow, "Taxing the Urban Boom: Property Taxation in Africa," *Chr. Michelsen Institute (CMI) Insight*, 2017.

Franzsen, Riel and William McCluskey, *Property Tax in Africa: Status, Challenge, and Prospects*, Lincoln Institute of Land Policy, 2017.

Gordon, Roger and Wei Li, "Tax Structures in Developing Countries: Many Puzzles and a Possible Explanation," *Journal of Public Economics*, 2009, *93* (7), 1409–1448.

Grieco, Kevin, Amou Bakarr Kamara, Niccoló F Meriggi, Julian Michel, Wilson Prichard, and Graeme Stewart-Wilson, "Simplifying property tax administration in Africa: piloting a points-based valuation in Freetown, Sierra Leone," *ICTD Summary Brief 19*, 2019.

Hoy, Christopher, "How does progressivity impact tax morale? Experimental evidence across developing countries," *Journal of Development Economics*, 2025, *172*, 103398.

Jensen, Anders, "Employment structure and the rise of the modern tax system," *American Economic Review*, 2022, *112* (1), 213–234.

Kapon, Sam, Binta Zahra Diop, Augustin Bergeron, Gabriel Tourek, and Jonathan Weigel, "The Diffusion of Fraud: Evidence from Congolese Tax Collectors," *Working Paper*, 2025.

Khan, Adnan Q, Asim I Khwaja, and Benjamin A Olken, "Tax Farming Redux: Experimental Evidence on Performance Pay for Tax Collectors," *The Quarterly Journal of Economics*, 2015, *131* (1), 219–271.

Kleven, Henrik J and Mazhar Waseem, "Using Notches to Uncover Optimization Frictions and Structural Elasticities: Theory and Evidence From Pakistan," *The Quarterly Journal of Economics*, 2013, *128* (2), 669–723.

Knebelmann, Justine, "Digitalisation of property taxation in developing countries: Recent advances and remaining challenges," *ODI Report*, 2022.

Manning, Willard G and John Mullahy, "Estimating log models: to transform or not to transform?," *Journal of health economics*, 2001, *20* (4), 461–494.

Miguel, Edward and Michael Kremer, "Worms: identifying impacts on education and health in the presence of treatment externalities," *Econometrica*, 2004, *72* (1), 159–217.

Moore, Mick, Wilson Prichard, Odd-Helge Fjeldstad et al., "Taxing Africa," *University of Chicago Press Economics Books*, 2018.

Muralidharan, Karthik, Mauricio Romero, and Kaspar Wüthrich, "Factorial Designs, Model Selection, and (Incorrect) Inference in Randomized Experiments," *The Review of Economics and Statistics*, May 2025, *107* (3), 589–604.

Nielsson, Ulf, Caleb Wroblewski, and Anders Yding, "The Incidence and Efficiency of Land Value Taxation," 2024. Mimeo: UC Berkeley.

Oates, Wallace E and Robert M Schwab, "The impact of urban land taxation: The Pittsburgh experience," *National Tax Journal*, 1997, *50* (1), 1–21.

Palomo, Theo, David Bhering, Thiago Scot, Pierre Bachas, Luciana Barcarolo, Celso ampos, Javier Feinmann, Leonardo Moreira, and Gabriel Zucman, "Tax Progressivity and Inequality in Brazil: Evidence from Integrated Administrative Data," *Working paper*, 2025.

Prichard, Wilson, "Property Taxes for Development: Building the Foundation for Accelerated Subnational Development," *LOGRI Policy Brief*, 2025.

_ , Abou Bakarr Kamara, and Niccol Meriggi, "Freetown just implemented a new tax system that could quintuple revenue," *African Arguments*, May 21 2020. Accessed 10 July 2025.

_ , Adele Somat, and Xaver Schenker, "Implementing a Simplified Valuation System for Property Taxation Using a Point-Based Method in Kananga, DRC," *LoGRI Policy Brief*, 2025.

Qiu, Xincheng and Nicolo Russo, "Income Taxation Across Countries," *Working Paper*, 2024.

Regan, Tanner, "The Economic Consequences of Statistical Property Valuation: Evidence from Kampala, Uganda," *Working Paper*, 2020.

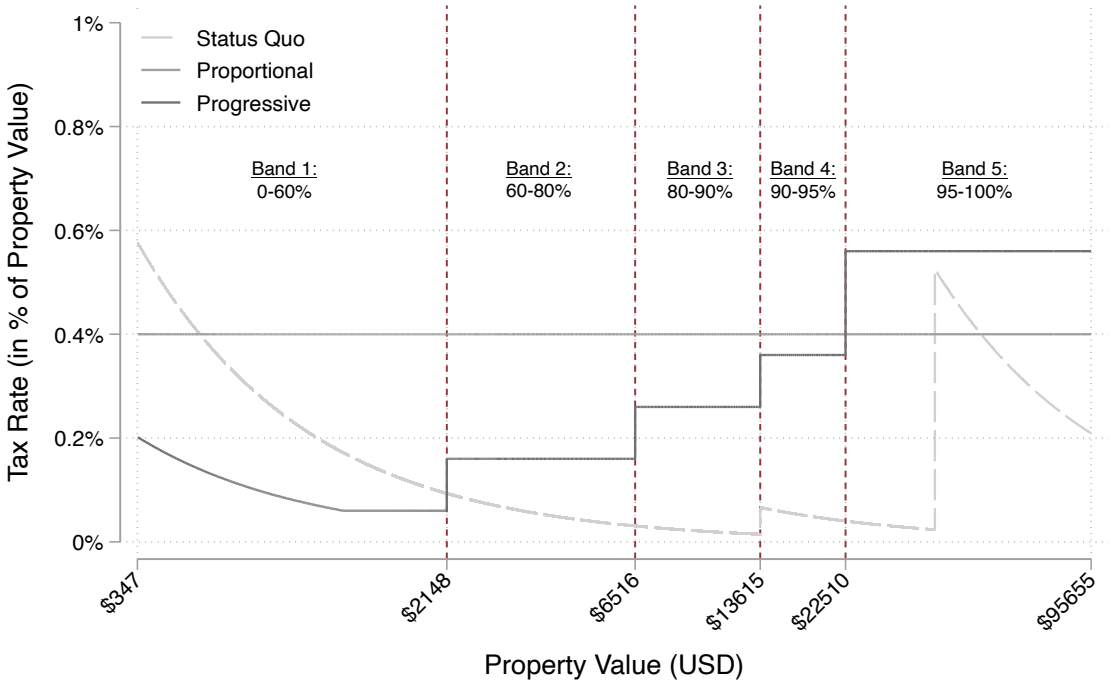
Scheve, Kenneth and David Stasavage, "The conscription of wealth: mass warfare and the demand for progressive taxation," *International organization*, 2010, *64* (4), 529–561.

Weigel, Jonathan L, "The Participation Dividend of Taxation: How Citizens in Congo Engage More with the State when it Tries to Tax Them," *Quarterly Journal of Economics*, 2020.

Zolt, Eric M and Richard M Bird, "Redistribution via taxation: The limited role of the personal income tax in developing countries," *UCLA Law Review*, 2005, *52*, 05–22.

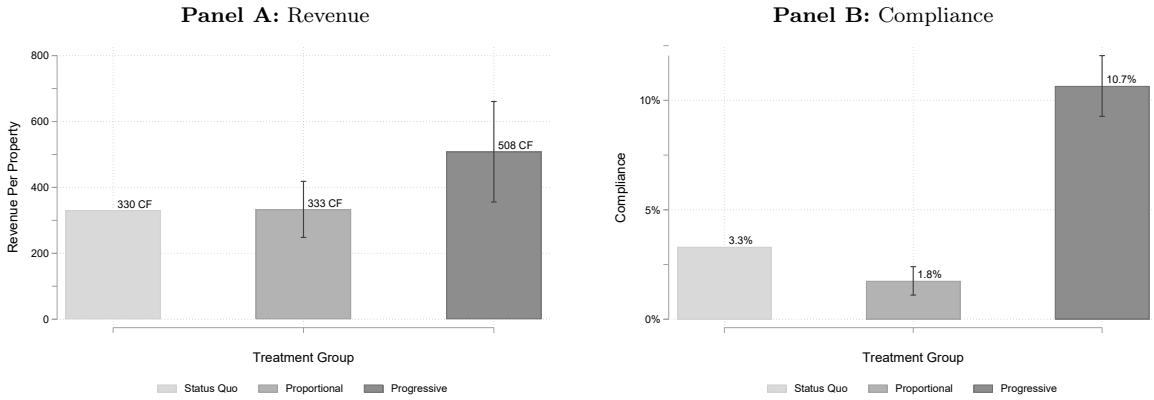
10 Exhibits

Figure 1: Three Tax Systems: Tax Rates



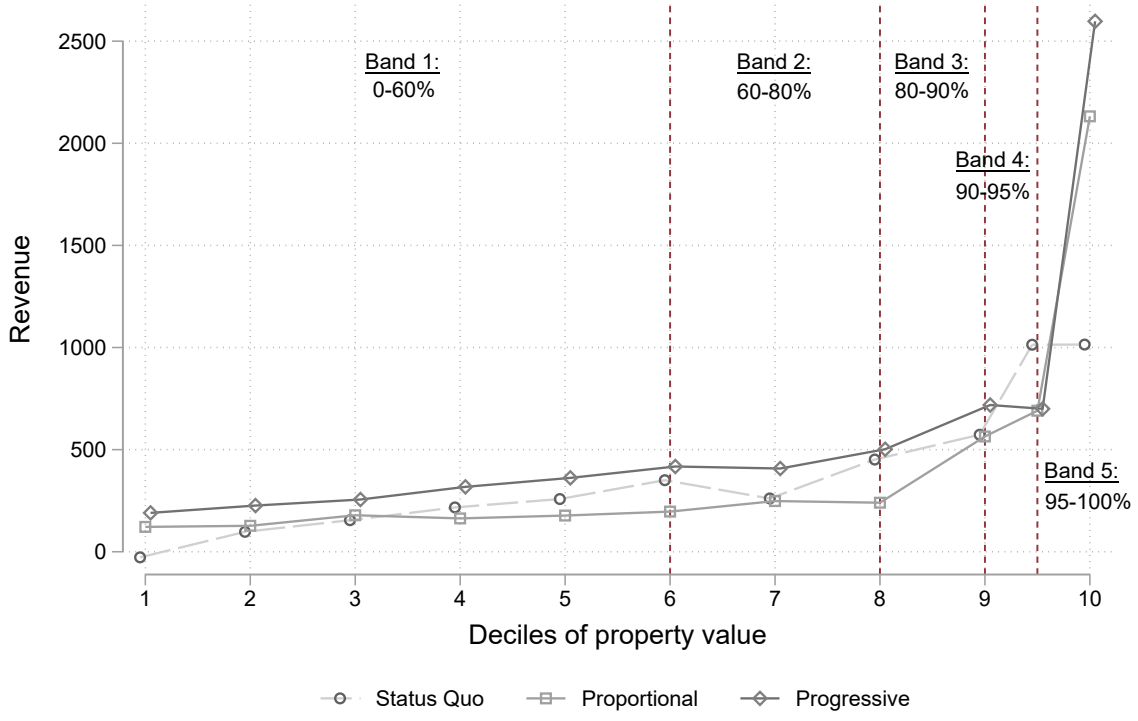
Notes: This figure shows tax rates across the three tax systems in the 2024 property tax campaign. The y-axis is the tax rate (in % of property value), and the x-axis is log property value (labeled with USD amounts for clarity). Vertical dashed lines indicate the five value bands. The solid gray line indicates the (flat) Proportional tax rate; the solid black line indicates the Progressive tax rate schedule; and the dashed gray line indicates the implied tax rate in the Status Quo fee schedule (expressed in % of property value). The Progressive schedule decreases in property value at the very bottom because the government imposed a minimum tax amount of 2,000 CF or $0.70 to cover the cost of recovery. We discuss this figure in Section 3.

Figure 2: Treatment Effects on Tax Revenue and Compliance



Notes: This figure shows the average revenue raised per property (Panel A) and compliance rate (Panel B) by treatment group. The sample includes all assessable residential buildings that received a tax bill in the 2024 property tax campaign. Other details about the estimation can be found in Section 5.1. Figure A15 shows the analogous figures without adjusting for lower average tax liabilities in Status Quo as described in Section A4.1. We discuss this figure in Section 5.2.

Figure 3: Tax Revenue by Treatment and Building Value



Notes: This figure summarizes the average revenue raised per property by treatment and decile of the building value distribution. The vertical lines correspond to the value bands used in the progressive tax system. The sample includes all assessable residential buildings that received a tax bill in the 2024 property tax campaign. Table 1 shows the corresponding treatment effects. Other details about the estimation can be found in Section 5.1. We discuss this figure in Section 5.2.

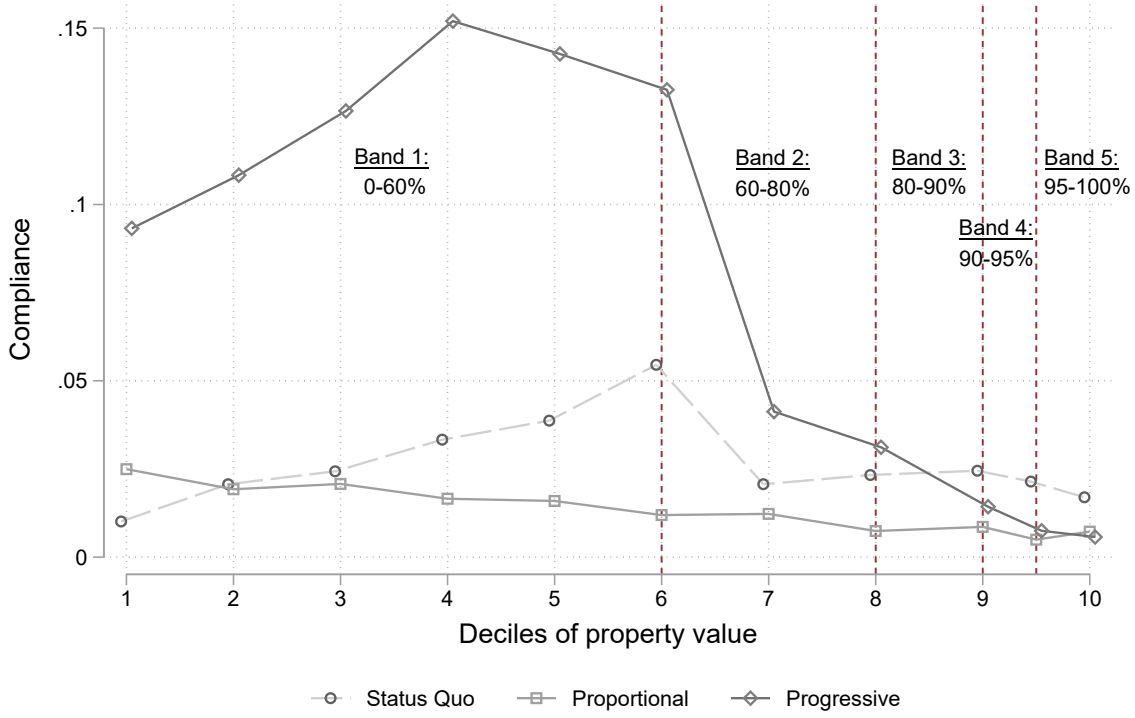
Table 1: Treatment Effects on Tax Revenue by Decile of Building Value

		Decile of Property Value										
		Band 1: 0–60%						*Band 2: 60–80%*		*Band 3: 80–90%*	*Band 4: 90–95%*	*Band 5: 95–100%*
	All Deciles Pooled	1	2	3	4	5	6	7	8	9	9.5	10
Panel A: Proportional vs Progressive												
Progressive	175.154**	66.299**	97.886***	77.658**	155.779***	187.346***	220.483***	157.549***	259.983***	154.170	14.970	340.554
	(78.026)	(27.469)	(25.570)	(33.695)	(31.682)	(38.653)	(50.502)	(55.959)	(81.476)	(159.108)	(333.434)	(1311.673)
Observations	77698	7543	7738	7836	7883	7898	7853	7825	7783	7831	3787	3721
Control Mean	311.903	114.739	117.827	172.383	161.226	175.128	195.403	260.753	243.802	558.662	620.415	1630.929
Panel B: Status Quo vs Proportional and Progressive												
Proportional	18.238	31.652	1.965	16.790	-8.249	0.135	-42.327	-4.881	-17.016	113.194	-314.828	624.290
	(46.991)	(25.014)	(26.089)	(32.696)	(26.982)	(31.596)	(41.874)	(45.787)	(61.265)	(125.382)	(277.866)	(754.101)
Progressive	195.960**	98.689***	100.515***	94.410***	147.382***	186.119***	176.625***	151.667***	245.722***	271.131**	-295.306	1101.337
	(80.036)	(20.825)	(27.090)	(25.079)	(25.967)	(31.333)	(43.294)	(44.367)	(62.694)	(129.949)	(264.322)	(1513.476)
Observations	96295	9460	9613	9716	9738	9776	9740	9688	9616	9642	4653	4653
Control Mean	312.831	93.412	125.595	159.516	169.419	176.774	241.283	254.808	256.759	448.946	998.909	1478.833

All regressions include stratum fixed effects. Standard errors are clustered at the polygon level.
***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Notes: This table shows treatment effects on revenue across deciles of building value. Panel A summarizes results from estimating Equation 2, comparing Progressive and Proportional, while Panel B includes the comparison to the Status Quo. The sample includes all assessable residential buildings that received a tax bill in the 2024 property tax campaign. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this figure in Section 5.2.

Figure 4: Tax Compliance by Treatment and Building Value



Notes: This figure shows compliance rates by treatment and decile of the building value distribution. The vertical lines correspond to the value bands used in the progressive tax system. The sample includes all assessable residential buildings that received a tax bill in the 2024 property tax campaign. Table 1 shows the corresponding treatment effects. Other details about the estimation can be found in Section 5.1. We discuss this figure in Section 5.2.

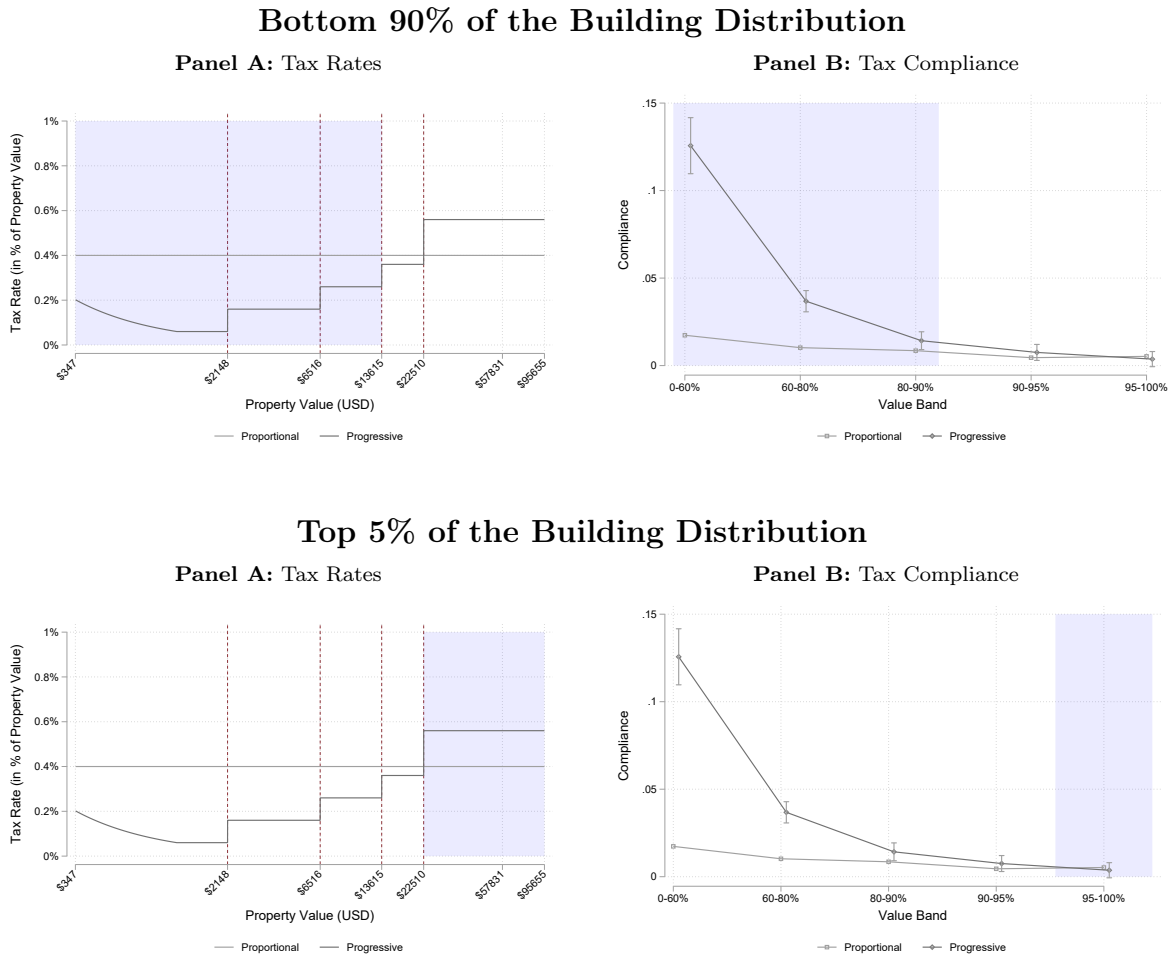
Table 2: Treatment Effects on Tax Compliance by Decile of Building Value

		Decile of Property Value										
		Band 1: 0–60%						*Band 2: 60–80%*		*Band 3: 80–90%*	*Band 4: 90–95%*	*Band 5: 95–100%*
	All Deciles Pooled	1	2	3	4	5	6	7	8	9	9.5	10
Panel A: Proportional vs Progressive												
Progressive	0.072***	0.068***	0.089***	0.106***	0.136***	0.127***	0.121***	0.029***	0.024***	0.006**	0.003	-0.002
	(0.006)	(0.009)	(0.009)	(0.010)	(0.011)	(0.011)	(0.012)	(0.004)	(0.004)	(0.003)	(0.002)	(0.002)
Observations	77698	7543	7738	7836	7883	7898	7853	7825	7783	7831	3787	3721
Control Mean	0.014	0.023	0.017	0.021	0.017	0.015	0.012	0.013	0.008	0.009	0.004	0.006
Panel B: Status Quo vs Proportional and Progressive												
Proportional	-0.013***	-0.000	-0.009*	-0.010**	-0.016***	-0.013***	-0.023***	-0.014***	-0.012***	-0.016***	-0.016***	-0.001
	(0.003)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.003)	(0.004)	(0.004)	(0.005)	(0.003)
Progressive	0.058***	0.068***	0.080***	0.095***	0.119***	0.114***	0.097***	0.015***	0.012***	-0.010**	-0.014**	-0.002
	(0.006)	(0.009)	(0.009)	(0.010)	(0.011)	(0.011)	(0.012)	(0.005)	(0.005)	(0.004)	(0.006)	(0.003)
Observations	96295	9460	9613	9716	9738	9776	9740	9688	9616	9642	4653	4653
Control Mean	0.027	0.026	0.028	0.031	0.032	0.029	0.035	0.026	0.019	0.024	0.021	0.007

All regressions include stratum fixed effects. Standard errors are clustered at the polygon level.
***, **, and * indicate significance at the 1, 5, and 10 percent levels.

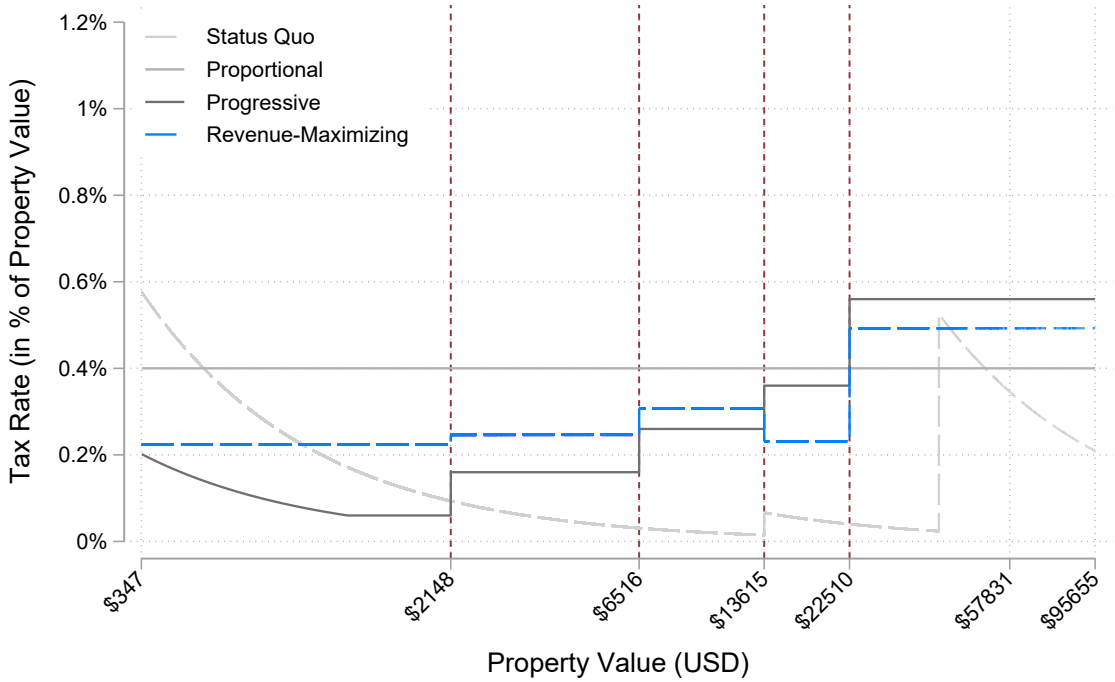
Notes: This table shows treatment effects on tax compliance across deciles of building value. Panel A summarizes results from estimating Equation 2, comparing Progressive and Proportional, while Panel B includes the comparison to the Status Quo. The sample includes all assessable residential buildings that received a tax bill in the 2024 property tax campaign. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this figure in Section 5.2.

Figure 5: Mechanical v. Behavioral Effects Throughout the Distribution



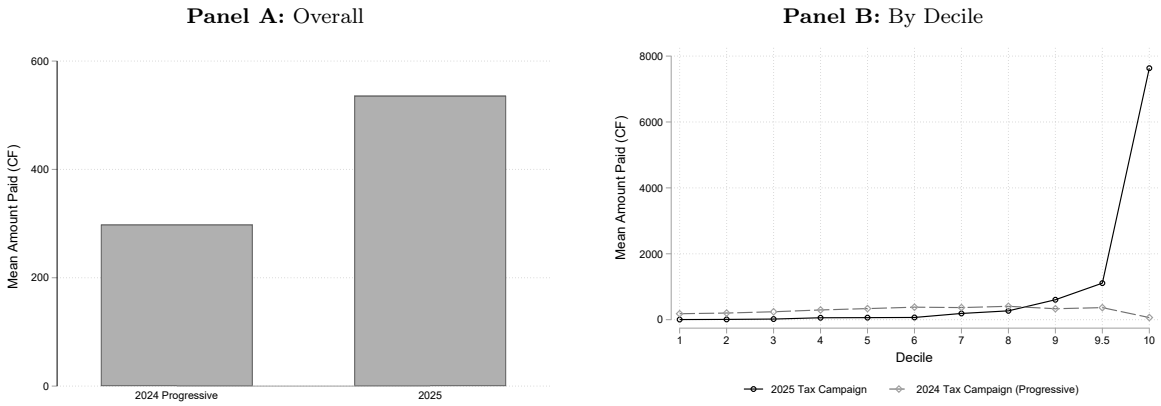
Notes: This figure illustrates how competing mechanical and behavioral effects from tax rate changes drive revenue responses at different parts of the building value distribution. The top two graphs focus on the bottom 90% of the value distribution, in which the behavioral effect (higher compliance) dominates the mechanical effect of lower tax rates. The bottom two graphs focus on the top 5% of the value distribution, in which the mechanical effect of higher tax rates dominates the behavioral effect. In Band 4 (percentile 90-95%), the tax liability is essentially identical. We discuss this figure in Section 5.2.

Figure 6: The Revenue Maximizing Tax Schedule



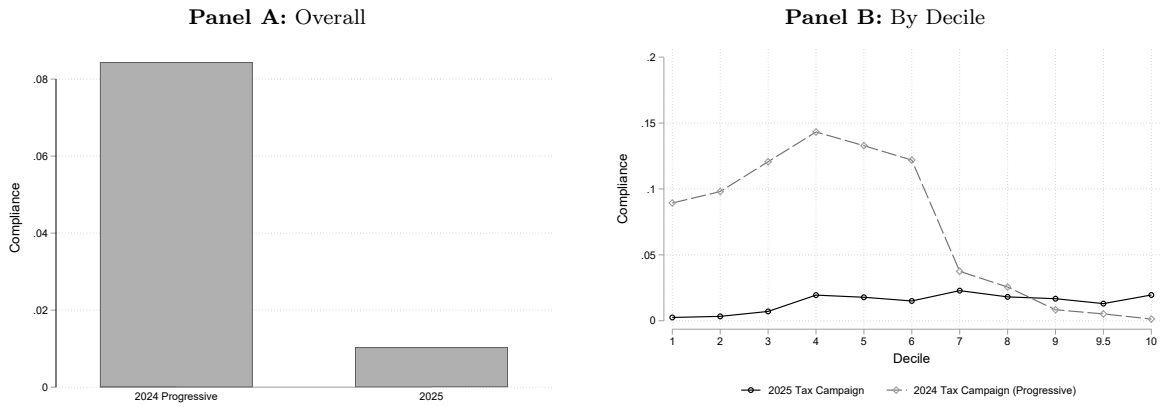
Notes: This figure overlays the revenue-maximizing tax rate (RMTR) schedule with the three tax systems that make up the 2024 Kananga field experiment. Tax schedules are labeled as in Figure 1, with the addition of the estimated RMTR in blue. We discuss the estimation that generated this figure in Section 5.4.

Figure 7: Revenue in the 2025 Tax Campaign vs 2024 Progressive Neighborhoods



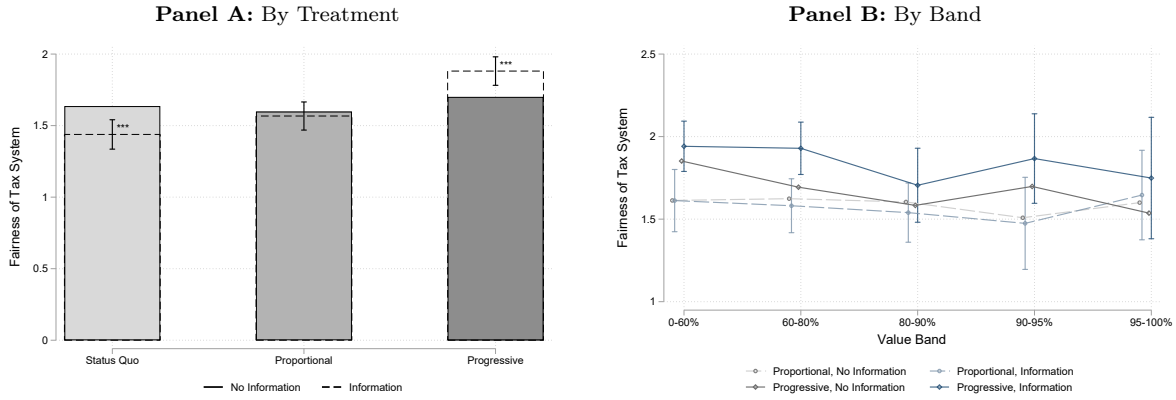
Notes: This figure shows the average revenue raised per property overall (Panel A) and by decile (Panel B) in the 2025 tax campaign vs in the progressive treatment of the 2024 tax campaign, by decile of property value. We discuss this figure in Section 5.5.

Figure 8: Compliance in the 2025 Tax Campaign vs 2024 Progressive Neighborhoods



Notes: This figure shows the average compliance per property overall (Panel A) and by decile (Panel B) in the 2025 tax campaign vs in the progressive treatment of the 2024 tax campaign, by decile of property value. We discuss this figure in Section 5.5.

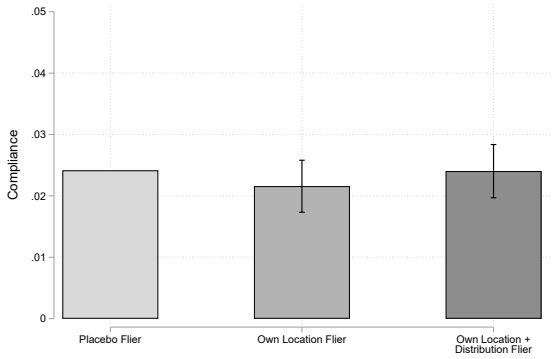
Figure 9: Endline Information Experiment: Fairness of the Tax System



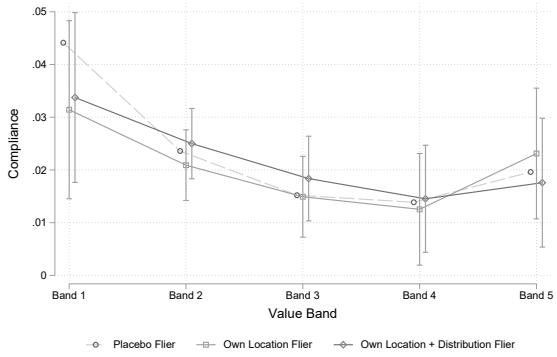
Notes: This figure summarizes the results of the endline information experiment on perceptions of the fairness of the tax system in Kananga. Panel A shows the average perceived fairness by treatment comparing taxpayers who received information about the tax system (dashed line) or not (filled bar). Panel B compares the treatment effect of information for Progressive and Proportional across value bands. We discuss this figure in Section 3.3.

Figure 10: 2025 Tax Bill Experiment: Treatment Effects on Compliance

Panel A: By Treatment



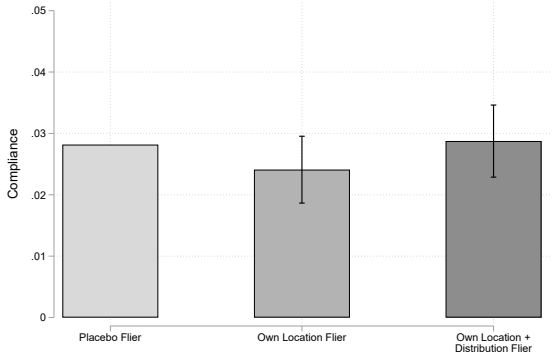
Panel B: By Band



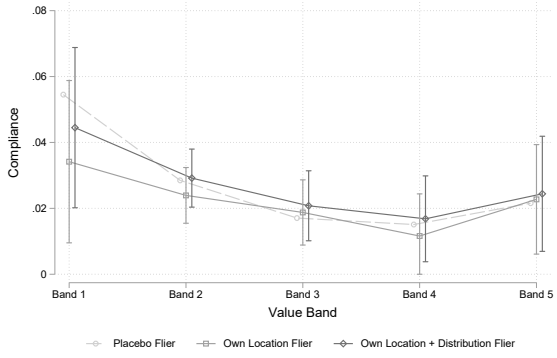
Notes:

Figure 11: 2025 Tax Bill Experiment: Treatment Effects on Compliance, Restricting to Adult Present

Panel A: By Treatment

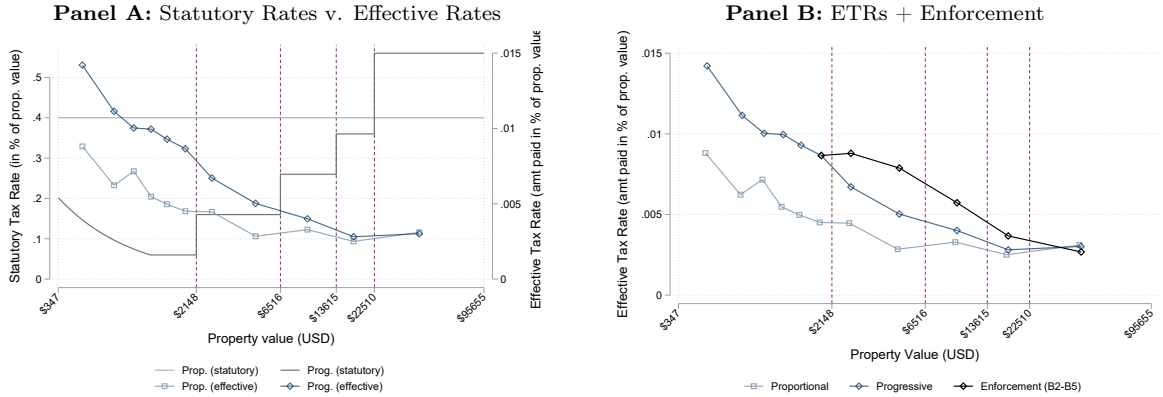


Panel B: By Band



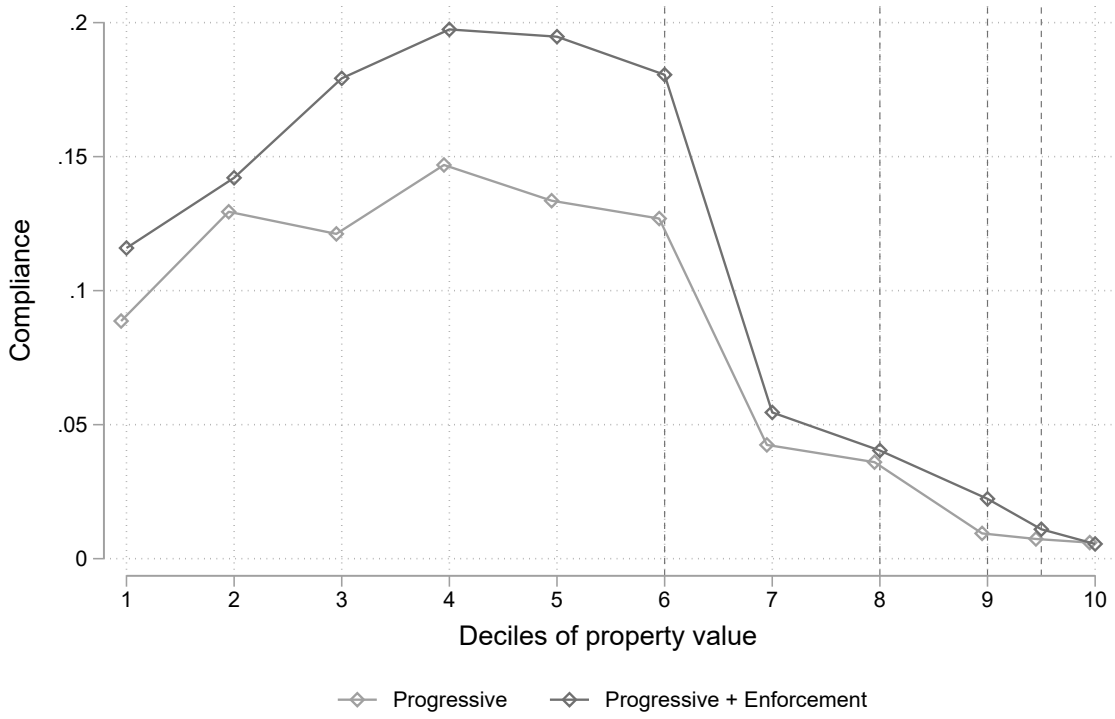
Notes:

Figure 12: Effective Tax Rates by Treatment and Value Band



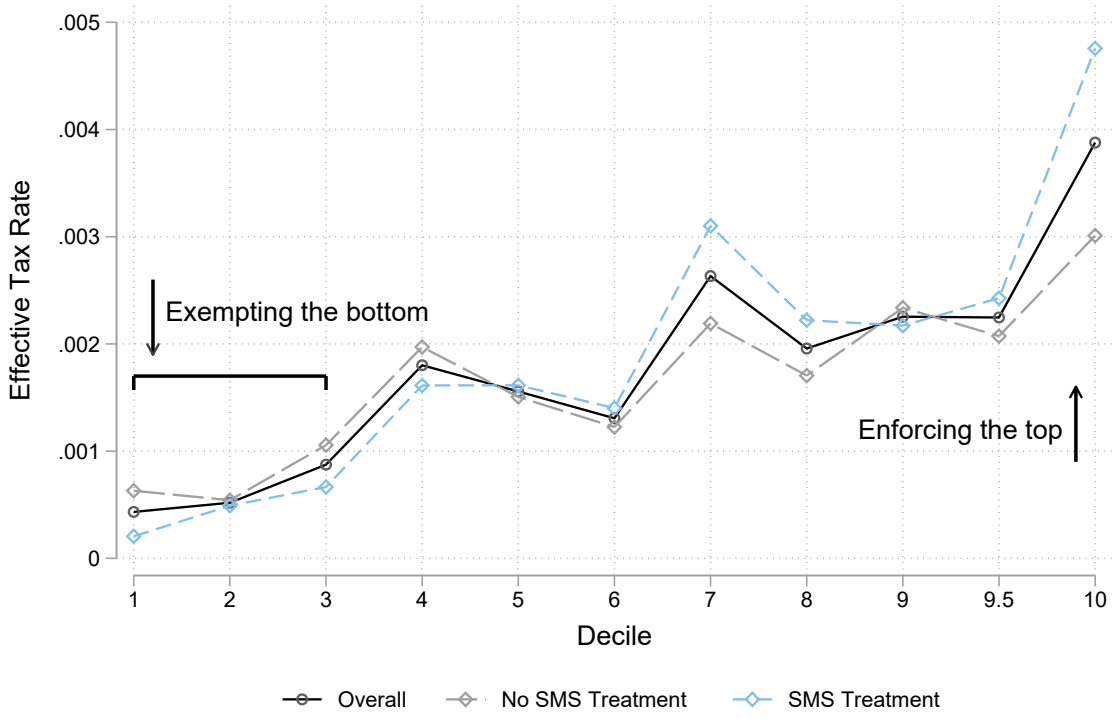
Notes: This figure plots the effective tax rate (ETR) — the tax amount paid divided by property value — over the property value distribution. Panel A compares statutory tax rate schedules under Progressive and Proportional with the distribution of the ETR. Panel B then shows how the ETR curve in Progressive shifts up among properties exposed to the enforcement intervention targeting randomly sampled owners in Bands 2-5. In Panel A, the gray lines show the statutory Proportional and Progressive tax system, corresponding to the left y-axis. In both panels, the light blue lines show the ETR for Progressive and Proportional, corresponding to the right y-axis. In Panel B, the black line shows the ETR in Progressive for property owners who received the enforcement intervention. We discuss the estimation that generated this figure in Section 7.

Figure 13: Compliance by Value Decile in the 2024 Enforcement Intervention



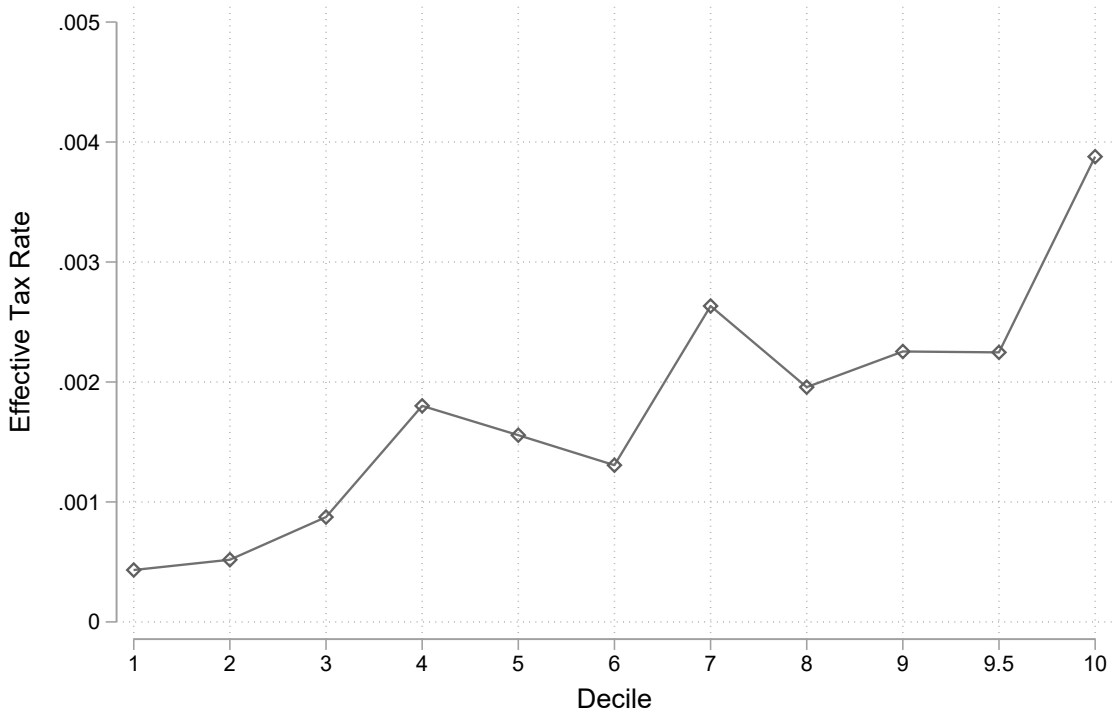
Notes: This figure plots compliance over the property value distribution in the progressive treatment arm of the 2024 tax campaign, by assignment to the enforcement intervention. We discuss this figure in Section 8.1.

Figure 14: ETR by Value Decile Under the SMS Treatment in the 2025 Campaign



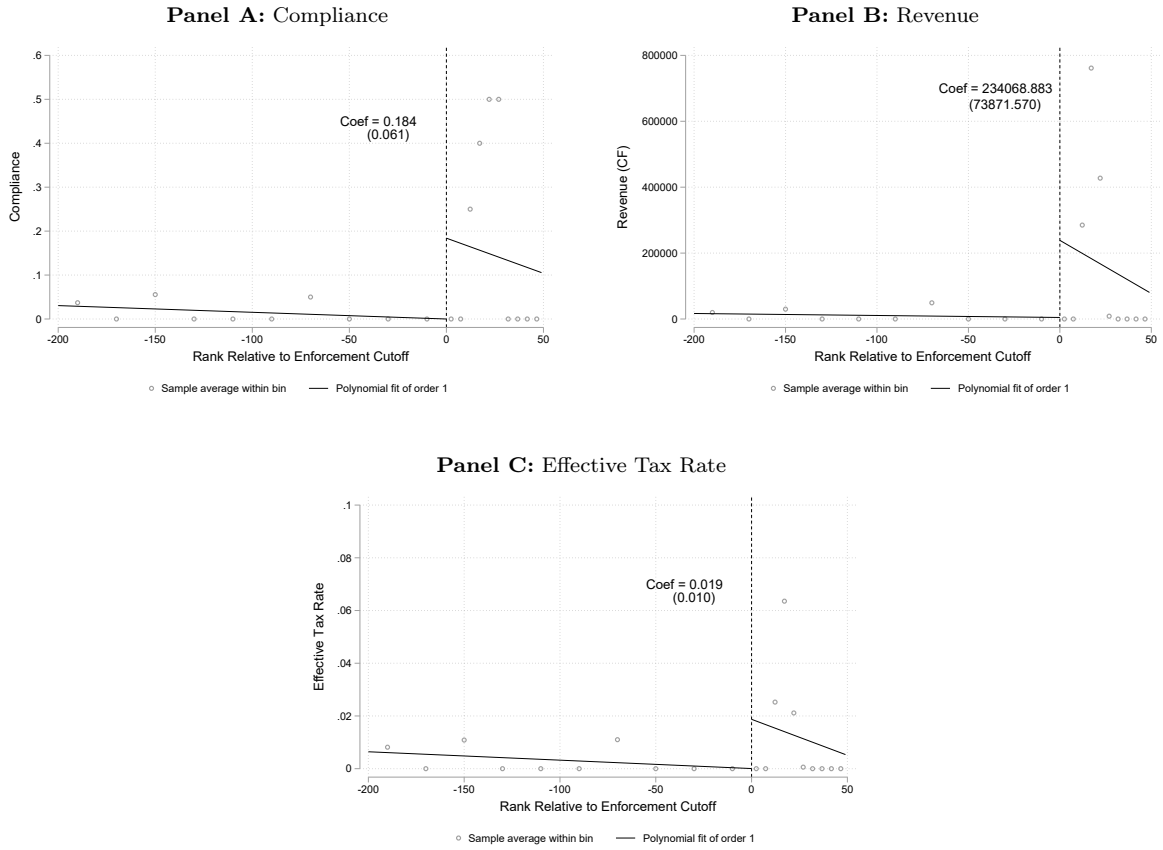
Notes: This figure plots the effective tax rate (ETR) over the property value distribution in the 2025 tax campaign, by assignment to the SMS reminder treatment. We discuss this figure in Section 8.2.

Figure 15: ETR by Value Decile in the 2025 Campaign



Notes: This figure plots the effective tax rate (ETR) over the property value distribution in the 2025 tax campaign. We discuss this figure in Section 8.2.

Figure 16: 2025 Enforcement Intervention: Treatment Effects on Compliance, Revenue, and ETR

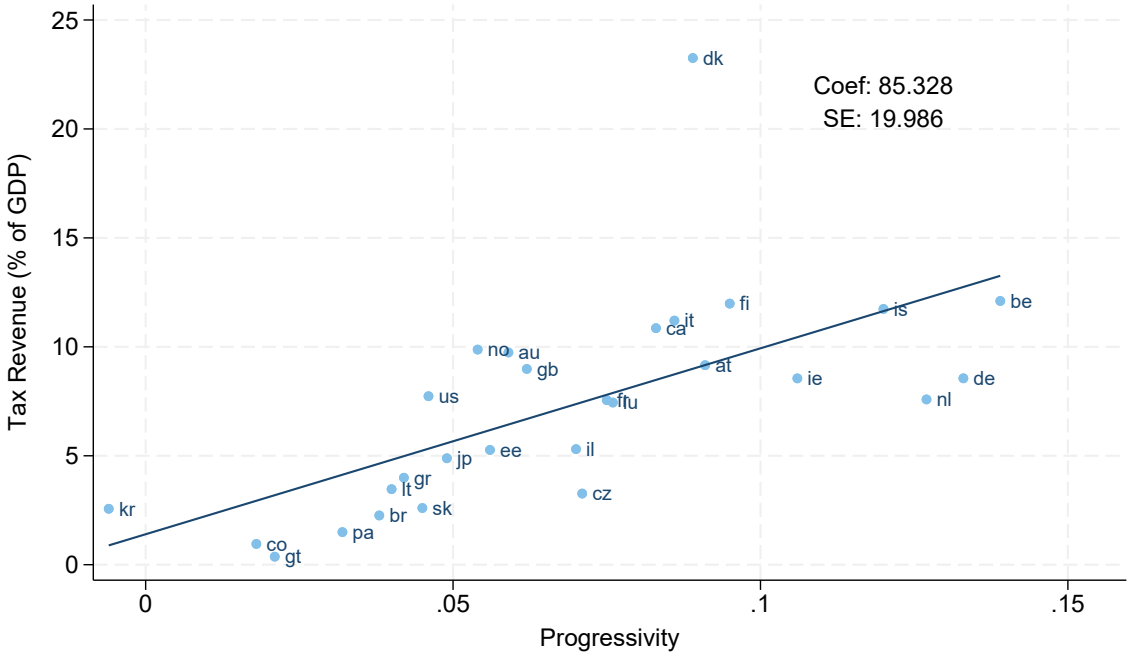


Notes: This figure presents regression discontinuity estimates around the property value cutoff used in the 2025 enforcement intervention. Residential and commercial properties were assigned property value rankings and cutoffs separately, and are pooled using their relative rankings in this figure. We discuss this figure in Section 8.2.

Appendix

A1 Additional Exhibits — Setting

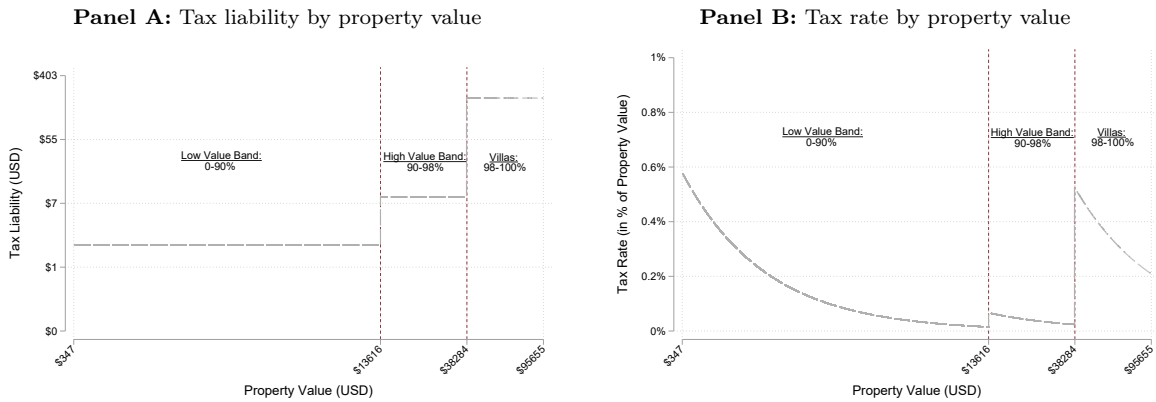
Figure A1: Progressivity and Tax Capacity: Cross-Country Relationship



Notes: This figure shows the cross-country relationship between income tax revenue as a share of GDP — a proxy for tax capacity — and the progressivity of the income tax. The data on income tax revenue (in % of GDP) come from the World Bank, while the data on the progressivity of the income tax come from Qiu and Russo (2024). The coefficient and standard error from a linear regression are shown in the top right of the graph. We discuss this figure in Section 1.

A2 Additional Exhibits — Design

Figure A2: Regressivity of the Status Quo Property Tax System



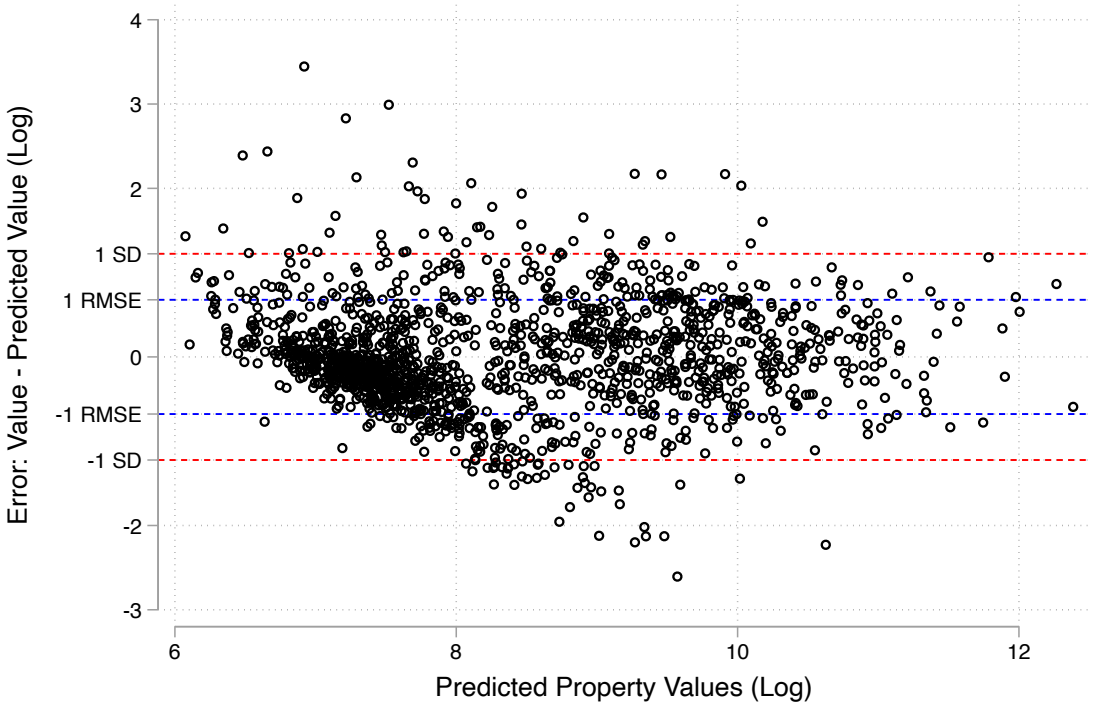
Notes: This figure visualizes the regressivity of the status quo property tax system. The left panel plots tax liability (in USD) against property value (in USD), indicating the thresholds at which different fees apply. The right panel plots the implied tax rate (in % of property value) against property value, noting the same thresholds. We discuss this figure in Section 3.

Table A1: Tax Rates in Proportional, Progressive, and Status Quo

Band	Percentiles	Rate (in % of property value)		
		Status Quo	Proportional	Progressive
1	0-60%	0.22%	0.4%	0.06%
2	60-80%	0.06%	0.4%	0.16%
3	80-90%	0.02%	0.4%	0.26%
4	90-95%	0.05%	0.4%	0.36%
5	95-100%	0.1%	0.4%	0.56%

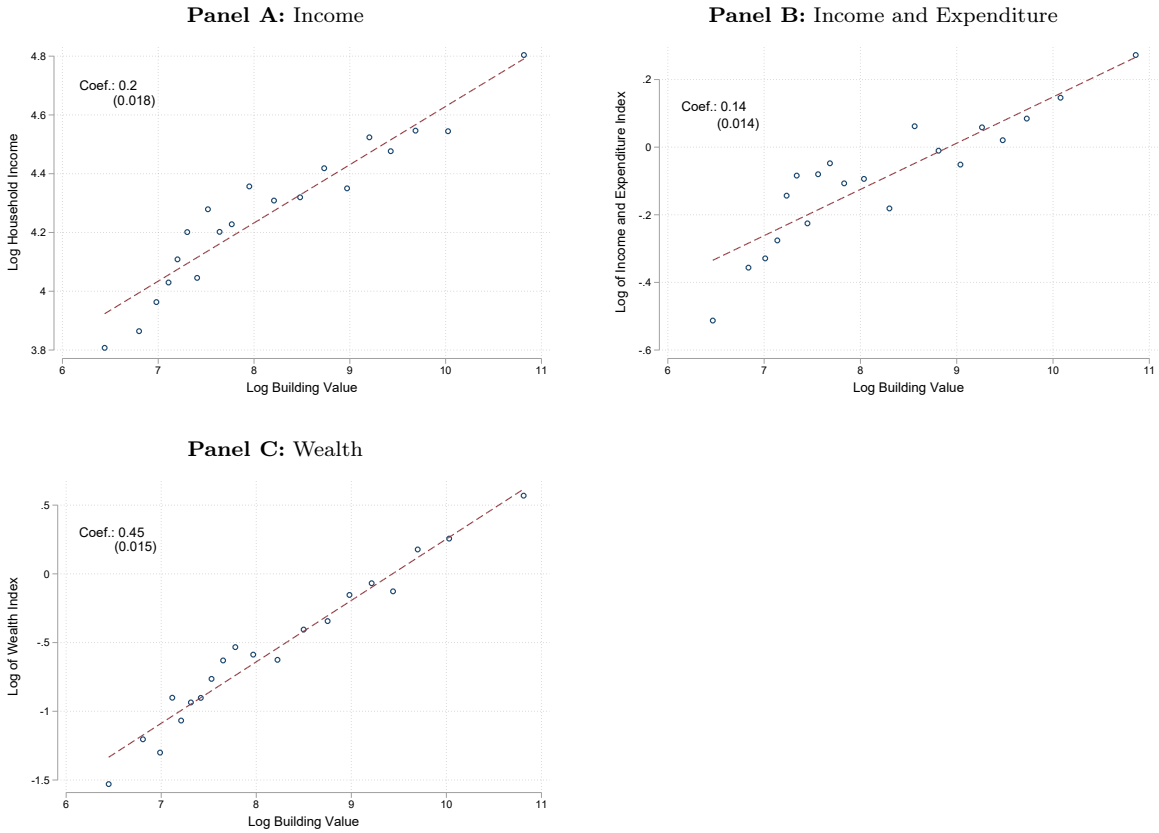
Notes: This table shows the tax rates for different bands of assessed value in Progressive, Proportional, and Status Quo. We discuss this table in Section 3.2.

Figure A3: Calibration Results: Errors



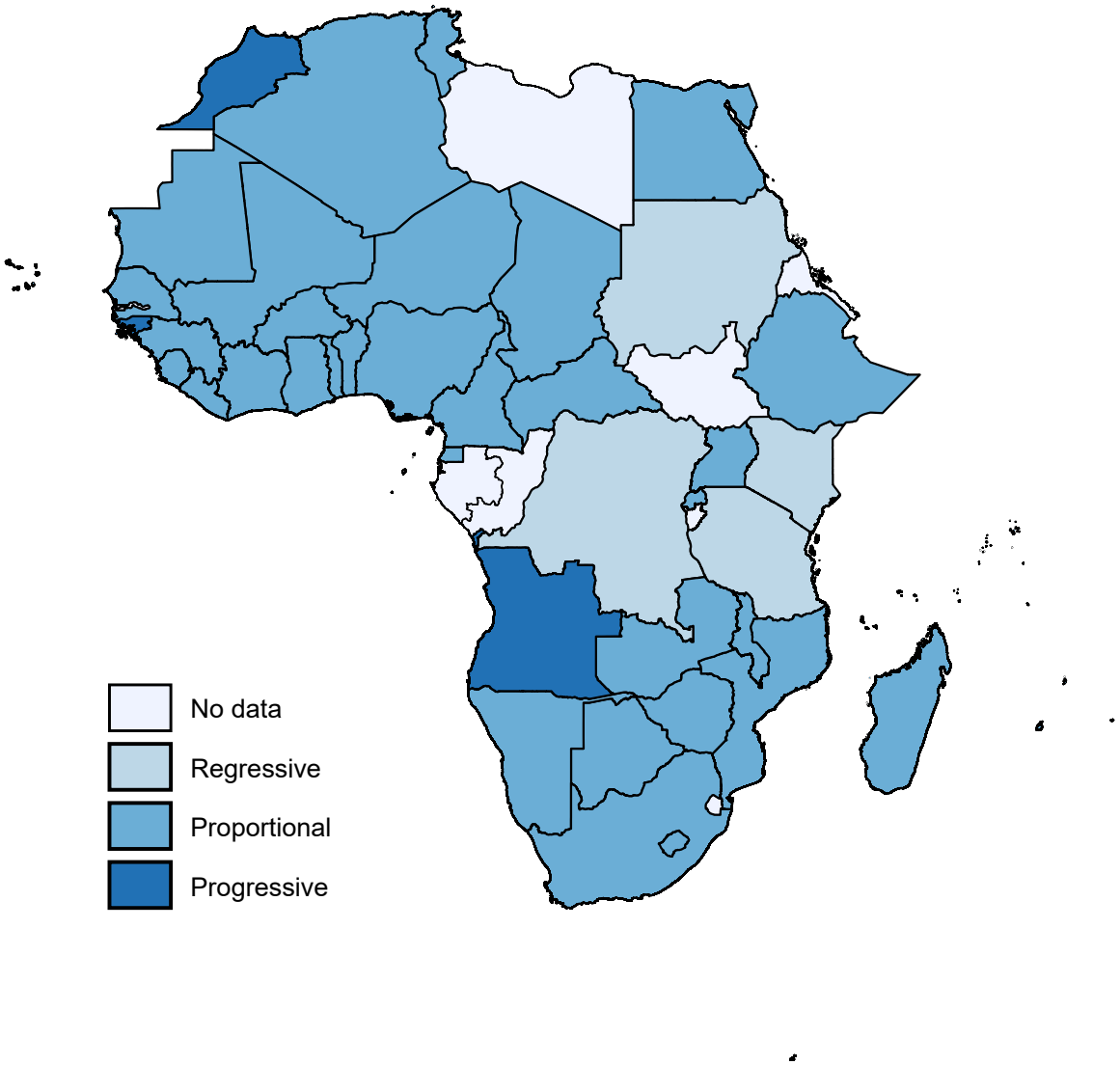
Notes: This figure visualizes the errors from the model we calibrated to predict log building values. The y-axis shows errors (the log true value - predicted value), and the x-axis shows predicted property values (in log). Horizontal dashed lines indicated 1 RMSE and 1 SD (positive and negative). We discuss this figure in Section 3.1.

Figure A4: Correlations: Predicted Property Values and Household Income, Expenditure, and Wealth



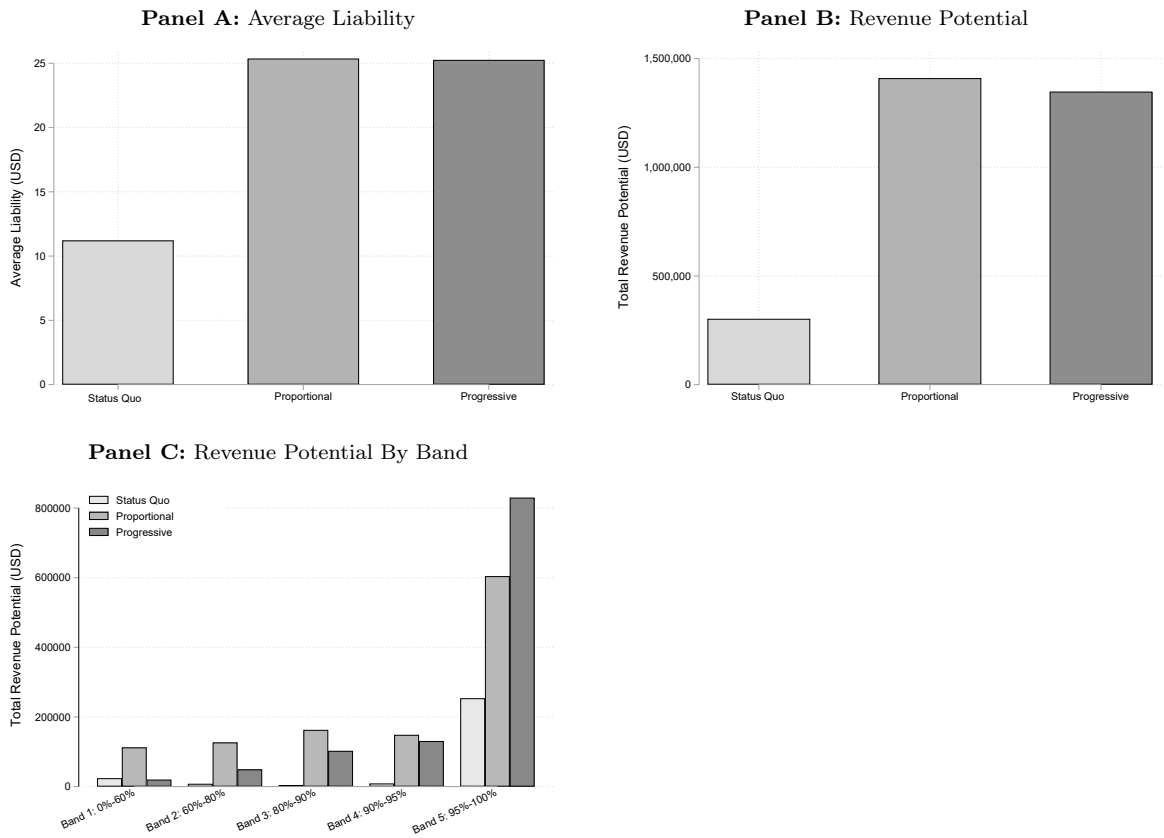
Notes: This figure illustrates that predicted building values are highly correlated with other indicators of economic wellbeing. The x-axis is predicted log building value, and the y-axis is log income, log income and expenditure, and log wealth. These wellbeing measures come from household surveys conducted with a representative sample in Kananga by independent enumerators. The wealth measure is generated by an asset-based survey module. We discuss this figure in Section 3.1.

Figure A5: Property Tax Systems in Africa



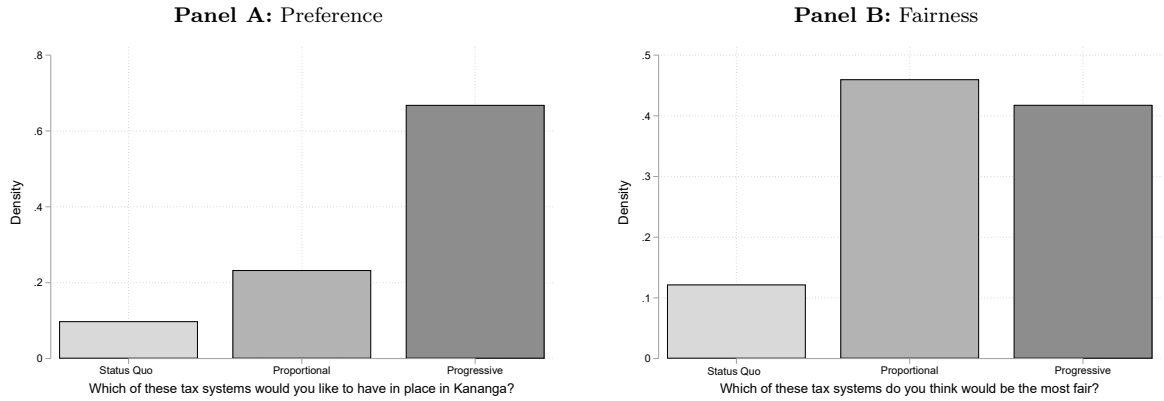
Notes: This map shows the distribution of progressive, proportional, and regressive property tax systems in Africa. When countries do not have centrally administered property tax systems, we use the tax system in place in the capital city. We discuss this figure in Section 3.2.

Figure A6: Equivalence of Average Liability and Revenue Potential in Progressive and Proportional



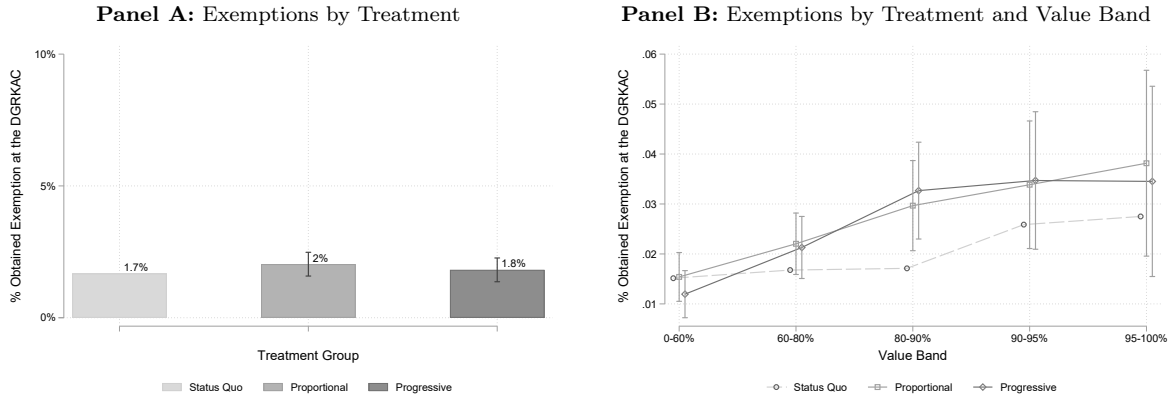
Notes: This figure summarizes the liabilities and revenue potential across the three tax systems. Panel A compares average liability across treatments. Panel B compares revenue potential (under full compliance) across treatments. Panel C compares the distribution of revenue potential (under full compliance). We discuss this figure in Section 3.2.

Figure A7: Baseline Preferences over Progressive, Proportional, and Status Quo Tax Rate Systems



Notes: This figure summarizes the preferences of a representative sample of taxpayers measured during our baseline survey (prior to the 2024 tax campaign). Respondents were shown graphs visualizing the three tax rates systems along with detailed explanations by enumerators. We discuss this figure in Section 3.2.

Figure A8: Official Exemptions by Treatment and Value Band



Notes: These figures summarize the claiming of desk-based exemptions, by treatment (Panel A) and across treatments and value bands (Panel B).

Figure A9: Example Property Tax Bill from 2024 Campaign

République Démocratique du Congo
Province du Kasaï Central
DIRECTION GENERALE DES RECETTES DU KASAI CENTRAL
DGRKAC
DIRECTION GENERALE

Identifiant de la note de perception : 110624

Au propriétaire M. [redacted]
La présente note de perception vous est signifiée pour le paiement de l'impôt foncier de la ville de Kananga pour l'année 2024.
Veuillez lire attentivement cette note de perception.

NOTE DE PERCEPTION DE L'IMPÔT FONCIER 2025

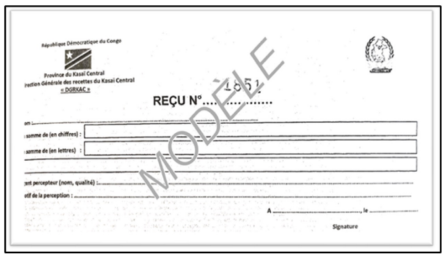
Identifiant du bâtiment :	KC000037112
Code Plus :	[redacted]
Quartier :	MALANDJI
Nom du propriétaire :	M. [redacted]
Montant à payer :	223.22 US$



Comment payer ?
Pour vous éviter de vous déplacer à la DGRKAC, nos agents circuleront dans votre quartier pendant les quatre prochaines semaines pour collecter votre paiement sur place. Ils vous donneront un reçu (voir le modèle sur cette note de perception). Vous pouvez également payer à la DGRKAC, mais les frais de transport seront à votre charge.

Quand payer ?
Les agents de la DGRKAC collecteront l'impôt foncier dans votre quartier pendant les quatre prochaines semaines. Veuillez-vous référer à la date indiquée au verso de cette note de perception.

Quelle preuve de paiement dois-je recevoir lorsque je paie mon impôt foncier ?



Des questions ?
Si vous avez des questions ou souhaitez recevoir davantage d'informations concernant l'impôt foncier, vous pouvez vous rendre au bureau des renseignements de l'impôt foncier à la DGRKAC.

Autorité de la DGRKAC

Bâtiment administratif sur l'Avenue Kinkole – Commune/Ville de Kananga, Province du Kasaï Central
République Démocratique du Congo

Notes: This figure shows an example property tax bill. The bill is addressed to the property owner, and shows the unique plus code and tax ID of the building. It also shows the total liability, along with a photo of the building and an image of a valid receipt. The information sections at the bottom explain the modalities of payment, deadlines, and where the taxpayer can find additional information. We discuss this figure in Section 3.2.

Figure A10: Example Property Tax Flier from 2024 Campaign

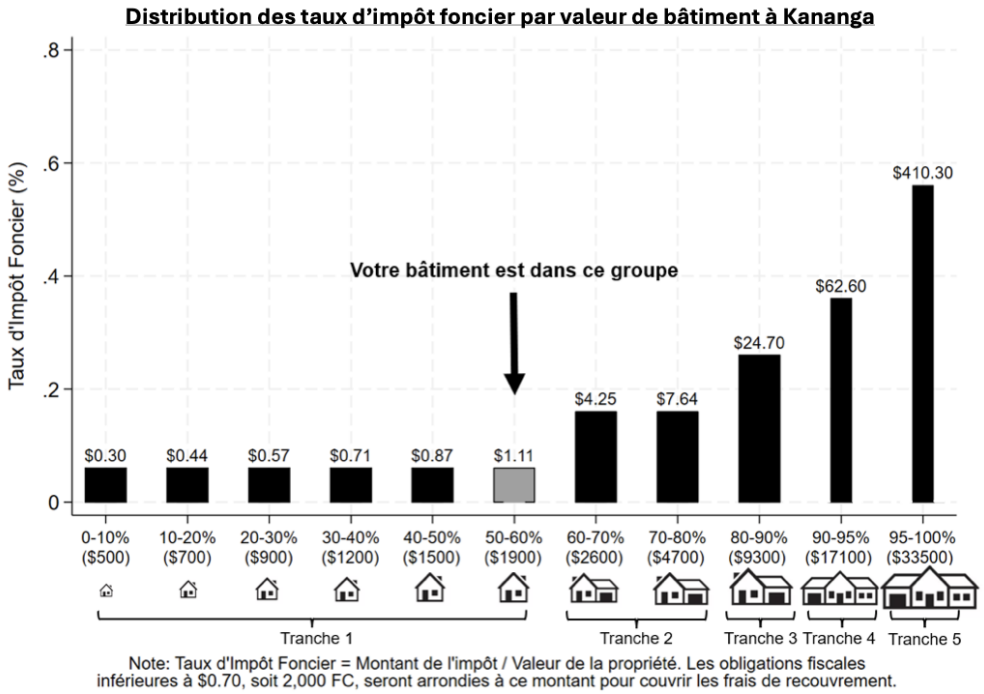
TRACT D'INFORMATION POUR L'IMPÔT FONCIER 2024

Informations générales sur l'impôt foncier :
Ce tract a pour objet de vous rappeler vos obligations en matière d'impôt foncier. La Direction Générale des Recettes du Kasaï-Central (DGRKAC) est chargée de collecter des recettes pour le gouvernement provincial du Kasaï-Central. Les recettes fiscales sont essentielles au fonctionnement du gouvernement et au développement de la province. Payez votre impôt foncier dès aujourd'hui.

Date de paiement :
Vous aurez l'occasion de payer auprès d'un percepteur qui va circuler dans votre quartier **avant le 2 novembre 2024**.

Informations sur les valeurs de bâtiment :
D'après la dernière évaluation de la DGRKAC, votre bien se situe dans la tranche 1 de la valeur des biens immobiliers à Kananga. Environ 40% des bâtiments ont une valeur supérieure au vôtre et environ 50% des bâtiments ont une valeur inférieure vôtre.

Les bâtiments situés dans votre groupe de valeur sont soumis à un impôt foncier moyen pour 2024 de $ 1.11



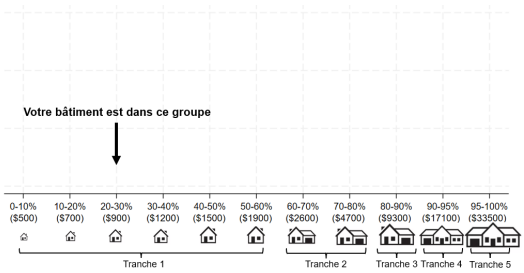
Comme vu sur le graphique ci-contre, les bâtiments de Kananga sont soumis aux taux d'imposition suivants :

- Tranche 1 : 1-60% : taux = 0.06 %, impôt moyen = $ 0.80
- Tranche 2 : 61-80% : taux = 0.16 %, impôt moyen = $ 5.91
- Tranche 3 : 80-90% : taux = 0.26 %, impôt moyen = $ 24.71
- Tranche 4 : 91-95% : taux = 0.36 %, impôt moyen = $ 62.60
- Tranche 5 : 96-100% : taux = 0.56 %, impôt moyen = $ 408.40

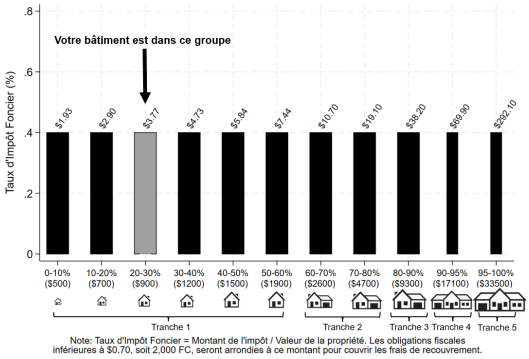
Notes: This figure shows an example property tax flier, located on the back side of the bill. All fliers began with a short informational message about the property tax. Treatment fliers then iteratively added information about the building's location in the distribution of building values in Kananga, and information about the distribution of property tax rates. This flier concerns a building in the fifth decile of property value (Band 1) in Progressive. We discuss this figure in Section 3.3.

Figure A11: Flier Image Alternatives

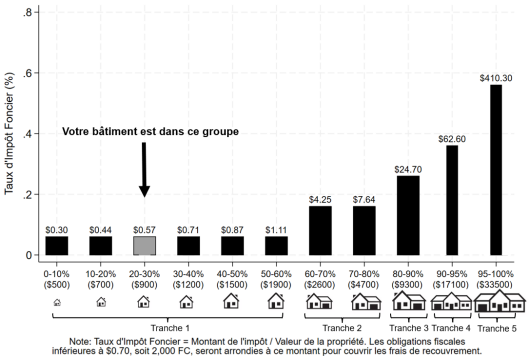
Panel A: Building Location Only



Panel B: Location + Distribution (Proportional)



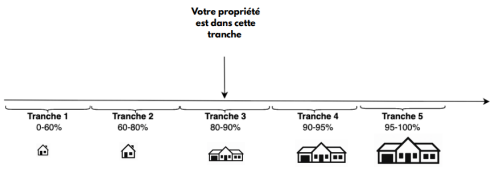
Panel C: Location + Distribution (Progressive)



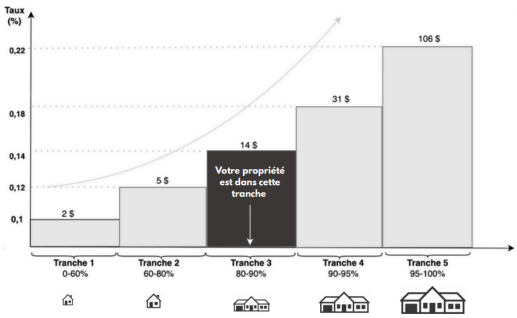
Notes: This figure shows additional visuals on fliers to complement the full flier in Figure A9. Each flier corresponds to a building in the third decile of building value. The flier in Panel A shows only the building's location in the distribution of value, while the fliers in Panels B and C show the location as well as the distribution of tax rates and liabilities in Proportional and Progressive, respectively. We discuss this figure in Section 3.3.

Figure A12: Flier Image Alternatives in 2025

Panel A: Building Location Only

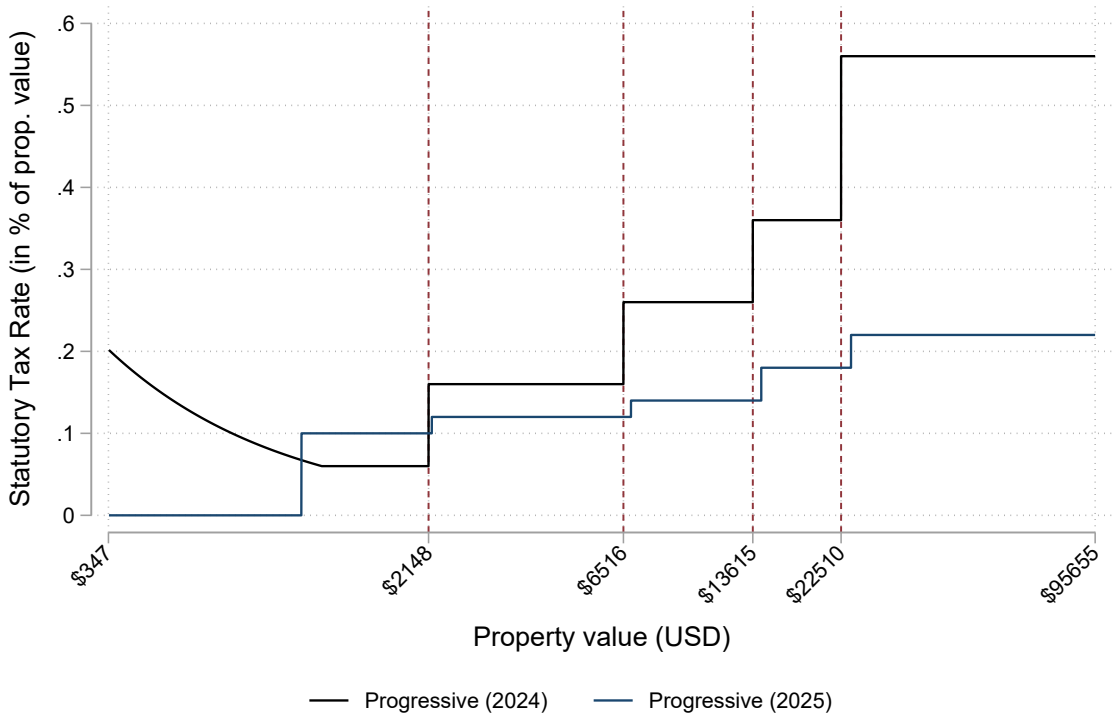


Panel B: Location + Distribution



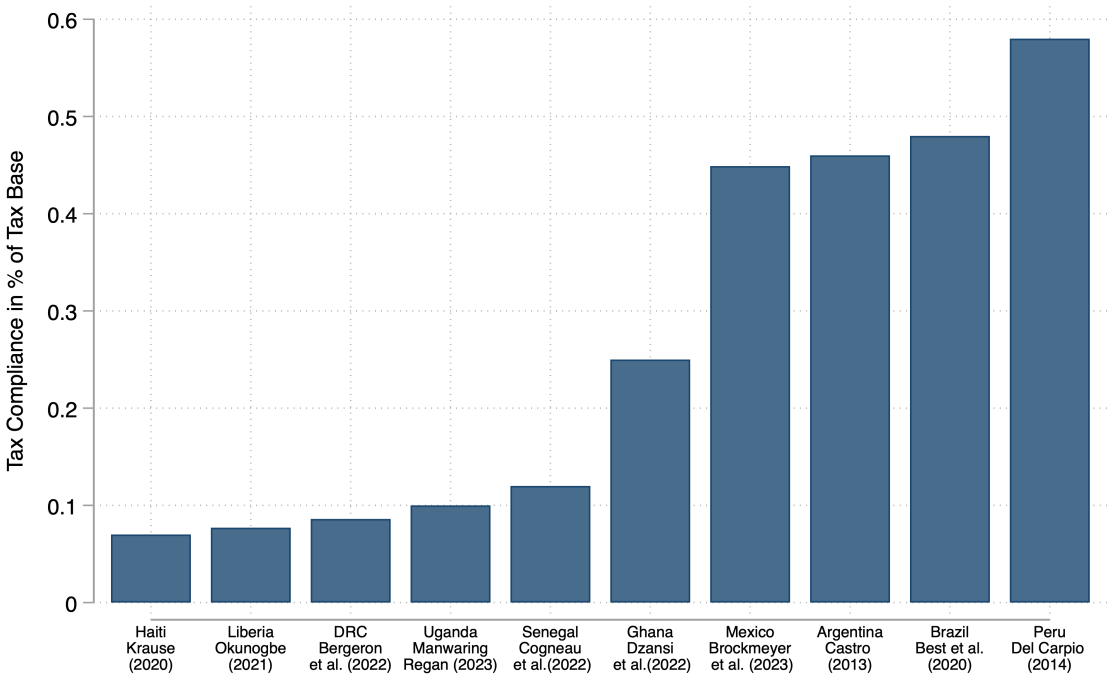
Notes: This figure shows additional visuals on fliers in the 2025 campaign. Both fliers correspond to a building in the third decile of building value. The flier in Panel A shows only the building's location in the distribution of value, while the flier in Panel B shows the location as well as the distribution of tax rates and liabilities in the 2025 campaign. We discuss this figure in Section 3.3.

Figure A13: Tax Rates in 2024 (Progressive) vs 2025



Notes: This figure visualizes the property tax rates in the progressive schedules of 2024 and 2025. We discuss this figure in Section 3.6.

Figure A14: Property Tax Compliance Across Ten Developing Countries



Notes: This figure summarizes property tax compliance rates measured using administrative data in ten recent studies. In each case, the compliance estimate reflects a large city in the country rather than the country-level average. We discuss this figure in Section 3.4.

Table A2: Balance Table

	Data Source	Observations	Control Mean	Proportional	Progressive	p-value: Prop vs Prog
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Property Characteristics						
Assessable	Admin (Assess.)	135915	0.770	0.022	0.031	0.354
Assessed Value	Admin (Assess.)	105885	8041.640	25.570	148.576	0.898
Adult Present	Admin (Assess.)	66527	0.517	-0.002	0.006	0.581
Household Income	Admin (Assess.)	31139	170062.9	4731.789	3881.639	0.917
Has Electricity	Admin (Assess.)	105566	0.221	0.012	0.010	0.822
Household Size	Admin (Assess.)	32774	7.286	-0.054	-0.094	0.634
Wall Quality	Admin (Assess.)	105566	-0.042	0.096*	0.079	0.649
Roof Quality	Admin (Assess.)	105186	0.218	0.001	0.004	0.825
Commercial Building	Admin (Assess.)	107837	0.028	-0.004	-0.004	0.873
Status Quo Tax Liability	Admin (Assess.)	105885	6.091	-0.395	-0.076	0.579
Panel B: Property Owner Characteristics						
Age	Baseline	10452	42.332	-0.581	-0.494	0.868
Gender	Baseline	10452	0.590	-0.002	0.010	0.483
Education: Any Secondary	Baseline	10452	0.844	0.012	0.012	0.991
Education: Any University	Baseline	10452	0.166	0.014	0.010	0.694
Employed	Baseline	10452	0.661	0.009	-0.004	0.260
Employed by Government	Baseline	10452	0.076	-0.003	-0.007	0.599
Believes Government Handles Tax Collection Well	Baseline	6211	0.017	-0.005	-0.053	0.165
Believes Government is Responsive to their Needs	Baseline	10287	0.012	-0.035	-0.029	0.849
Perceived Fairness of Tax System	Baseline	9773	-0.027	0.028	0.024	0.875
Predicted Tax Liability	Baseline	9778	43.025	118.880	-32.928	0.355
Perceived Fairness of Tax Amount	Baseline	9802	0.035	-0.041	-0.048	0.812
Perceived Probability of Punishment for Non-Compliance	Baseline	10452	-0.025	0.033	0.035	0.950
Perceived Amount of Public Goods from Tax Revenue	Baseline	10452	-0.028	0.009	0.056	0.362
Believes Progressive System is Fairest	Baseline	3458	0.423	0.001	-0.004	0.871
Believes Progressive System Generates Highest Revenue	Baseline	3458	0.654	0.038	0.029	0.696
Prefers Progressive System	Baseline	3458	0.659	0.022	0.023	0.945
Panel C: Tax Campaign Features						
Exempt (Field)	Admin (2024 Tax)	103815	0.122	-0.012	-0.017**	0.464
Bill Delivered	Admin (2024 Tax)	103815	0.939	-0.010	-0.013*	0.695
Installment Treatment	Randomization	66322	0.499	-0.000	-0.001	0.628
Appointment Treatment	Randomization	66322	0.500	0.000	0.000	0.920
Enforcement Treatment	Randomization	66322	0.469	0.004	0.000	0.449
Panel D: Neighborhood Characteristics						
Compliance in 2018 Tax Campaign	Admin (2018 Tax)	460	0.091	0.000	0.004	0.660
Revenue Per Owner in 2018 Tax Campaign	Admin (2018 Tax)	460	259.609	-24.775	-16.848	0.720
Tax Treatment in 2018: Central	Randomization	460	0.256	-0.013	-0.029	0.719
Tax Treatment in 2018: Local	Randomization	460	0.256	-0.023	-0.013	0.811
Tax Treatment in 2018: Central + Local Information	Randomization	460	0.159	0.027	0.011	0.685
Tax Treatment in 2018: Pure Control	Randomization	460	0.110	-0.015	0.012	0.410
Tax Treatment in 2018: None	Randomization	460	0.220	0.024	0.019	0.904
Tax Treatment in 2016	Randomization	350	0.625	0.016	-0.083	0.088*

Notes: This table assesses the balance of the neighborhood-level randomization of tax rate system treatments. Each row summarizes a separate regression of the variable shown on treatment dummies according to Equation 2. Panel A includes property characteristics from the administrative data used for mass assessment. Panel B includes property owner characteristics drawn from the baseline survey. Panel C includes features of the 2024 tax campaign, which come from either the admin data or our randomization files. Panel D includes neighborhood characteristics from 2018 administrative tax data or 2018 and 2016 randomization files. The number of observations varies by characteristic based on respondent availability and non-response during the assessment survey and the baseline survey. We discuss this figure in Section 4.2.

A3 Additional Exhibits — Results

Table A3: Robustness — Reassigned Properties

	Compliance				Revenue			
	(1) ITT	(2) Recoding Reassigned Properties	(3) Dropping Reassigned Properties	(4) Instrumenting Proportional Treatment with Assignment	(5) ITT	(6) Recoding Reassigned Properties	(7) Dropping Reassigned Properties	(8) Instrumenting Proportional Treatment with Assignment
Panel A: Proportional vs Progressive								
Progressive	0.072***	0.072***			175.154**	162.804**		
	(0.006)	(0.006)			(78.026)	(81.609)		
Observations	77698	78194			77698	78194		
Control Mean	0.014	0.014			311.903	335.383		
Panel B: Status Quo Rate vs Proportional and Progressive								
Proportional	-0.013***	-0.013***	-0.013***	-0.014***	18.238	50.749	42.805	18.732
	(0.003)	(0.003)	(0.003)	(0.003)	(46.991)	(45.749)	(43.333)	(48.168)
Progressive	0.058***	0.058***	0.058***	0.058***	195.960**	212.861***	218.678***	196.449**
	(0.006)	(0.006)	(0.006)	(0.006)	(80.036)	(74.987)	(74.045)	(80.334)
Observations	96295	96252	95756	96295	96295	96252	95756	96295
Control Mean	0.027	0.027	0.027	0.027	312.831	280.762	275.044	278.230

Notes: This table shows the robustness of our results on compliance and revenue to different approaches to handling the reassignment of 496 high-value properties from the status quo group to the proportional group. Columns 1 and 5 show the ITT (our main specification), Columns 2 and 6 recode the treatment status of the reassigned properties, Columns 3 and 7 drops the reassigned properties, and Columns 4 and 8 instrument proportional treatment with assignment to the proportional group. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this table in Section 4.2.

Table A4: Robustness — Treatment Effects on Compliance

	(1) Main Specification	(2) Dropping Exempt Properties	(3) Including Failed Bill Deliveries	(4) Including Commercial Buildings	(5) Controlling for Imbalanced Covariates	(6) Compound Level	(7) Removing Owners of Multiple Buildings	(8) Removing Enforcement Payments	(9) Controlling for Other Treatments
Panel A: Proportional vs Progressive									
Progressive	0.072***	0.074***	0.067***	0.071***	0.069***	0.089***	0.072***	0.066***	0.056***
	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)	(0.007)	(0.006)	(0.006)	(0.006)
Observations	77700	68725	83792	79594	74817	50855	77672	77347	77524
Control Mean	0.014	0.015	0.013	0.014	0.013	0.018	0.014	0.013	0.014
Panel B: Status Quo vs Proportional and Progressive									
Proportional	-0.014***	-0.012***	-0.014***	-0.014***	-0.012***	-0.016***	-0.014***	-0.014***	-0.010***
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.004)
Progressive	0.058***	0.062***	0.052***	0.056***	0.056***	0.074***	0.058***	0.053***	0.046***
	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)
Observations	96142	84791	103429	97741	92078	62759	96107	95737	95914
Control Mean	0.027	0.026	0.026	0.027	0.025	0.033	0.027	0.027	0.027

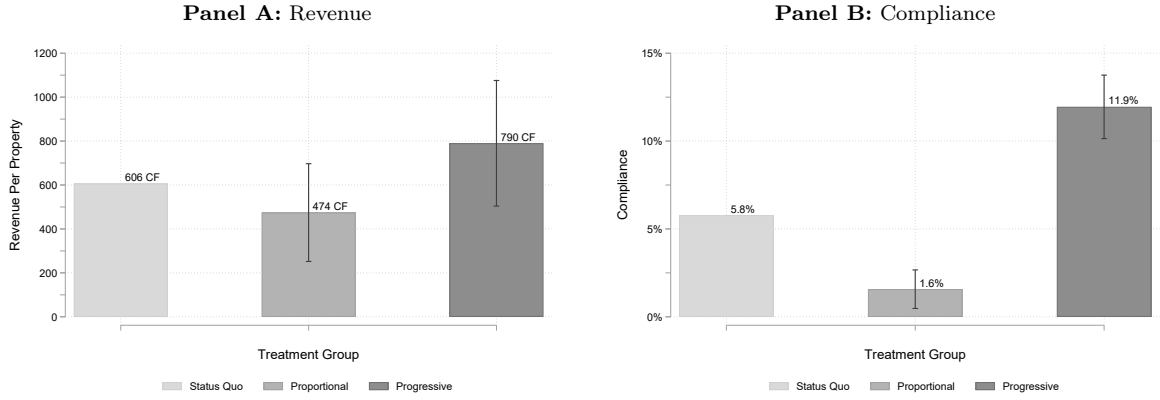
Notes: This table shows the robustness of our results on compliance to a number of checks. Column 1 shows our main specification. Column 2 drops exempted properties. Column 3 includes properties that did not receive a bill. Column 4 includes commercial buildings. Column 5 controls for imbalanced covariates as found in Appendix Table A2. Column 6 estimates results at the compound level rather than the building level. Column 7 drops owners of multiple buildings, who might receive more than one treatment. Column 8 drops payments collected by the enforcement team. Column 9 flexibly controls for other cross-randomized treatments. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this table in Section 5.2.

Table A5: Robustness — Treatment Effects on Revenue

	(1) Main Specification	(2) Dropping Exempt Properties	(3) Including Failed Bill Deliveries	(4) Including Commercial Buildings	(5) Controlling for Imbalanced Covariates	(6) Compound Level	(7) Removing Owners of Multiple Buildings	(8) Removing Enforcement Payments	(9) ln(1+Revenue) as the Outcome	(10) Controlling for Other Treatments
Panel A: Proportional vs Progressive										
Progressive	175.307**	184.339**	155.778**	142.200*	162.854**	283.698**	175.158**	163.271**	0.546***	325.729***
	(78.055)	(89.283)	(70.279)	(78.600)	(78.952)	(123.993)	(78.040)	(78.474)	(0.045)	(125.368)
Observations	77700	68725	83792	79119	74817	50855	77672	77347	77700	77524
Control Mean	312.400	328.695	290.224	340.521	302.501	473.871	312.535	307.636	0.130	312.400
Panel B: Status Quo vs Proportional and Progressive										
Proportional	2.765	40.390	-16.907	30.735	19.434	-3.802	3.025	1.616	-3.482***	-72.381
	(43.428)	(48.645)	(41.681)	(46.508)	(45.933)	(68.477)	(43.428)	(43.592)	(0.337)	(63.000)
Progressive	177.781**	225.095**	138.761*	173.169**	182.753**	279.330**	177.898**	164.786**	-2.940***	253.372**
	(77.815)	(89.056)	(70.981)	(76.222)	(80.152)	(123.014)	(77.835)	(78.396)	(0.339)	(118.227)
Observations	96297	84910	103589	97939	92202	62820	96262	95892	95153	96067
Control Mean	330.493	312.826	328.245	331.272	311.486	513.602	330.405	326.768	3.610	330.493

Notes: This table shows the robustness of our results on revenue to a number of checks. Column 1 shows our main specification. Column 2 drops exempted properties. Column 3 includes properties that did not receive a bill. Column 4 includes commercial buildings. Column 5 controls for imbalanced covariates as found in Appendix Table A2. Column 6 estimates results at the compound level rather than the building level. Column 7 drops owners of multiple buildings, who might receive more than one treatment. Column 8 drops payments collected by the enforcement team. Column 9 studies log revenue as the outcome. Column 10 flexibly controls for other cross-randomized treatments. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this table in Section 5.2.

Figure A15: Treatment Effects on Tax Revenue and Compliance: No Status Quo Adjustment



Notes: This figure shows the average revenue raised per property by treatment group without adjusting for lower average tax liabilities in Status Quo, as described in Section A4.1. The analogous figure with the adjustment is Figure 2. The sample includes all assessable residential buildings that received a tax bill in the 2024 property tax campaign. Other details about the estimation can be found in Section 5.1. We discuss this figure in Section 5.2.

Table A6: Assessing Endogenous Collector Effort: Treatment Effects on Visits

	All Bands Pooled	Value Band 0-60%	60-80%	80-90%	90-95%	95-100%
Panel A: Any Visit						
Progressive	-0.014	-0.016	-0.006	0.005	-0.022	0.009
	(0.011)	(0.013)	(0.015)	(0.018)	(0.018)	(0.027)
Observations	77700	46752	15609	7831	3873	3635
Control Mean	0.638	0.571	0.690	0.745	0.823	0.844
Panel B: Number of Visits						
Progressive	0.000	0.012	-0.013	0.006	-0.042	0.029
	(0.024)	(0.027)	(0.033)	(0.040)	(0.044)	(0.059)
Observations	77700	46752	15609	7831	3873	3635
Control Mean	0.880	0.780	0.982	1.046	1.120	1.106
Panel C: Average Duration of Visit (Minutes)						
Progressive	1.283	1.663	0.637	1.250	0.638	1.229
	(0.994)	(1.142)	(1.078)	(1.704)	(1.417)	(1.874)
Observations	48679	26064	10615	5811	3130	3059
Control Mean	5.656	5.567	5.546	5.842	6.184	5.900

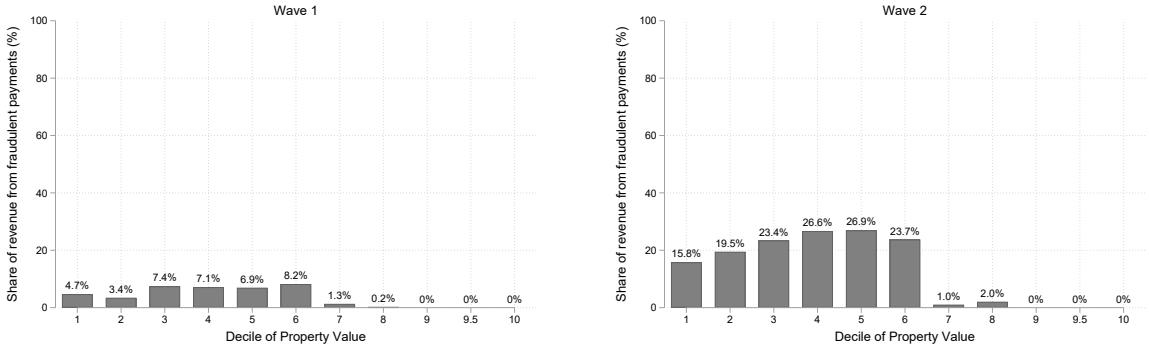
Notes: This table shows treatment effects of Progressive on visits across value bands (compared to Proportional). In Panel A, the outcome is a binary variable for receiving at least one visits. In Panel B, the outcome is the number of visits received. In Panel C, the outcome is the average duration of each visit. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this table in Section 5.6.

Table A7: Robustness — Treatment Effects on Compliance and Revenue: Controlling for Number and Duration of Visits

	Compliance			Revenue		
	(1) Controlling for Any Visit	(2) Controlling for Nb. of Visits	(3) Controlling for Visit Duration	(4) Controlling for Any Visit	(5) Controlling for Nb. of Visits	(6) Controlling for Visit Duration
Panel A: Proportional vs Progressive						
Progressive	0.072***	0.072***	0.083***	180.307**	175.163**	240.805*
	(0.006)	(0.006)	(0.007)	(78.705)	(77.744)	(123.618)
Observations	77700	77700	48679	77700	77700	48679
Control Mean	0.014	0.014	0.014	312.400	312.400	312.400
Panel B: Status Quo vs Proportional and Progressive						
Proportional	-0.014***	-0.015***	-0.014***	-7.270	-6.509	45.972
	(0.003)	(0.003)	(0.004)	(43.125)	(43.266)	(66.043)
Progressive	0.058***	0.057***	0.070***	172.629**	168.589**	287.392**
	(0.006)	(0.006)	(0.007)	(77.204)	(76.563)	(123.636)
Observations	96142	96142	59711	96297	96297	59849
Control Mean	0.027	0.027	0.027	330.493	330.493	330.493

Notes: This table shows the robustness of our results on compliance and revenue to controlling for the duration and number of visits. Columns 1 and 4 control for receiving any visit. Columns 2 and 5 control for the number of visits received. Columns 3 and 6 control for the average duration of visits. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this table in Section 5.6.

Figure A16: Share of Revenue from Fraudulent Payments, by Wave and Decile of Property Value



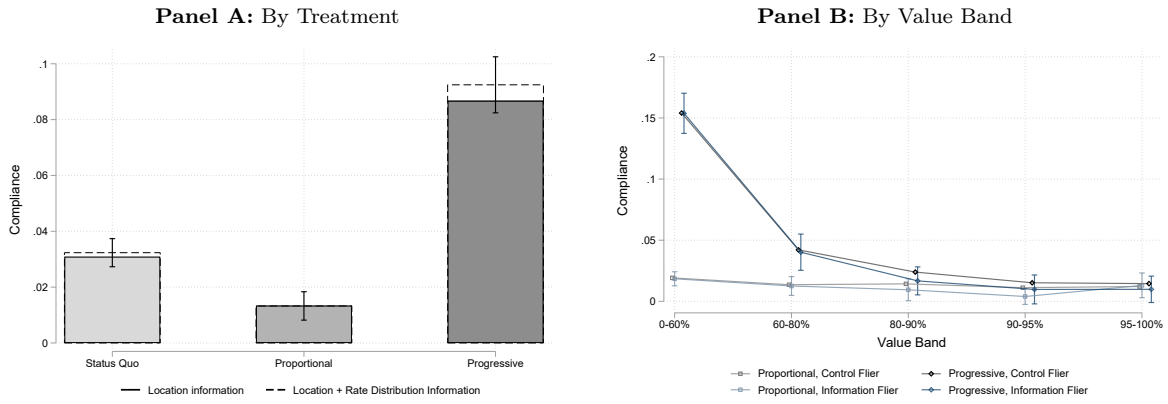
Notes: This figure shows the share of revenue from fraudulent payments discovered during the audit of all recorded payments described in Section 5.6, by wave of tax collection and decile of property value.

Table A8: Robustness — Treatment Effects on Compliance and Revenue: Randomly Assigned Facilitation Appointments

		Compliance			ln(1+Revenue)		
	(1) Random Appt Met	(2) Conditioning on Assignment to Random Appt	(3) Conditioning on Random Appt Met	(4) Heterogeneity by Random Appt	(5) Conditioning on Assignment to Random Appt	(6) Conditioning on Random Appt Met	(7) Heterogeneity by Random Appt
Panel A: Proportional vs Progressive							
Progressive	-0.006	0.074***	0.074***	0.071***	0.564***	0.564***	0.537***
	(0.017)	(0.006)	(0.007)	(0.006)	(0.049)	(0.052)	(0.047)
Progressive x Random Appt				0.004			0.029
				(0.004)			(0.033)
Random Appt				-0.000			0.003
				(0.001)			(0.014)
Observations	24162	25332	20779	77700	25332	20779	77700
Control Mean	0.863	0.014	0.014	0.014	0.137	0.129	312.400
Panel B: Status Quo vs Proportional and Progressive							
Proportional	0.014	-0.018***	-0.019***	-0.012***	-0.360***	-0.380***	-0.256***
	(0.024)	(0.003)	(0.003)	(0.003)	(0.049)	(0.051)	(0.040)
Proportional x Random Appt				-0.006**			-0.104***
				(0.002)			(0.031)
Progressive	0.008	0.057***	0.055***	0.059***	0.204***	0.182***	0.278***
	(0.025)	(0.007)	(0.007)	(0.006)	(0.065)	(0.068)	(0.059)
Progressive x Random Appt				-0.002			-0.074*
				(0.004)			(0.042)
Random Appt				0.006***			0.107***
				(0.002)			(0.028)
Observations	29812	31243	25500	96142	31317	25562	96297
Control Mean	0.847	0.031	0.032	0.027	0.491	0.506	0.418

Notes: This table presents results on the share of random appointments honored by treatment status, and shows the robustness of our results on compliance and revenue to assignment to random appointments. Column 1 shows the effect of treatment on random appointments being honored. Columns 2 and 5 present treatment effects conditional on being assigned to random appointments. Columns 3 and 6 present treatment effects conditional on being assigned to random appointments and the appointment being honored. Columns 4 and 7 test for heterogeneity in treatment effects by assignment to random appointments. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this table in Section 5.6.

Figure A17: Treatment Effects of Tax System Information on Compliance



Notes: This figure summarizes the effect of providing information about the tax rate system on compliance. Panel A shows results by treatment, while Panel B further disaggregates by value band. The control group receives only a short message about the property tax, while the treatment group receives information about their location in the distribution of building values and the schedule of tax rates in their neighborhood. We discuss this figure in Section 6.

Table A9: Robustness — Alternative Fraud Adjustments

	Compliance					Revenue				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Proportional vs Progressive										
Progressive	0.089***	0.113***	0.117***	0.072***	0.086***	266.463**	339.728***	462.882**	253.733	254.311*
	(0.007)	(0.009)	(0.008)	(0.007)	(0.007)	(129.707)	(130.593)	(185.212)	(166.877)	(129.454)
Observations	51235	51235	51235	39993	51235	51235	51235	51235	39993	51235
Control Mean	0.018	0.019	0.019	0.018	0.018	509.867	513.208	513.208	544.186	511.917
Panel B: Status Quo vs Proportional and Progressive										
Proportional	-0.014***	-0.011***	-0.014**	-0.008**	-0.011***	68.148	-2.179	-71.267	-4.227	-2.977
	(0.003)	(0.003)	(0.006)	(0.004)	(0.003)	(72.761)	(70.730)	(103.502)	(90.002)	(70.598)
Progressive	0.075***	0.102***	0.100***	0.064***	0.075***	332.565***	335.364***	358.903*	247.994	248.901**
	(0.007)	(0.009)	(0.008)	(0.007)	(0.007)	(117.568)	(117.131)	(184.315)	(152.189)	(116.085)
Observations	62795	62795	62795	48731	62795	62795	62795	62795	48731	62795
Control Mean	0.032	0.030	0.030	0.028	0.030	436.495	510.308	510.308	550.222	510.094
Fraud Adjustment	Yes	No	No	No	No	Yes	No	No	No	No
Excluding Wave 2 Band 1	No	No	No	Yes	No	No	No	No	Yes	No
Recoding fraud as no compliance	No	No	No	No	Yes	No	No	No	No	Yes
Wave FEs	No	No	Yes	No	No	No	No	Yes	No	No
Collector FEs	No	No	Yes	No	No	No	No	Yes	No	No

Notes: This table shows the robustness of our results on compliance and revenue to collector fraud. Columns 1 and 6 show our main specification, in which we drop properties likely exposed to fraud uniformly by treatment (as discussed in Section 3.5). Columns 2 and 7 show results with no fraud adjustment. Columns 3 and 8 introduce tax campaign wave fixed effects and tax collector fixed effects, given that opportunities for fraud varied by wave and collector. Columns 4 and 9 drop Band 1 properties in wave 2 entirely, as this was the wave most affected by fraud and essentially all opportunities for fraud occurred in Band 1. Columns 5 and 10 recode fraud as no compliance. Panel A summarizes results from estimating Equation 2, comparing Progressive and Proportional, while Panel B includes the comparison to the Status Quo. The sample includes all assessable residential buildings that received a tax bill in the 2024 property tax campaign. Regressions in Panel B include a rate adjustment for the Status Quo group. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this figure in Section 5.6.

Table A10: Spillovers — Awareness of Others' Rates

		Topic of Discussion					
	Discussed Taxes with People from Other Neighborhoods	Tax Liability Calculation	Property Valuation Approach	Tax Campaign Sensitization	Tax Collectors	Tax Campaign Timing	Tax Campaign Payment Modes
Panel A: Proportional vs Progressive							
Progressive	0.000	-0.004	-0.000	0.003	-0.004	-0.001	0.001
	(0.008)	(0.006)	(0.005)	(0.003)	(0.003)	(0.003)	(0.004)
Observations	22450	22450	22450	22450	22450	22450	22450
Control Mean	0.176	0.051	0.072	0.037	0.020	0.013	0.028
Panel B: Status Quo vs Proportional and Progressive							
Proportional	0.004	0.016***	0.008	-0.016***	0.000	0.003	0.001
	(0.009)	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)	(0.005)
Progressive	0.005	0.013**	0.007	-0.013**	-0.003	0.002	0.003
	(0.009)	(0.006)	(0.006)	(0.005)	(0.004)	(0.004)	(0.005)
Observations	27335	27335	27335	27335	27335	27335	27335
Control Mean	0.173	0.035	0.065	0.053	0.020	0.010	0.027

Notes: This table shows treatment effects on self-reported discussions about taxes with people from other neighborhoods, recorded in the midline survey. The outcome in Column 1 is a dummy for ever discussing taxes with people from other neighborhoods. The next six columns then disaggregate the reported topic(s) of the conversation. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this figure in Section 5.6.

Table A11: Spillovers — Main Results Controlling for Awareness of Others' Rates

	Compliance			ln(1 + Revenue)		
	(1)	(2)	(3)	(4)	(5)	(6)
Progressive	0.064***	0.064***	0.059***	0.495***	0.495***	0.461***
	(0.005)	(0.005)	(0.005)	(0.043)	(0.043)	(0.041)
Discussed Taxes with People from Other Neighborhoods		0.025***	0.012***		0.216***	0.119***
		(0.005)	(0.003)		(0.040)	(0.034)
Progressive x Discussed Taxes with People from Other Neighborhoods			0.025***			0.193**
			(0.009)			(0.079)
Observations	21436	21436	21436	21436	21436	21436
Control Mean	0.013	0.013	0.013	0.127	0.127	0.127

Notes: This table shows heterogeneous treatment effects on compliance and revenue by reported tax discussions with people in other neighborhoods. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this figure in Section 5.6.

Table A12: Spillovers — Compliance Effects Controlling for Non-Progressive Adjacent Neighborhoods

	All Bands Pooled	Value Band 0-60%	60-80%	80-90%	90-95%	95-100%
Panel A: Controlling for Share of Adjacent Status Quo Neighborhoods						
Progressive	0.072***	0.108***	0.026***	0.006**	0.003	-0.002
	(0.006)	(0.008)	(0.003)	(0.003)	(0.002)	(0.002)
Share of Adjacent Status Quo Neighborhoods	0.012	0.012	0.020*	-0.004	0.007	0.007
	(0.021)	(0.028)	(0.012)	(0.010)	(0.009)	(0.010)
Observations	77700	46752	15609	7831	3873	3635
Control Mean	0.014	0.017	0.010	0.009	0.005	0.005
Panel B: Controlling for Share of Adjacent Proportional Neighborhoods						
Progressive	0.072***	0.108***	0.027***	0.006**	0.003	-0.002
	(0.006)	(0.008)	(0.003)	(0.003)	(0.002)	(0.002)
Share of Adjacent Proportional Neighborhoods	-0.008	-0.008	-0.013	-0.007	-0.001	-0.008
	(0.014)	(0.020)	(0.008)	(0.006)	(0.006)	(0.005)
Observations	77700	46752	15609	7831	3873	3635
Control Mean	0.014	0.017	0.010	0.009	0.005	0.005

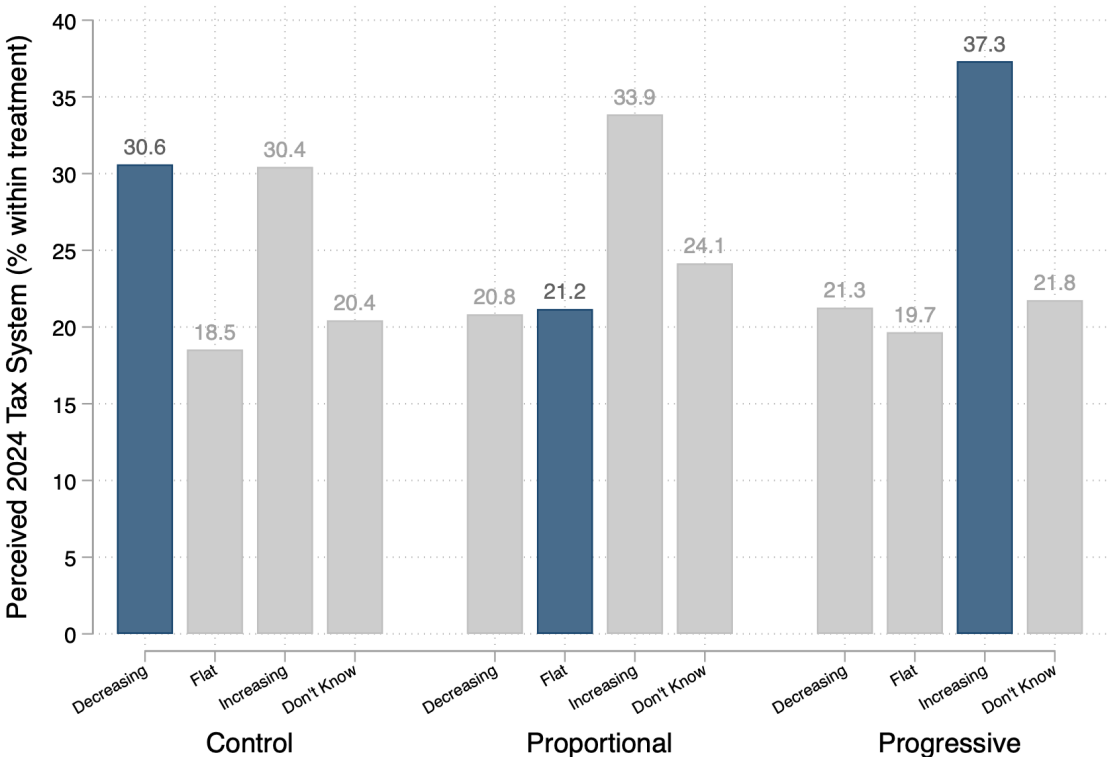
Notes: This table examines spillovers on compliance by exploiting the cluster random assignment of tax systems, following Miguel and Kremer (2004). Specifically, we examine whether exogenously being assigned to a larger share of adjacent neighborhoods in Status Quo or Proportional impacts compliance. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this figure in Section 5.6.

Table A13: Heterogeneous Treatment Effects on Compliance by Baseline Preferences Over Tax Rate Systems

	Proportional vs Progressive		Status Quo vs Proportional and Progressive	
	(1)	(2)	(3)	(4)
Progressive	0.066***	0.082***	0.072***	0.078***
	(0.018)	(0.013)	(0.017)	(0.013)
Progressive x Prefers Progressive	0.025		0.008	
	(0.020)		(0.021)	
Prefers Progressive	-0.009		-0.008	
	(0.009)		(0.010)	
Progressive x Progressive Most Fair		0.005		0.001
		(0.020)		(0.022)
Progressive Most Fair		-0.008		-0.010
		(0.006)		(0.011)
Proportional			-0.012*	-0.004
			(0.007)	(0.009)
Proportional x Prefers Proportional			0.026*	
			(0.015)	
Prefers Proportional			-0.024	
			(0.017)	
Proportional x Proportional Most Fair				-0.003
				(0.014)
Proportional Most Fair				-0.007
				(0.016)
Observations	2719	2698	3310	3284
Control Mean	0.014	0.014	0.027	0.027

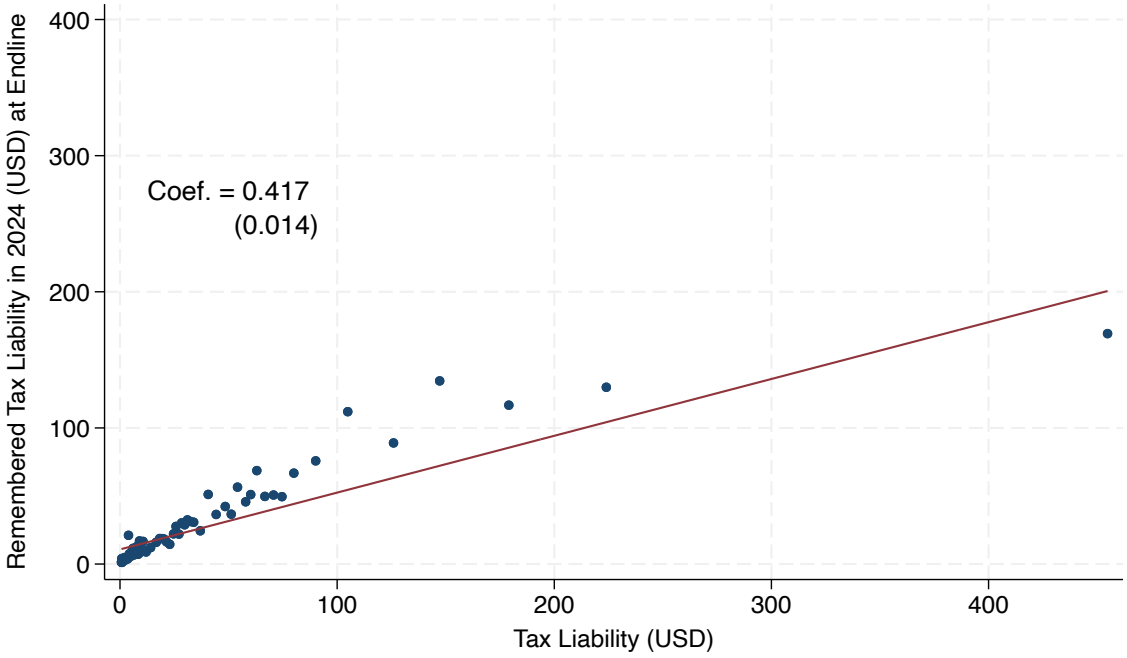
Notes: This table examines heterogeneous treatment effects on compliance by baseline preferences over tax rate systems. *Prefers Progressive* is a dummy for baseline respondents who indicated that they would choose Progressive of the three possible systems. *Progressive Most Fair* is a dummy for respondents who said Progressive was the fairest of the three tax systems. Both variables are constructed analogously for Proportional. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels. We discuss this figure in Section 6.

Figure A18: Actual v. Perceived Tax Schedule in 2024



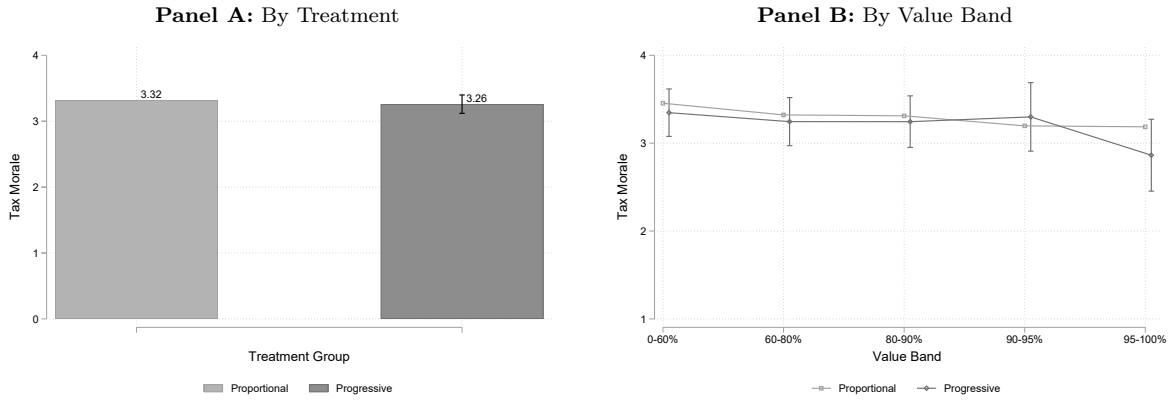
Notes: This figure compares taxpayers' perceptions of their 2024 tax system with the actual randomly assigned system. It uses data from the midline survey. We discuss this figure in Section 6.

Figure A19: Actual v. Perceived Tax Liabilities in 2024



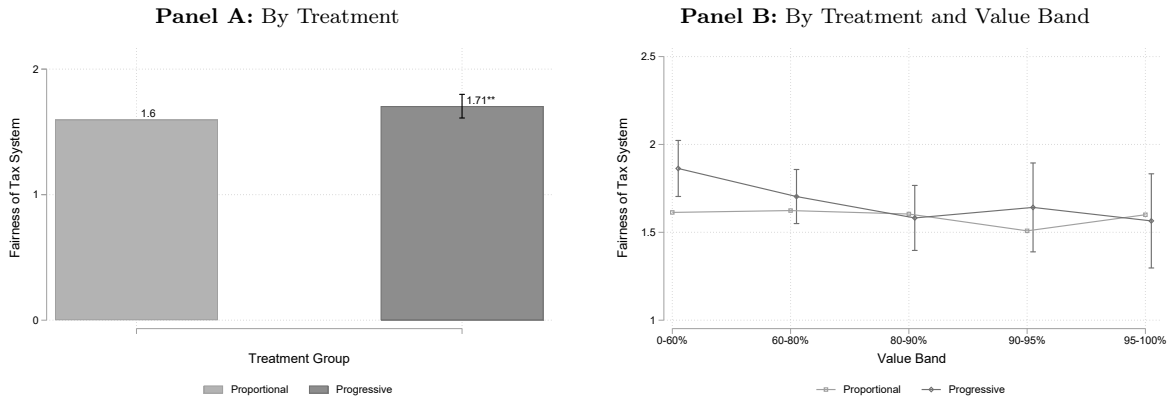
Notes: This figure compares taxpayers' perceptions of their 2024 tax liability with their actual 2024 tax liability. It uses data from the endline survey. We discuss this figure in Section 6.

Figure A20: Tax Morale by Tax System Treatment and Value Band



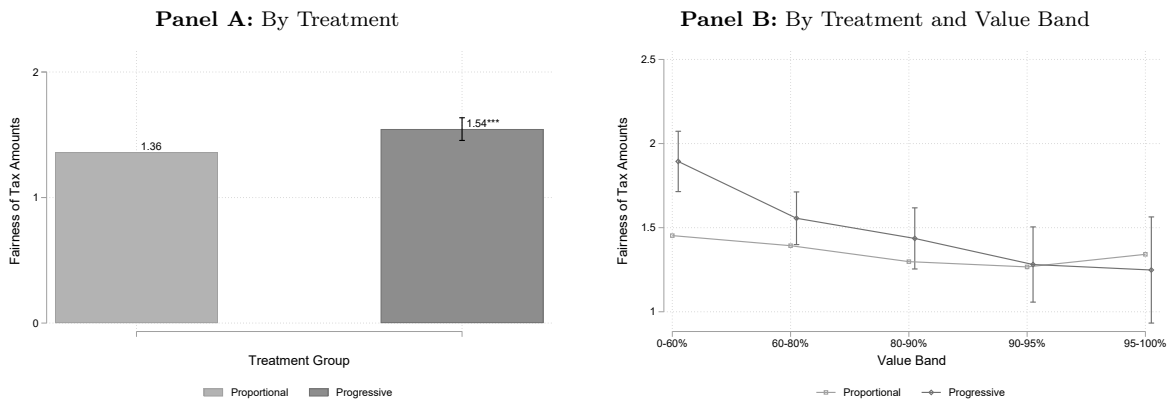
Notes: This figure summarizes the effect of tax rate treatments on endline tax morale. Panel A shows results by treatment, while Panel B further disaggregates by value band. We discuss this figure in Section 6.

Figure A21: Perceived Fairness of Tax System by Tax System Treatment and Value Band



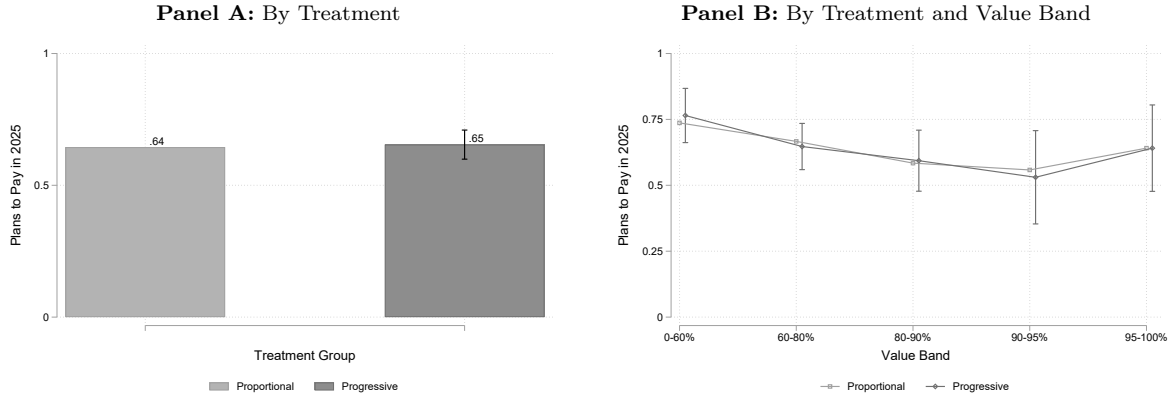
Notes: This figure summarizes the effect of tax rate treatments on the perceived fairness of the tax system, measured at endline. Panel A shows results by tax system treatment, while Panel B further disaggregates by value band. The sample only includes respondents in the control group for the information experiment: the result thus reflect only the 2024 tax system variation (rather than the endline information treatments). We discuss this figure in Section 6.

Figure A22: Perceived Fairness of Tax Liability by Tax System Treatment and Value Band



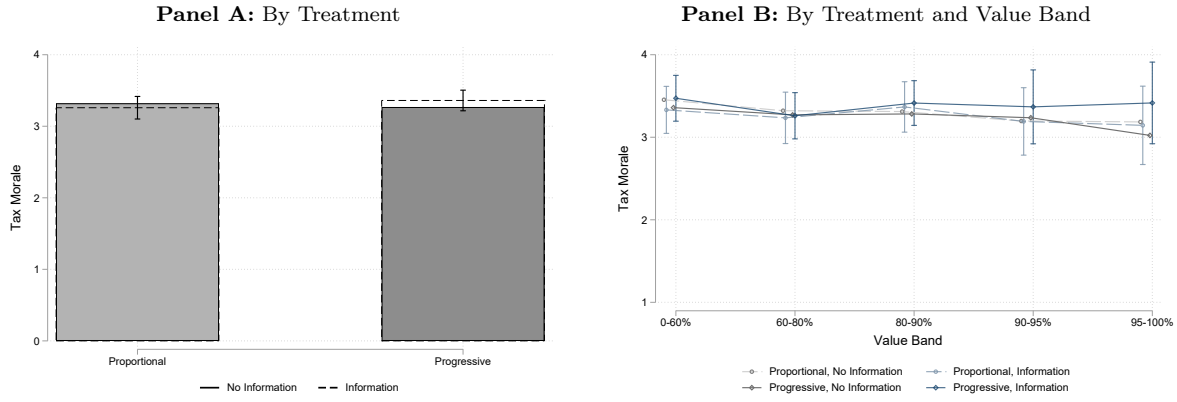
Notes: This figure summarizes the effect of tax rate treatments on the perceived fairness of the tax liability, measured at endline. Panel A shows results by treatment, while Panel B further disaggregates by value band. The sample only includes respondents in the control group for the information experiment: the result reflect only the 2024 tax system variation (rather than the endline information treatments). We discuss this figure in Section 6.

Figure A23: Intent to Pay the Property Tax in 2025 by Tax System Treatment and Value Band



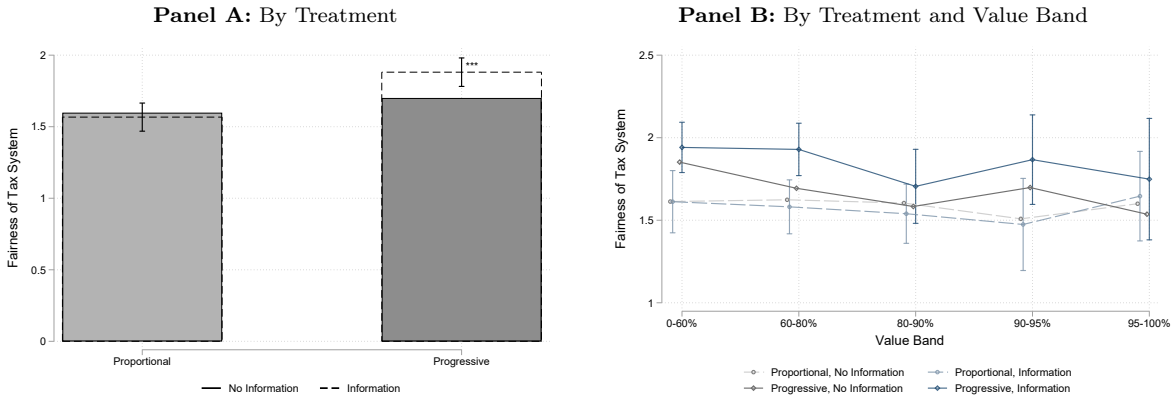
Notes: This figure summarizes the effect of tax rate treatments on self-reported intention to pay the property tax in 2025, measured at endline. Panel A shows results by treatment, while Panel B further disaggregates by value band. The sample only includes respondents in the control group for the information experiment: the results reflect only the 2024 tax system variation (rather than the endline information treatments). We discuss this figure in Section 6.

Figure A24: Endline Information Experiment — Tax Morale



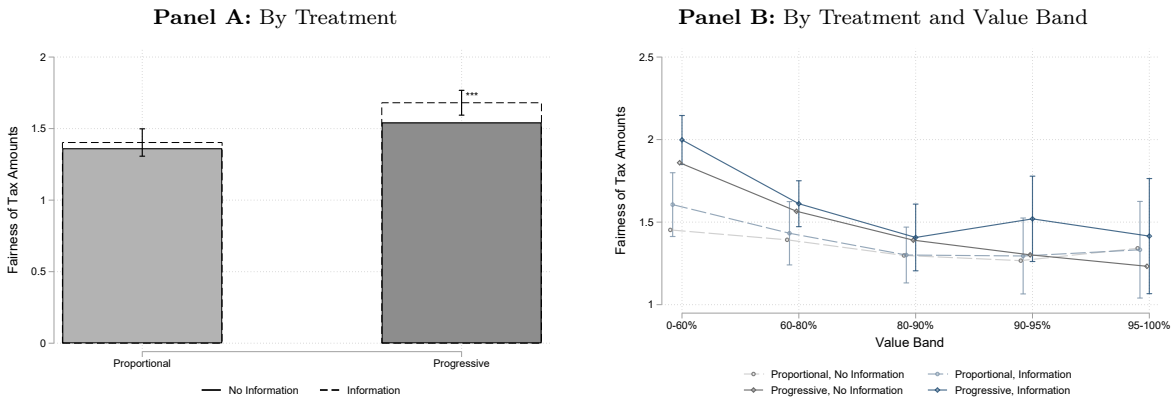
Notes: This figure summarizes the results of the endline information experiment on endline tax morale. Panel A shows the average tax morale by treatment comparing taxpayers who received information about the tax system (dashed line) or not (filled bar). Panel B compares the treatment effect of information for Progressive and Proportional across value bands. We discuss this figure in Section 6.

Figure A25: Endline Information Experiment — Perceived Fairness of Tax System



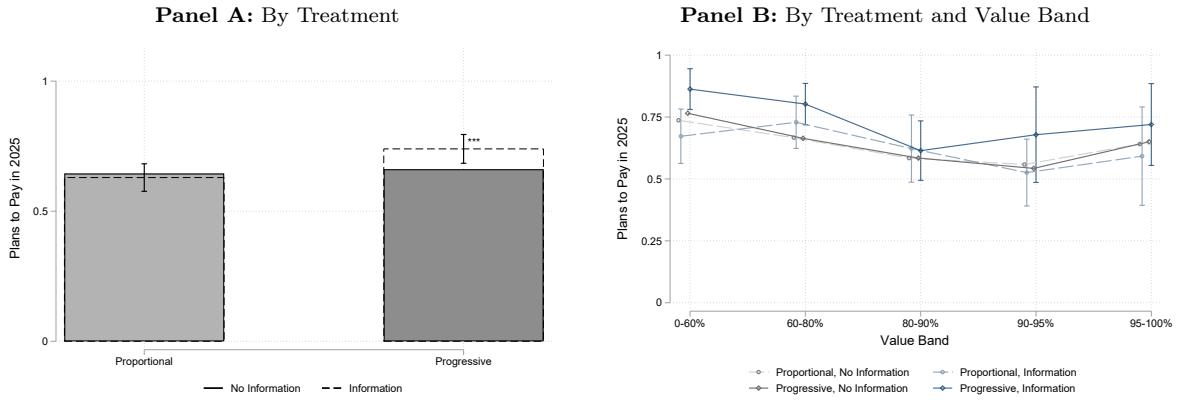
Notes: This figure summarizes the results of the endline information experiment on the perceived fairness of the tax system. Panel A shows the average perceived fairness of the tax system by treatment comparing taxpayers who received information about the tax system (dashed line) or not (filled bar). Panel B compares the treatment effect of information for Progressive and Proportional across value bands. We discuss this figure in Section 6.

Figure A26: Endline Information Experiment — Perceived Fairness of Tax Liability



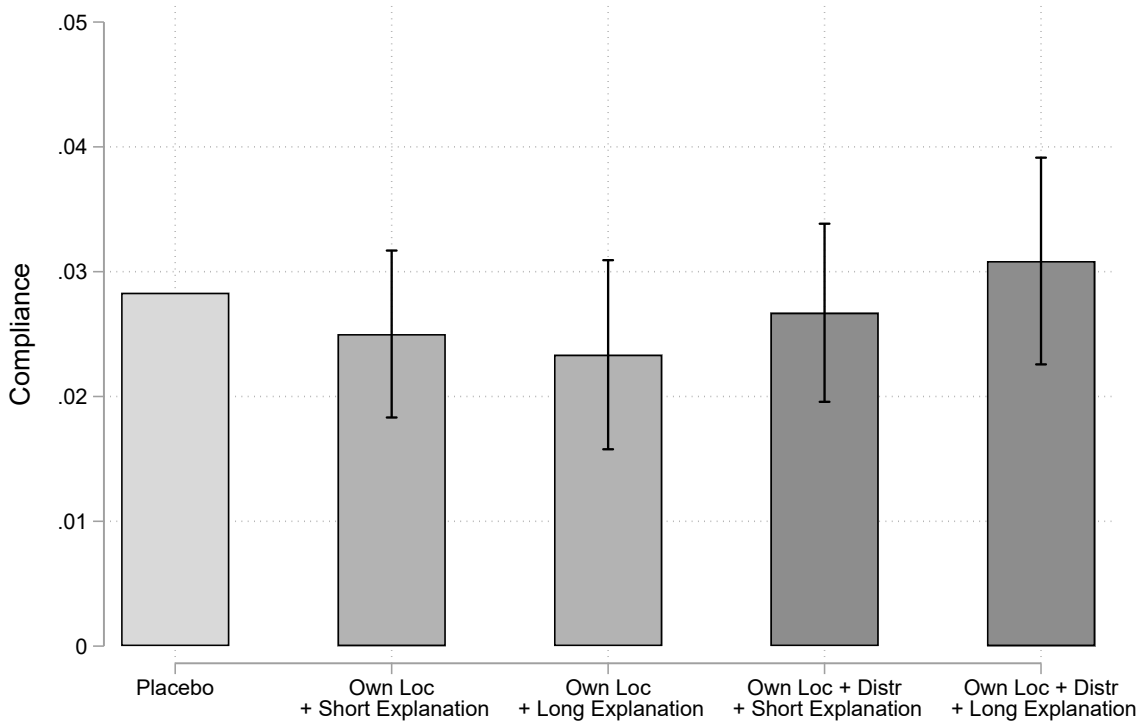
Notes: This figure summarizes the results of the endline information experiment on the perceived fairness of the tax liability. Panel A shows the average perceived fairness of the tax liability by treatment comparing taxpayers who received information about the tax system (dashed line) or not (filled bar). Panel B compares the treatment effect of information for Progressive and Proportional across value bands. We discuss this figure in Section 6.

Figure A27: Endline Information Experiment — Intent to Pay the Property Tax in 2025



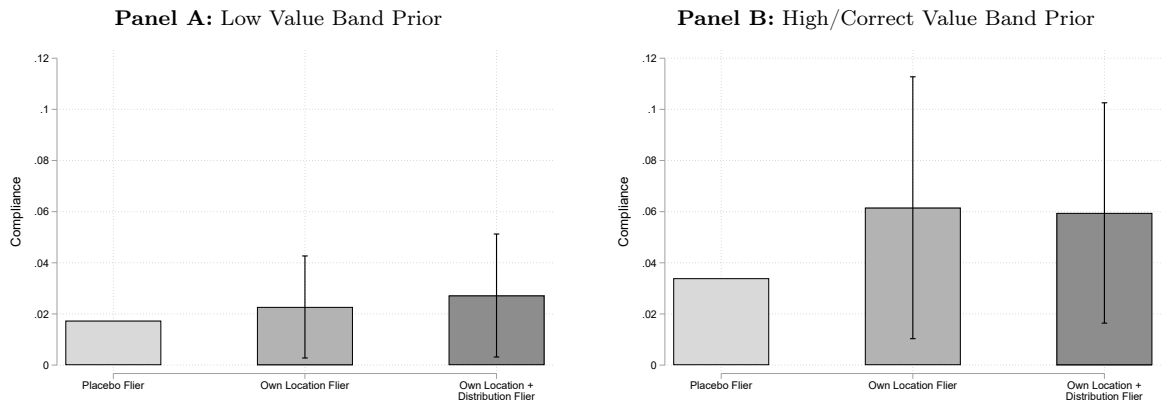
Notes: This figure summarizes the results of the endline information experiment on self-reported intention to pay the property tax in 2025. Panel A shows the average intention to pay by treatment comparing taxpayers who received information about the tax system (dashed line) or not (filled bar). Panel B compares the treatment effect of information for Progressive and Proportional across value bands. We discuss this figure in Section 6.

Figure A28: 2025 Tax Bill Experiment — Treatment Effects by Time Spent Explaining Tax Bill



Notes:

Figure A29: 2025 Tax Bill Experiment — Treatment Effects by Value Band Prior



Notes:

A4 Additional Design Details

A4.1 Status Quo Adjustments

To determine the appropriate family of generalized linear model to use in the status quo revenue adjustment, we use the variance in the proportional and progressive treatment groups to perform a modified Park test, following Manning and Mullahy (2001). We find an estimated power parameter of $\hat{p} = 1.9$, supporting the use of a Gamma GLM (with a log link) for the revenue adjustment.

Table A14: Robustness — Alternative Status Quo Compliance Adjustments

		Decile of Property Value										
		Band 1: 0–60%						*Band 2: 60–80%*		*Band 3: 80–90%*	*Band 4: 90–95%*	*Band 5: 95–100%*
	All Deciles Pooled	1	2	3	4	5	6	7	8	9	9.5	10
Panel A: Status Quo Compliance Adjustment - Probit												
Proportional	-0.013***	-0.000	-0.009*	-0.010**	-0.016***	-0.013***	-0.023***	-0.014***	-0.012***	-0.016***	-0.012*	-0.017***
	(0.003)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.003)	(0.004)	(0.004)	(0.007)	(0.005)
Progressive	0.058***	0.068***	0.080***	0.095***	0.120***	0.114***	0.097***	0.015***	0.012***	-0.010**	-0.006	-0.019***
	(0.006)	(0.009)	(0.009)	(0.010)	(0.011)	(0.011)	(0.012)	(0.005)	(0.005)	(0.004)	(0.008)	(0.005)
Observations	96254	9460	9613	9717	9738	9776	9740	9689	9616	9642	2370	6893
Control Mean	0.027	0.026	0.028	0.031	0.032	0.029	0.035	0.026	0.019	0.024	0.015	0.023
Panel B: Status Quo Compliance Adjustment - OLS												
Proportional	-0.022***	-0.007	-0.019***	-0.023***	-0.033***	-0.029***	-0.038***	-0.015***	-0.013***	-0.016***	-0.012*	-0.014***
	(0.003)	(0.006)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.003)	(0.004)	(0.004)	(0.007)	(0.005)
Progressive	0.050***	0.062***	0.071***	0.083***	0.102***	0.098***	0.082***	0.014***	0.011**	-0.010**	-0.006	-0.016***
	(0.006)	(0.009)	(0.010)	(0.010)	(0.011)	(0.011)	(0.012)	(0.005)	(0.005)	(0.004)	(0.008)	(0.005)
Observations	96254	9460	9613	9717	9738	9776	9740	9689	9616	9642	2370	6893
Control Mean	0.036	0.032	0.038	0.044	0.050	0.045	0.050	0.028	0.021	0.024	0.015	0.020

Notes: This table shows the robustness of our main results on compliance to alternative functional forms used in the Status Quo compliance adjustment. Panel A shows our main specification (Probit), and Panel B uses OLS. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels.

A4.2 Matching Algorithm for Facilitation Appointments

Our research also incorporated a timing treatment component designed to test whether eliciting households' preferred visit dates improves tax collection.[51] Households were randomly assigned to one of two groups. In the first group, enumerators collected information during bill delivery on the six dates that each household most preferred for a follow-up visit by the tax collector. In the second group, visit dates were assigned without reference to individual preferences. The rationale for collecting stated preferences was to identify, for each neighborhood, the visiting day that maximized aggregate preferences based on the distribution of individual rankings.

To operationalize this, we developed a matching algorithm that implemented a greedy assignment heuristic. The algorithm sequentially assigns visit days to neigh-

[51] We are very grateful for Juan Ferrer for help with the matching algorithm.

Table A15: Robustness — Alternative Status Quo Revenue Adjustments

	All Deciles Pooled	Decile of Property Value 1	2	3	4	5	6	7	8	9	9.5	10
Panel A: Status Quo Rate Adjustment - Gamma GLM with Log Link												
Proportional	50.872	31.652	1.965	18.237	-8.241	0.135	-42.327	-5.680	-17.016	113.194	-200.222	-212.604
	(45.829)	(25.014)	(26.089)	(33.192)	(26.987)	(31.596)	(41.874)	(45.925)	(61.265)	(125.382)	(267.258)	(440.642)
Progressive	212.955***	98.689***	100.515***	93.065***	147.952***	186.119***	176.625***	154.589***	245.722***	271.131**	134.068	58.459
	(75.016)	(20.825)	(27.090)	(25.275)	(25.924)	(31.333)	(43.294)	(45.363)	(62.694)	(129.949)	(318.721)	(872.059)
Observations	96254	9460	9613	9717	9738	9776	9740	9689	9616	9642	2370	6893
Control Mean	281.161	93.412	125.595	162.765	169.473	176.774	241.283	255.338	256.759	448.946	484.844	1559.102
Panel B: Status Quo Rate Adjustment - Poisson GLM with Log Link												
Proportional	65.581	31.639	1.935	18.099	-8.449	0.103	-43.702	-5.611	-17.980	117.152	-306.914	161.732
	(45.366)	(25.011)	(26.089)	(33.191)	(26.985)	(31.595)	(41.868)	(45.918)	(61.285)	(125.196)	(264.569)	(438.442)
Progressive	227.643***	98.675***	100.487***	92.924***	147.745***	186.084***	175.239***	154.648***	244.746***	275.064**	28.150	433.953
	(74.605)	(20.823)	(27.090)	(25.275)	(25.923)	(31.332)	(43.287)	(45.356)	(62.717)	(129.764)	(315.809)	(870.268)
Observations	96254	9460	9613	9717	9738	9776	9740	9689	9616	9642	2370	6893
Control Mean	266.473	93.433	125.625	162.908	169.689	176.820	242.642	255.263	257.724	444.980	589.805	1184.410

Notes: This table shows the robustness of our main results on revenue to alternative functional forms used in the Status Quo revenue adjustment. Panel A shows our main specification (a Gamma GLM with a log link), and Panel B uses a Poisson GLM with a log link. All regressions include stratum fixed effects. Standard errors are clustered at the neighborhood level. ***, **, and * indicate significance at the 1, 5, and 10% levels.

borhoods by prioritizing all their households' highest-ranked preferences and filling available capacity as early as possible. Each iteration ensures that no day is allocated to more than one neighborhood and that each neighborhood receives only as many visit days as its calculated capacity allows. We use the greedy approach as it provides a transparent, computationally efficient, and field-feasible method that quickly secures the largest possible share of first-choice assignments.

Integrating the random treatment arm

Households in the random treatment arm are processed alongside choice arm households so that capacity is managed jointly at the neighborhood by day level. For these households, we generate day rankings from a uniform distribution over the same tax campaign horizon. Conceptually, this places the random arm on an equal footing regarding visits capacity while preserving the experimental status that their schedules are not preference based. The combined dataset, which stacks choice arm preferences and random arm pseudo preferences, is the input to the matching stage.

Scoring function and aggregation

To quantify individual preferences, we defined a value function that transforms each ranked choice into a corresponding numerical weight. The function is specified as $v = 11 - \text{preference}$ where the most preferred option (preference $= 1$) receives a value of 10, and subsequent ranks decrease linearly by one unit for each lower preference. When a day is not part of an individual's elicited set of preferences, its value is set to

zero. We intentionally maintained a gap between the least preferred option ($v = 5$) and non-preferred options ($v = 0$). This distinction reflects the qualitative difference between a day that is explicitly ranked, even if least preferred, and a day that was never chosen. By keeping a positive value for all stated preferences, the algorithm acknowledges that even the least preferred options provide some utility compared to days that were not chosen at all. This gap ensures that unlisted days are not treated as slightly preferred, allowing the algorithm to prioritize assigning households to one of their explicitly expressed choices whenever possible. Then, for each neighborhood and candidate day, we compute the mean value across all individuals which measures the expected preference quality if the neighborhood is scheduled on that day.

Two way ranking and assignment

The algorithm performs two complementary rankings. First, for each day, we identify the neighborhood with the highest mean value. Ties are broken by the count of individuals who list that day. Second, for each neighborhood, we identify the day with the highest mean value. Ties are broken by the same count based rule. Using these two rankings, we select for each neighborhood the top day among the days for which that neighborhood also appears as the top ranked neighborhood. A day can tentatively appear matched to more than one neighborhood. To enforce that each day is assigned to at most one neighborhood, we retain only the neighborhood that has the highest mean value on that day. We repeat this process until every day is linked to at most one neighborhood.

For each neighborhood day pair, we assign households to that visit day subject to the expected daily capacity of collectors. We include only households in that neighborhood that listed the selected day among their six preferences. Within that filtered set, we order households by the rank of the selected day, that is, first those who ranked it as first choice, then second choice, and so on. We admit households in that order until the thirty slots are filled. If fewer than thirty households in the neighborhood listed that day, all such households are admitted.

After fixing the first batch of neighborhood day assignments, we remove those days from the choice sets of the remaining households and mark the assigned households as scheduled. This shrinks the feasible set for the next iteration and prevents the algorithm from assigning the same day twice. For each household that remains unscheduled, we compress their ranks so that the best remaining option becomes the new first choice, the next best becomes the new second choice, and so on. This re ranking ensures that individuals who lost a preferred day in the previous round still have their best remaining option prioritized. We then recompute the neighborhood by day summaries using the updated preference sets, re run the two way ranking, and repeat the uniqueness enforcement and household level assignment. We continue iterating until each neighborhood has received the number of days implied by its size or the pool of candidate days is exhausted.

Final pass for unmatched individuals

After all neighborhood days have been assigned and filled to capacity where possible, a residual share of individuals may remain unmatched to any of their elicited preferences. For these individuals we implement a distance based heuristic within their neighborhood. We compute, for each person, the absolute distance in days between each of their elicited preferences and each of the already scheduled visit days for their neighborhood. We then order the neighborhood days for that person by a ladder of distances that prioritizes the next calendar day, then the previous calendar day, then two days after, then two days before, and so on. If two neighborhood days are at the same calendar distance, we break ties using proximity to the highest ranked preference. We then assign the person to the highest ranked neighborhood day in this ordered list that still has free capacity. If the first candidate day is full, we consider the next day in the list, and we continue until either a slot is found or all days are full. This final pass preserves as much of the spirit of the elicited preferences as possible, since it seeks the nearest available date around the highest ranked options.

A5 Welfare Implications Across the Property Value Distribution

Following Best et al. (2025), we consider a setting with a unit mass of two types of property owners: $\theta \in \{H, L\}$, with properties generating housing consumption flows $y_H > y_L$. Each owner faces a tax liability T_θ and decides whether to comply.

Compliance Decision. An owner complies when paying the tax yields higher utility than non-compliance net of the idiosyncratic delinquency cost γ_i:

$$u(y_\theta - T_\theta) > u(y_\theta) - \gamma_i$$

The delinquency cost γ_i is distributed according to $F(\gamma)$ and encompasses tax morale, fear of penalties, social stigma, and psychological costs. The threshold delinquency cost that makes an owner indifferent is $\gamma_\theta^* = u(y_\theta) - u(y_\theta - T_\theta)$, yielding compliance rate $c_\theta = 1 - F(\gamma_\theta^*)$.

Welfare. Welfare for type θ is:

$$V_\theta = \int_{-\infty}^{\gamma_\theta^*} [u(y_\theta) - \gamma] dF(\gamma) + \int_{\gamma_\theta^*}^{\infty} u(y_\theta - T_\theta) dF(\gamma)$$

This accounts for: (1) utility of compliers who pay T_θ, (2) utility of non-compliers who keep full income but bear delinquency cost γ, and (3) the distribution of delinquency costs.

Progressive Reform. Consider a reform with $dT_L < 0$ (tax cut for low-value properties) and $dT_H > 0$ (tax increase for high-value properties). Considering the

empirical results from our study, suppose compliance is highly elastic at the bottom ($\varepsilon_L > 1$, where $\varepsilon_\theta \equiv -\frac{\partial c_\theta}{\partial T_\theta}\frac{T_\theta}{c_\theta}$) and relatively inelastic at the top ($\varepsilon_H \approx 0$).

Low-value property owners: Better off. The welfare change is:

$$dV_L = \underbrace{c_L u'(y_L - T_L)(-dT_L)}_{\text{existing compliers gain}} + \underbrace{\int_{\gamma^*_{\text{new}}}^{\gamma^*_{\text{old}}} [\gamma - (u(y_L) - u(y_L - T_L^{\text{new}}))] dF(\gamma)}_{\text{newly compliant escape delinquency}}$$

Both terms are positive. Existing compliers pay less in taxes. For newly compliant owners, those with delinquency costs $\gamma \in (\gamma^*_{\text{new}}, \gamma^*_{\text{old}})$ switch from non-compliance to compliance. Under the old regime, they bore delinquency cost γ to avoid paying T_L^{old}; under the new regime, they pay $T_L^{\text{new}} < T_L^{\text{old}}$. For these owners, the welfare gain is $\gamma - [u(y_L) - u(y_L - T_L^{\text{new}})] > 0$, since by definition $\gamma > \gamma^*_{\text{new}} = u(y_L) - u(y_L - T_L^{\text{new}})$. By revealed preferences, the marginal owners at exactly γ^*_{new} are indifferent, but all switchers with higher delinquency cost are better off.

High-value property owners: Worse off. With inelastic compliance at the top, owners who remain compliant experience:

$$dV_H = -c_H u'(y_H - T_H) dT_H < 0$$

They face higher tax burdens with limited behavioral adjustment. Even though they continue to comply (revealing that compliance remains preferable to non-compliance at the new rate), their continued compliance does not imply they prefer the higher tax.

Overall Social Welfare. Tax revenue $r = c_L T_L + c_H T_H$ finances local public goods with social benefits $B(r)$ and marginal benefits $b(r) = B'(r)$. The revenue change from the reform is $dr = c_L(1 - \varepsilon_L)dT_L + c_H(1 - \varepsilon_H)dT_H > 0$, since both components are positive. Social welfare combines the welfare of both types of households and the benefits of the public good: $W = \omega_L V_L + \omega_H V_H + B(r)$, where ω_θ are Pareto weights reflecting society's distributional preferences. The total welfare change is $dW = \omega_L dV_L + \omega_H dV_H + b(r) \cdot dr$. The reform is progressive in a strong sense: low-value property owners gain directly ($dV_L > 0$), high-value property owners lose directly ($dV_H < 0$), and all households benefit from increased public goods ($dB > 0$).

The overall welfare effect depends on the Pareto weights ω_L and ω_H. With standard distributional preferences where society places higher weight on low-value property owners ($\omega_L > \omega_H$)—reflecting both equity concerns and the higher marginal utility of consumption at lower income levels ($u'(y_L - T_L) > u'(y_H - T_H)$)—the positive term $\omega_L dV_L$ tends to dominate, making the reform welfare-improving. Following **?**, we can express this using generalized social marginal welfare weights $g_\theta \equiv \omega_\theta u'(y_\theta - T_\theta)/b(r)$, which measure how much society values an additional dollar of consumption for type θ relative to public goods. The reform increases welfare when the weighted gains at the bottom exceed the weighted losses at the top: $[\omega_L c_L u'(y_L - T_L) + b(r)c_L(\varepsilon_L - 1)](-dT_L) > [\omega_H u'(y_H - T_H) - b(r)c_H]dT_H$.