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Trade-offs in the design of simplified tax regimes: Evidence from Sub-Saharan Africa

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Abstract

This paper provides novel evidence of the trade-offs policy makers face when designing simplified tax regimes for small businesses. First, it provides a comprehensive stocktaking of the main features of these regimes across Sub-Saharan Africa: they are adopted by two-thirds of countries, but their design varies greatly. Second, it draws on administrative and survey data for a thorough examination of a specific simplified tax regime. This analysis shows most small businesses lack knowledge about design features, such as the existence of a minimum exemption threshold, but they react strongly to increases in tax rates by lowering their declared turnover. Finally, the paper presents the results of an experiment that encourages taxpayers to pay fixed amounts—a potential alternative design of a simplified tax regime that aims for a better balance of the trade-offs facing policy makers. The findings show that providing simple guidance about how much small businesses with similar characteristics typically pay in taxes can increase revenue, but this reduces equity among taxpayers.

Keywords: Taxation, Public Finance, Small Businesses, Randomized Experiment
JEL codes: D04, D80, D90, H20, H30, H50

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1 Introduction

Small businesses are the main source of income for households across Sub-Saharan Africa (outside agriculture) (International Labour Organization, 2019), however, they contribute a very modest fraction of total tax revenue. Many governments have tried to address this by registering large numbers of small businesses (Benhassine *et al.*, 2018, Moore *et al.*, 2018) and using simplified tax regimes (STRs) for registered, small businesses with low revenue levels (Mas-Montserrat *et al.*, 2023). These regimes, often called turnover or presumptive tax regimes, are meant to provide an 'on-ramp' for small businesses to meet their tax obligations as they are easier to comply with than more complex corporate or personal income tax regimes.[1] Beyond simplifying the taxpaying process, policy makers typically aim for these STRs to collect meaningful amounts of revenue from small businesses that were otherwise likely to have remained informal. In addition, there is often a desire to ensure that the tax burden is distributed equitably among small businesses and across tax types. Despite the widespread use of STRs, relatively little is known about how well, in practice, these regimes actually meet these objectives of revenue collection, simplicity, and equity.

We present novel empirical insights about the trade-offs that policy makers face when setting the design features of STRs in Sub-Saharan Africa by conducting a comprehensive cross-country review of these regimes and a detailed examination of the turnover tax (TOT) regime in Kenya. We systematically document the specific design features of STRs in each Sub-Saharan African country (when one exists) by reviewing the most recent tax legislation and policy guidance notes. Building on this review, we conduct detailed analysis of ten years of tax administrative data from the TOT regime in Kenya. Kenya provides an insightful case study of the challenges governments face when taxing small businesses, as despite there being more than 1 million potential TOTpayers, the regime contributes less than 1 percent of total tax revenue. In recent

[1]For example, in February 2024 in Kenya, small businesses with an annual turnover between USD7,500 and USD187,500 were only required to calculate their monthly turnover and to pay 3 percent of this amount in tax. The minimum threshold is set to align with the personal income tax exemption threshold.

years, there have been several attempts to improve the TOT regime, including changes in rates and thresholds, which we exploit for identifying variation. We also implement a randomized experiment with over 10,000 TOT payers that tests an alternative design of an STR that aims to better balance the objectives of revenue collection, simplicity, and equity. This analysis is complemented by two surveys, one of registered small businesses and the other of TOT payers,[2] which helps to unpack the mechanisms behind the behavior of taxpayers.

Three key design features of STRs that influence the trade-offs that policy makers face are the level of minimum exemption thresholds, whether businesses are required to pay a set fee or a percentage of their turnover, and the size of tax obligations. When minimum exemption thresholds are set very high, this theoretically simplifies the regime for the smallest businesses as they are no longer required to pay tax, and revenue authorities do not need to register and maintain large databases of very small businesses; however, this reduces the total tax revenue that could be collected. Requiring all small businesses to pay a set fee (i.e., a lump-sum payment) makes tax obligations simpler and generates revenue, but this is quite regressive as the effective tax rate is inversely related to the size of business income. Requiring small businesses to pay a percent of their firm-specific turnover is a more equitable way of collecting revenue than requiring them to pay a set fee; however, this introduces greater complexity as small businesses often do not have extensive transaction records. Underlying all these trade-offs is the size of the tax obligations that small businesses must pay. When there is a desire to maintain equity across tax types, there is a need to consider how STRs relate to corporate or personal income tax regimes, particularly to ensure that as businesses grow, they are not discouraged from graduating to the corporate income tax (CIT) regime.

We conduct a comprehensive review of STRs across Sub-Saharan Africa, which shows that governments have implemented these regimes in a wide variety of ways, resulting in stark differences in how trade-offs between revenue collection, simplicity,

[2]Small businesses that are registered with the government may or may not be registered with the revenue authority as a TOT payer.

and equity are balanced. Two-thirds of countries in the region had some form of STR for small businesses in March 2024, and in the remaining countries, small businesses that reach a certain size are expected to comply immediately with more complex corporate or personal income tax regimes. Among the countries with STRs, three stylized facts emerge about how they have been designed. Firstly, only 40 percent of countries apply a minimum turnover threshold, which means in the remaining countries, as soon as any business, no matter how small, makes any revenue, they are required to pay tax under the STR. Secondly, around 60 percent of countries rely solely on a percent of turnover for determining the amount of tax owed, whereas in the remaining countries, either a set fee or a combination of both is used. Thirdly, the relative size of tax obligations levied on small businesses varies considerably, with the profit rate that businesses would need to make for their level of taxation to be equal under the STR and CIT regimes ranging from 2 to 20 percent.

To shed light on the real-world implementation of an STR, we conduct a detailed examination of tax administrative data from the TOT regime in Kenya and identify three major shortcomings. Firstly, the minimum turnover threshold that aims to exempt the smallest businesses from paying tax is not binding in practice. On average, around 70 percent of businesses that pay TOT should be exempt as their declared turnover is below the minimum threshold (collectively, these businesses pay around one-third of the total amount of TOT collected). Survey data suggests that this is very likely due to a lack of knowledge by taxpayers and potentially due to a belief that filing a non-zero amount in tax will decrease the likelihood of being audited by the Kenya Revenue Authority (KRA). Secondly, efforts to mobilize revenue by increasing the amount of tax required from small businesses are partly offset by businesses lowering their declared turnover. Results from an event study show that, on average, in response to a three fold increase in the tax rate, businesses immediately decrease their declared turnover by around one-third, meaning the increase in revenue collection is less than proportional to the tax rate increase. Thirdly, requiring taxpayers to calculate a percentage of their monthly turnover to be paid in tax appears to be challenging

for some businesses. Survey data shows that most registered businesses were unable to calculate basic percentages and a non-trivial share did not have extensive transaction records. Instead, it appears many small businesses rely on heuristics to determine their tax liability, as a non-trivial share consistently pays the same amount in TOT each month despite numerous policy changes altering their tax liability up and down (consistent with similar findings in other settings such as Tourek (2022) in Rwanda).

To test an alternative design of an STR that aims to better balance the trade-offs inherent in these types of regimes, we implemented a randomized experiment across over 10,000 registered TOT payers in Kenya. Treated businesses were encouraged to pay a set fee in TOT that was customized based on their business type and location.[3] This alternative design simplifies the process for small businesses by proposing the amount of tax required to be paid. Ex-ante, there is a concern that a set fee may be less equitable than requiring a proportion of turnover to be paid, but customizing the TOT amount is more equitable than a single set fee being required across the country as there is much less variation in turnover of small businesses within the same location and business type. On average, taxpayers allocated to the alternative design of the TOT regime paid a much larger amount of tax (and slightly increased the share of taxpayers who filed). The intent to treat effect was in the order of a 11.7 percent increase in the amount of tax paid, and the treatment on treated effect was a 19.8 percent increase. These sizable effects were almost exclusively driven by taxpayers who were below the median in the distribution of the previous months' tax payment amounts. In other words, encouraging taxpayers to pay a set fee led to relatively smaller businesses[4] paying more tax and had no meaningful effect on relatively larger businesses. Consequently, introducing greater simplicity into the TOT regime came at the cost of reducing vertical equity between taxpayers.

Collectively, the insights presented in this study highlight just how challenging it is

[3]This fee was the equivalent of the amount of TOT that the average business with these characteristics was expected to pay under the existing regime based on previous filing behavior (as such, if compliance were identical, then the alternative and the existing regime would yield the same amount in revenue).

[4]This assumes that the amount of tax paid by taxpayers is a reasonable proxy for business size.

for policy makers to balance the trade-offs between revenue collection, simplicity, and equity when designing STRs. The large variation in the design of these regimes across the region (despite having somewhat similar economic circumstances) and frequent attempts to improve design features in Kenya are indicative of governments struggling to identify the best way to tax small businesses. While some design features seem appropriate in theory, such as minimum thresholds, we show that in practice, they often fail to meet their objectives. The findings from the randomized experiment suggest that governments may be able to raise additional revenue through an alternative STR with customized set fees based on firm characteristics, but this may have a negative impact on the equity of tax collection. Given the sizable trade-offs in designing these regimes, it raises the question of whether it even makes sense to try to tax small businesses. Especially given that most of these taxpayers are likely to be in households that live below the national poverty line, and there may well be quite limited revenue potential even if an "ideal" design was implemented and near-perfect compliance was attained (Moore *et al.*, 2018).

This paper contributes to several strands of literature. First, it adds to the literature on small business taxation. Existing studies have shown that small businesses often struggle to navigate the formal tax regime because of limited knowledge (Joshi *et al.*, 2014) and often encounter enforcement challenges, leading to opportunities for informality and corruption (Fjeldstad & Heggstad, 2011, Hassan & Prichard, 2016). As a result, they have been shown to engage in seemingly erroneous tax filing behavior such as nil-filing (Mascagni *et al.*, 2022, Santoro & Mdluli, 2019), targeting past payment amounts (Tourek, 2022), and disadvantageous misreporting on sales and purchases (Almunia *et al.*, 2024). We extend this body of knowledge by documenting and quantifying the problem of taxpayers filing and paying below the minimum threshold, a behavior not previously covered by the literature. We also show that "nuisance taxation" of small businesses appears to exist to some extent in the formal tax regime (where businesses appear to pay something to avoid enforcement challenges), while this has traditionally been thought of as informal payments (Dom *et al.*, 2022). Build-

ing on findings by Tourek (2022), we provide further evidence that a non-trivial share of small businesses persistently target past payment amounts to determine their tax liability, despite numerous changes in the TOT regime over time that alter their tax liability up and down. We also add to this literature about small business taxation by conducting a comprehensive stock-take of STRs in Sub-Saharan Africa. While there are overviews of such regimes (Engelschalk & Loeprick, 2015, Wei & Wen, 2023), this paper presents the first country-by-country review of the region, which is estimated to host a quarter of the world's small businesses (IFC, 2017).

Second, we contribute to the literature examining the simplification of the tax system. There has been a growing body of work in recent years around the possibility of raising revenue by making the process of paying taxes simple (Antinyan & Asatryan, 2024, JPAL, 2022). In practice, many STRs are still viewed as overly complex (Coolidge & Yilmaz, 2016, Komatsu, 2024, Mirrlees *et al.*, 2011). While simplifying the tax process can improve compliance, this may not necessarily raise more revenue (Hoy *et al.*, 2024), or it can lead to the manipulation of tax reporting (Al-Karablieh *et al.*, 2021). One of the key questions in this literature is whether such regimes simplify tax reporting (Aghion *et al.*, 2024) or just make it easier to evade taxes (Best *et al.*, 2015). Our study contributes to this literature by comparing the implications for compliance from an STR based on a set fee as opposed to a percentage amount. We show how this simplification can increase revenue, but it comes at a cost of equity considerations. This provides empirical evidence supporting more theoretical discussion about trade-offs policy makers face when simplifying tax regimes, such as (Engelschalk, 2007), who argues tax regimes can be made simple or fair, but not both.

Finally, this paper contributes to the literature on how tax policies and administration can shape the equity of fiscal policies in developing countries (e.g., see Bachas *et al.* (2023), Hoy (2022), Inchauste & Lustig (2017). Owners and employees of small businesses are often relatively poor compared to other taxpayers, and the extent to which they are integrated into the tax system has important implications for inequality (Inchauste & Lustig, 2017). We show that across Sub-Saharan Africa there are

vastly different approaches to taxing small businesses, even though there are somewhat similar economic circumstances, and this contributes to variation in inequality across countries. While existing studies have shown how STRs have been shown to produce regressive outcomes in high-income countries (Aghion *et al.* (2024)), this paper is among the first (along with Tourek (2022)) to show inequitable outcomes of an STR in lower-income settings. These inequitable outcomes manifest in three ways: minimum thresholds that are not binding in practice, taxpayers' responses to changes in taxation contribute to inequality, and efforts to simplify the tax paying process only increase tax payments made by taxpayers below the median of the distribution.

This paper is organized as follows. Section 2 provides a comprehensive overview of STRs, describing three key design features and how they vary across Sub-Saharan African countries. Section 3 provides details about the TOT regime in Kenya and the tax administrative and survey data that this study draws on. Section 4 presents the findings of the analysis of taxpayer behavior in Kenya, including the results of an event study and randomized experiment. Section 5 discusses the implications of this analysis of the trade-offs faced by policy makers when designing STRs.

2 Review of Simplified Tax Regimes

2.1 Design Features of Simplified Tax Regimes

When designing an STR, policy makers will first need to determine the regime's objectives. These objectives typically involve revenue collection, simplicity, and equity while minimizing real distortions. They can be, however, in conflict with one another. For example, a more progressive (i.e., vertically equitable) tax regime is typically less simple, and too high a tax burden may undermine the functioning of a simplified tax regime, resulting in inequitable outcomes. The key design features of STRs that influence the trade-offs between equity, simplicity, and revenue collection can roughly be divided into three categories: i) the level of eligibility thresholds; ii) whether a set fee or a percentage of turnover is required to be paid, and; iii) the size of tax obligations.

Below, we discuss design principles for each of these three categories and reflect on the implications for the objectives of STRs.

2.1.1 Level of eligibility thresholds

STRs often apply to businesses within a certain range of revenue. They may include an *exemption threshold*, meaning that businesses with low enough revenue are exempt from any taxation, and a *ceiling threshold*, such that businesses with high enough revenue are liable for the standard taxation regime (e.g., CIT). There are no "ideal" thresholds that can be applied to all countries (Engelschalk, 2007). Thresholds depend on the standard tax regime in place – how the STR interacts with the standard tax regime – and characteristics of small businesses – how profitable they are, how widespread non-compliance is, and whether businesses are so small that the revenue potential does not offset the administrative and compliance burden.

Key design considerations include i) setting the ceiling threshold that separates the STR from the regular CIT regime and ii) determining whether a minimum exemption threshold is warranted. In the literature, the emphasis is often on setting the ceiling threshold to separate the STR from the standard CIT regime (see, for example, Mas-Montserrat *et al.* (2023), Wei & Wen (2023)). The general guidance is that ceiling thresholds should not be set too high, as this could increase the number of medium-sized businesses in the simplified regime, and that eligibility criteria should be aligned (and should evolve) with tax administrative capacity Engelschalk & Loeprick (2015), Mas-Montserrat *et al.* (2023), Wei & Wen (2023). Ceiling thresholds should also be carefully aligned with Value Added Tax (VAT) thresholds so that the STR is the only tax liability for small businesses (Engelschalk, 2007).[5] In contrast, there is little guidance in the literature on setting minimum thresholds. It is not always included in the design (Mas-Montserrat *et al.*, 2023), and can be used to minimize the number of businesses

[5]Aligning the ceiling threshold with VAT entry requirement diminishes the complexity of the tax system, and is logical in the sense that VAT requires maintaining accounting records and financial statements. Hence, businesses that are liable for VAT should be able to deal with the higher demands of standard CIT accounting. In addition, ideally, the STR would replace not only centrally levied taxes but also local taxes.

that are covered by the STR (Thuronyi, 2004). A sensible rule of thumb that is applied in the case of Kenya is that the exemption threshold for the STR aligns with the exemption threshold under the personal income tax regime.

The choice of thresholds and taxpayers' behavioral response to it affect tax equity, simplicity, and revenue collection. Firstly, thresholds define which taxpayers are subject to which taxes. This affects respective tax outcomes and, thus, impacts vertical tax equity. Secondly, if thresholds overlap, taxpayers may be subject to various tax regimes with different compliance requirements. This reduces the simplicity of the tax regime as a whole. Thirdly, thresholds provide behavioral margins for taxpayers to optimize on. A high ceiling threshold could lead to bunching by medium-sized businesses just below the threshold as they try to avoid upgrading to the standard CIT regime, leading to lower revenue outcomes for the tax system as a whole.[6] This, in turn, also affects tax equity, as these businesses are treated and taxed differently than businesses (with similar effective turnover) in the standard CIT regime.

2.1.2 Whether a set fee or a percentage of turnover is required to be paid

STRs are mostly based on the turnover (or gross income) of businesses.[7] policy makers then need to decide whether to tax businesses using a set fee or a percentage of their turnover.

Set fees are the most basic form of an STR as they typically do not require businesses to maintain any form of administrative records or to calculate tax liabilities, whereas a tax based on a percentage of turnover does. Set fees have the advantage of being transparent, predictable, and easy to administer, but their drawbacks include regressivity, where smaller (and less profitable) businesses face disproportionately larger effective tax rates. Differentiated set fees can induce some tax progressivity, but they can also create challenges, for example when marginal turnover increases lead to disproportionate increases in the tax burden. They also require a certain degree of book-

[6] Assuming that tax liability is generally higher under the standard CIT regime.

[7] The alternative is an indicator-based regime, based on, for example, business size, output or other indicator of economic activity (Engelschalk, 2007, Loeprick, 2009).

keeping in order to determine the appropriate threshold (Mas-Montserrat *et al.*, 2023).

Taxes that are determined as a percentage of turnover can be proportional or progressive. They have higher compliance costs for taxpayers as they require some form of basic accounting of business operations (to measure turnover) and the ability to calculate tax liabilities. These requirements under an STR are, however, much less burdensome compared to the standard CIT regime. A proportional tax rate is typically regarded as much simpler to administer than a progressive tax schedule. It can, however, also distort incentives by discouraging investment in or the use of productive assets (Engelschalk, 2007, Mas-Montserrat *et al.*, 2023).

The determination of whether a set fee or a percentage of turnover is required to be paid by small businesses has important implications for tax equity and simplicity. A more progressive structure automatically implies a higher degree of record keeping and more complicated calculations of the tax liability. Progressivity thus reduces simplicity. Guidance from the existing literature would suggest that regardless of the approach used, it is valuable to keep rules for the determination of tax liability as simple as possible (Engelschalk, 2007).

2.1.3 Size of tax obligations

There is a substantial design challenge when it comes to fixing the appropriate size of tax obligations under an STR. Revenue authorities often face pressure to bring in revenue, creating a risk of excessive tax burdens on small businesses with comparatively low-profit margins and under-taxation of larger businesses with very high-profit margins. When tax burdens of STRs are too high, this may encourage smaller businesses to remain informal (Engelschalk, 2007), and consequently, this undermines the objective of providing an 'on-ramp' for small businesses into taxation. Alternatively, when tax burdens of STRs are too low, this may create an incentive for larger businesses to under-declare turnover or split up in order to be able to move into or remain in the STRs, avoiding the often higher tax rate of the standard CIT regime (Best *et al.*, 2015, Wei & Wen, 2023). It is thus very difficult to get the size of tax obligations right

(Engelschalk, 2007).

A recent study by Wei & Wen (2023) proposes the optimal TOT rate for STRs from a revenue maximization perspective to be around 2.5 percent.[8] They find that this rate balances the risk of bunching just below the threshold separating the TOT regime from profit taxes (if the rate is too low) and of choosing to produce in the informal sector (if the rate is too high).

The size of tax obligations and taxpayers' responses to them affect the equity and revenue yield of the tax system as a whole. High tax obligations may result in relatively higher tax burdens for the smallest businesses, leading to inequitable outcomes. Similar to the dynamics discussed in response to thresholds, taxpayers often adjust their behavior in response to the size of tax obligations. When tax burdens are too high, this may sustain informality and incentivize under-reporting by relatively larger businesses, affecting tax equity and resulting in lower revenue for the tax system as a whole.

In summary, when designing an STR, there generally are a number of alternatives for each of the three categories (eligibility thresholds, whether set fee or percentage of turnover, and the size of tax obligations). There are forms of STRs that are simple but not fair, forms that are fair but, in fact, not simple at all, and various mixes in between. The next section examines how design choices of STRs have been designed de jure in Sub-Saharan Africa.

2.2 Simplified Tax Regimes in Sub-Saharan Africa

In this section, we focus on three key areas where there is considerable variation in the design of STRs in Sub-Saharan Africa. Our analysis is based on a comprehensive review of STRs across countries in the region, using the most recent tax legislation and policy guidance notes on business taxation in these countries. The review shows that two-thirds of countries in the region had some form of STR for small businesses in March 2024, and in the remaining countries, small businesses that reach a certain size

[8] Based on simulations set largely on evidence from countries in Sub-Saharan Africa.

are expected to immediately comply with more complex corporate or personal income tax regimes. Among the countries with STRs, governments have implemented STRs in a wide variety of ways, resulting in stark differences in how trade-offs between revenue collection, simplicity, and equity are balanced.

Three stylized facts emerge about variations in the design of STRs across the region. Firstly, only 40 percent of countries apply a minimum turnover threshold, which means that in the remaining countries, as soon as a business makes any revenue, it is required to pay tax under the STR. Secondly, around 60 percent of countries rely solely on a percentage of turnover for determining the amount of tax owed, whereas in the remaining countries, either a set fee or a combination of both is used. Thirdly, the relative size of tax obligations under the STR varies considerably across countries, from being relatively small to being a substantial burden that likely exceeds the effective tax rate under the CIT regime. We discuss each of these facts in more detail below.

Fact #1: Only 40 percent of countries with STRs apply a minimum threshold

As documented in section 2.1, most research on STRs and policy advice following from it focuses on the threshold separating the TOT regime from standard CIT regimes. Wei & Wen (2023) find that the optimal threshold of this margin lies between $65,000 and $95,000 for lower-income countries. In our analysis we focus on the minimum threshold – the threshold separating the STR from the informal sector. We find that this minimum threshold in practice lies between $0 (no threshold) and roughly $18,250 (Table A.1). Sixty percent of countries with STRs do not apply a minimum threshold ((Figure 1). This imposes relatively high compliance burdens on very small businesses and implies that tax authorities have to deal with very large numbers of taxpayers in the simplified regime. Among the countries that apply a minimum threshold, the average threshold is $5,456, with countries such as Cameroon, Eswatini and South Africa setting relatively high entry thresholds (more than $15,000), and others, such as the Central African Republic, Ghana, Malawi, Rwanda, Tanzania and Uganda setting more modest thresholds between $1,500 and $3,000.

Fact #2: Around 60 percent of countries rely solely on a percent of turnover for determining the amount of tax owed, whereas in the remaining countries, either a set fee or combination of both is used.

Most countries in Sub-Saharan Africa with a simplified turnover regime (19 of 31) require tax solely to be paid as a percentage of turnover, while only three countries rely solely on a set fee (Table A.1). Nine countries use a combination of both: Rwanda and Ethiopia apply a set fee (based on the economic sector) up until a certain turnover threshold, after which a percentage of turnover applies. Uganda and Tanzania apply a set fee if no administrative records are maintained and a percent of turnover otherwise. Benin, the Central African Republic, Madagascar, and Mozambique apply a set fee or a percent of turnover, whichever is higher. Sierra Leone, on the other hand, combines a set fee and a percent of turnover. Around half of the countries with an STR apply a proportional rate, and a quarter apply either a differentiated or progressive rate. Hence, in some countries, tax rates are more progressive, whereas in other countries, they are easier to calculate, monitor, and comply with. All regimes are based on turnover,[9] except Cote d'Ivoire and São Tomé and Príncipe, which apply a tax on the basis of profits for some higher turnover thresholds.

Fact #3: The relative size of tax obligations levied on small businesses varies considerably across countries from relatively small to being a substantial burden that likely exceeds the effective tax rate under the CIT regime

As illustrated in section 2.1, the size of the tax obligation ultimately must attempt to balance between two behavioral margins: rates that are too small incentivize firms never to graduate to the regular income regime, whereas rates that are too high might discourage firms from formalizing in the first place. We find that the rates vary between 1 to 4 percent among countries that apply a proportional tax rate (Table A.1).

[9] Zimbabwe is the only country that determines the STR based on characteristics entirely different from turnover. Specifically, different set fees exist depending on the industry of the business and they are defined by indicators of economic activity such as the number of seats in a taxi. In addition, Mauritius and the Seychelles both levy tax on the basis of income as opposed to turnover

Differentiated and progressive tax rates vary widely between 0.4 and 25 percent.[10] We show large variation in tax obligations by comparing the rate of taxation under the STR (based on turnover) and the CIT regime (based on profit) in each country that has either a proportional or differentiated/progressive rate of TOT. We examine the profit rate that businesses would need to make for their level of taxation to be equal under both regimes, which we call the "break-even" profit rate (Figure 2). Businesses that have higher rates of profitability than the break-even profit rate would pay relatively less tax under the STR, while businesses that have lower rates of profitability than the break-even profit rate would pay relatively more tax under the STR. This break-even profit rate ranged from around 2 to 20 percent across countries. As such, the tax burden faced by businesses under the STR, relative to the CIT regime, varied considerably. For example, in Uganda, a business with a profit rate of 2 percent or more would pay less taxes under the STR, whereas in Cabo Verde, only business with profits above 18 percent would pay less taxes under the STR.

In sum, the analysis of real-world STRs in SSA shows a wide variety of design decisions that lead to substantial differences in the trade-off between tax equity, simplicity, and revenue collection. First, when it comes to tax equity, roughly half of the simplified regimes have some equity element by design (progressive tax rate and/or minimum threshold). Second, when considering simplicity, roughly half of countries with an STR apply a single proportional TOT rate, which is one of the simplest ways to calculate tax liability. Last, many countries with proportional or differentiated/progressive tax rates have set tax liabilities higher than what businesses would pay if they were under the CIT regime, suggesting that collecting revenue from these businesses is a priority of these regimes. The insights in this section have focused on the *de jure* features of STRs. In the next section, we examine the *de facto* implementation of Kenya's STR and taxpayers' responses.

[10]Only São Tomé and Príncipe and Cote d'Ivoire apply rates above 20 percent to some businesses, subject to simplified accounting or depending on turnover. Under the simplified regime in São Tomé and Príncipe, businesses maintain simplified accounting records for computing taxable profit, which is subject to the standard CIT rate (25 percent). Cote d'Ivoire applies a tax rate of 25 percent on profits (standard CIT rate) of companies with a turnover between XOF 200 million and XOF 500 million ($3250 - $8000). In both cases, these higher tax rates apply to profits and are similar to the standard CIT rate.

3 The Turnover Tax Regime in Kenya

3.1 Background

Small businesses in Kenya face a turnover tax (TOT) – a tax levied on resident individual businesses or small incorporated businesses, calculated based on their turnover (i.e., gross income), without the inclusion of any deduction for business expenses. Similar to other presumptive taxation regimes, it replaces income taxes that require the calculation of profits or net income, which often require some degree of bookkeeping. In the case of Kenya, most businesses in the TOT regime fall below the value-added tax (VAT) exemption threshold. TOT declarations for each month must be filed and paid by the 20th of the subsequent month. Most TOT payers file online through a website (called *iTax*), while a small share of TOT payers pay tax through a cell phone application (called *KRA M-Service*). If a business registered for TOT does not file in a given month, they are fined K Sh 1000. In practice, many dormant TOT payers have accumulated these fines over time and have not received more severe penalties.[11]

The TOT regime has faced changes to its parameters in recent years. It was first introduced in 2007 and applied to businesses with yearly turnover between K Sh 500,000 - 5 million at a rate of 3% of turnover. The first major change occurred in 2019 when the TOT regime was dropped and replaced by a presumptive tax regime to be enforced by subnational governments – the tax amount equaled 15% of the value of the business permit or trade license during issuance or renewal. Due to low take-up and reduced revenue collection, the TOT regime was reintroduced in January 2020, under the same rules as before. In response to the COVID-19 crisis, in April 2020, the TOT rate was reduced from 3% to 1%, and the turnover range was shifted to K Sh 1 million - 50 million. In July 2023, the rate was again increased to 3% while the upper threshold for the regime was reduced to K Sh 25 million. Many other Sub-Saharan African countries also made changes to their tax regime in response to the COVID-19 pandemic. However, Kenya is somewhat unique as there were already multiple changes to the STR in

[11] KRA tax officials who work on enforcement matters are set revenue targets, and consequently, they have an incentive not to focus on smaller TOT payers.

the 12 months prior to the COVID-19 pandemic.

3.2 Tax Administrative Data

The main data source used in this paper are monthly administrative records of TOT filing and payments between 2015 and 2024. Given the nature of TOT, monthly declarations mainly include the identity of taxpayers and their total declared turnover – taxes are then automatically calculated. We complement these filing data with information on TOT payments[12] and also characteristics of taxpayers, such as their declared location and business type.

In Table 1, we provide key descriptive statistics of our sample of interest. We highlight several stylized facts. First, we observe a somewhat stable number of businesses declaring ToT in the 2016 - 2018 period (between 6,000 and 7,000 per year), followed by a decline in 2020 during the COVID-19 pandemic and a rebound thereafter. In 2023, the number of businesses filing increases by almost 70% to over 17,000. As shown in Figure 3, that increase was particularly strong starting in August-September, when the number of monthly declarations climbed from 10,000 to 14,000 by November. This expansion coincides with the roll-out of a strong registration campaign by KRA involving the hiring of new agents (Revenue Service Assistants - RSAs) to improve the authority's presence throughout the country. Despite the expansion of registered small businesses as TOT payers, it should be noted that these numbers are still very likely only a fraction of total potential taxpayers: less than 3,000 taxpayers filing ToT in 2023 are registered as Nairobi residents, a city of over 4 million people. Furthermore, Nairobi City Council has over 200,000 businesses in its business licensing regime, many of which should be also part of the TOT regime. This suggests that subnational/county governments may have a stronger knowledge of the existence of unregistered businesses and the ability to tax them than KRA.

[12]Most commonly, we observe payments being linked to one declaration. In some cases, we observe payments for which no filing data exists. The main reason for that is that no declaration is generated when individuals use the KRA app to pay their TOT. This phenomenon occurs in approximately 10% of the payments across the entire sample.

In terms of geographical location, taxpayers are less concentrated than might be expected: less than 20% are registered as Nairobi taxpayers, and over 40% are outside the six largest cities/towns in the sample (Nairobi, Nyeri, Mombasa, Meru, Eldoret, and Nakuru). One possible reason for this is how tax officials' incentives for registration vary across regions. For example, in the largest metropolitan areas of Nairobi and Mombasa, the relevant margin to increase revenues is improving taxes from large corporations. On the other hand, in smaller cities and rural regions, small businesses registered as TOT taxpayers might be a relatively more important source of revenue and, therefore, face stronger registration and enforcement efforts. In other words, the true distribution of small businesses is likely more concentrated in the largest cities, but the relative proportion registered for TOT is likely higher in smaller towns.[13]

We also show that the total amount of tax declared and paid was close to Ksh. 90 million per year in 2016 - 2018, decreased to close to Ksh. 40 million in 2020, and reached 391 million by the end of the 2023/24 financial year. We note that the aggregates for tax due and tax payments are somewhat different since i) some taxpayers can file taxes but never pay, and ii) some taxpayers can pay back taxes and also pay their liabilities without filing, in case they use the M-service app.

3.3 Survey Data

To complement the tax administrative data, we draw on specific questions from two surveys of registered small businesses in Kenya that include questions about respondents' knowledge of the TOT regime. The first survey (hereafter the "in-person survey") covered 766 registered small businesses across the five largest urban areas in Kenya (Nairobi, Mombasa, Eldoret, Kisumu, and Nakuru). It was carried out between June and September 2022. The sample frame was drawn from the list of businesses registered with the Kenya National Bureau of Statistics (KNBS), stratified by counties and sectors. To be eligible for the survey, businesses were screened based on their

[13]Using VAT records in Kenya,Wiedemann *et al.* (2024) document that over 40% of businesses and 70% of value-added are generated by businesses headquartered in Nairobi county, even though its population is less than 10% of the country.

annual turnover. They were only interviewed if their turnover ranged between Ksh 500,000 and Ksh 5 million (i.e., they were meant to be covered by the TOT regime or slightly below the minimum threshold). However, the registered small businesses did not necessarily need to be registered for TOT (only 57 percent were). The survey was part of a diagnostic exercise performed by the World Bank at the request of the KRA to help improve the design of the TOT regime.

The second survey (hereafter the "SMS survey") covered 645 TOT payers in Kenya and was carried out in May and June 2024. Around 6,000 TOT payers were invited to participate in a very brief survey about their experience paying tax, via an SMS message that was sent from the KRA (refer to Appendix Figure A.1 for an example of the SMS message that was sent). The response rate was around 10 percent of taxpayers who were invited to participate in the survey, which is consistent with other studies that involve surveying taxpayers (e.g., Cruces et al. 2024). The sample frame was the database of TOT payers with a valid phone number registered with the KRA, who were randomly selected to participate in a randomized experiment (details in the following section).

Both surveys include three key questions of interest that examined taxpayers' knowledge of the TOT regime (refer to Appendix for the exact wording). The first question relates to the minimum threshold, particularly whether it exists and what level it is set at. The second question relates to the percentage of turnover that taxpayers are expected to pay. The third question provides respondents with a scenario where they need to calculate the amount of tax paid based on the annual turnover of a hypothetical business. We refer to the results of both of these surveys throughout the following section to help shed light on how a lack of knowledge among taxpayers may have influenced their behavior.

4 Findings

4.1 Descriptive Analysis

This section examines the case of Kenya to provide further insights into the challenges of setting the three key design features of STRs: eligibility threshold levels, size of tax obligations, and whether a set fee or a percentage of turnover is required to be paid.

4.1.1 Minimum turnover threshold

The first remarkable fact we observe is that around 70% of taxpayers declare yearly turnover amounts that would exempt them from paying TOT. At the beginning of our sample, the level of yearly turnover that made a business exempt from TOT was Ksh. 500,000 and then subsequently increased to Ksh. 1 million in 2020. In Figure 4, we show the distribution of businesses across brackets of yearly turnover. Before 2020, around 70% of businesses each year declared total yearly revenues below the exemption threshold of Ksh. 500,000 – that is, according to tax law, these businesses should be exempt from filing and paying TOT. After the threshold is increased to Ksh. 1 million in 2020, that share remained above 50% each year.

Not only are these businesses filing TOT each month, they are also paying taxes. In Figure 5, we show that aggregate taxes paid by businesses with turnover below the exemption threshold account for approximately 25%-35% of total taxes collected in the TOT regime. Since these businesses are smaller, the tax collected from them is less than proportional to their participation in the total number of filers, but still they account for a substantial share of aggregate revenues in the regime.

At first sight, this behavior might seem inconsistent with any profit maximization by businesses - over 60 percent of taxpayers in the TOT regime could be exempt, and still we observe them filing and paying TOT monthly. We perform several exercises to further investigate this behavior. First, one possible explanation is uncertainty about future revenue coupled with partial filing - if many taxpayers only file in some months of the year and their revenue fluctuates a lot, one might decide to file under the belief

that yearly turnover might exceed the exemption threshold, even if ex-post it does not in fact exceed it.[14] Our results suggest that this is unlikely. In Figure 6 we show that even when conditioning on taxpayers filing 12 months (balanced sample), 25%-30% of taxes due are from firms that fall under the exemption threshold. Alternatively, if we only consider partial filers and annualize their revenues, we still observe that 81% would have been under the threshold. Both of these facts are also consistent with what we observe in the full distribution of turnover (Figure 7). Most taxpayers that are under the exemption threshold are not simply slightly under that level – in 2022, for example, 48% had annual turnover below Ksh. 500,000, less than half the exemption threshold. It is unlikely that partial filing or uncertainty over yearly turnover would encourage these taxpayers to file and pay.

An alternative explanation is lack of knowledge: taxpayers might be unaware of the exemption threshold, for example, believing that businesses with any amount of income are liable for the TOT. This explanation is supported by the results of both surveys. The in-person survey showed that only 4.1 percent of registered businesses could correctly identify the minimum threshold for TOT. The SMS survey showed that only 13.7 percent of TOT payers correctly identified the minimum threshold, and almost half stated there was no minimum threshold.

Another possible mechanism to explain the fact that so many taxpayers are paying TOT despite being below the exemption threshold relates to the costs of proving their exemption status. Taxpayers might be aware of the exemption rules and know (or strongly believe) their revenue is low enough to be exempt, but since they often do not have bookkeeping, they may perceive that it will be hard to convince the KRA of this. If not filing/paying TOT led to hassle costs, such as the need to justify their behavior to tax officers or appeal fines, taxpayers might be better off filing TOT and avoiding those costs. Note that a complementary explanation is that many of the taxpayers

[14]The Kenyan Revenue Authority has no automatic check on the total amount of turnover declared to exempt businesses with little revenue. This is partially driven by the fact that declarations are due monthly while the relevant exemption threshold refers to annual revenues, so even very little turnover in a single month might end up summing to a yearly turnover above the threshold if revenues are high enough in other periods.

who declare low revenue might be under-declaring their true turnover, which could be higher in reality. But to justify still filing and paying TOT, they must have some belief that this is better than simply not declaring because the turnover they would declare makes them exempt. Either way, this pattern of behavior is consistent with the formalization of "nuisance taxes" (Dom et al. 2022), whereby businesses just pay something to avoid enforcement challenges with the KRA.

4.1.2 Size of tax obligations

Secondly, efforts to mobilize revenue by increasing the size of tax obligations required from small businesses are substantially offset by them lowering their declared turnover. As previously discussed, the details of the TOT regime in Kenya have changed several times in recent years. In this subsection, we focus on one of these changes and provide suggestive evidence that taxpayers reduce their reported turnover when the TOT rate increases. Our focus is on the TOT reform of July 2023, when the tax rate increased threefold, from 1% of turnover to 3%.

First, we document in Figure 8 that the total amount of tax obligations increased substantially following the reform, as expected. In the first half of 2023 the monthly aggregate TOT paid was stable around Ksh. 12 million. Immediately after the reform, in July 2023, the total TOT paid increased to approximately Ksh. 28 million, around 2.3 times larger than the previous month. That amount was stable in August and then increases until the end of the year as the number of registered TOT taxpayers expands.

If the tax rate tripled, why did the tax revenue increase less than proportionally? The answer is that taxpayers, immediately after the reform, started to declare less turnover. In Figure 9, we show that the aggregate declared turnover was Ksh. 1.1 - 1.2 billion in the months before the reform, and it suddenly drops by 25% to Ksh. 900 million in the July-August period. In the figure, we show similar monthly trends for previous years and document that this is unlikely to be a seasonal effect or any other regular shock – in no other months in the period 2020-2023 do we observe such a notable decline in aggregate turnover, which are overall very stable across months

(with the exception of a yearly seasonal uptick in December).

To investigate the robustness of these results further, we ask whether these aggregate results are replicated at the business level- as the previous results could simply be driven by changes in the composition of businesses.[15] We proceed by first taking a balanced sample of businesses that filed every month in 2022 and 2023 and run a regression of the following form:

$$Log(Turnover)_{imy} = \gamma_i + \sum_{m=1}^{12} \beta_{my} Month_m * Year_y + \epsilon_{imy} \quad (1)$$

where γ_i are taxpayer's fixed effects and our coefficients of interest are β_{my}, which provide the differential average log turnover declaration in the year 2023 for each month, compared to the year 2022.

We present the coefficients of interest in Figure 10. We first note that, taking June as a reference, there were no large differences in log turnover in each of the first five months of 2023 compared to 2022 (some coefficients are statistically significant but very small in magnitude). Immediately after the reform, we see a remarkable divergence: declared turnover in July 2023 is more than 30% lower than in the same month of 2022. Furthermore, when we restrict ourselves to the balanced sample and exclude the new entrants in late 2023, our results suggest that existing businesses consistently declared lower revenues compared to the previous year – in December 2023, declared turnover at the business level was more than 40% lower on average. In the Appendix (Figure A.2), we also show that while the immediate fall in declared turnover was very similar for firms declaring turnover below or above the median before the reform, by the end of 2023 this reduction is more pronounced for larger firms.

It is important to note the limitations of this analysis. Given the nature of the reform affecting all businesses in the TOT regime, this is a pre-post analysis, taking the previous year as a reference to rule out seasonal effects, which means that another contemporaneous shock that affected the economy simultaneously would be captured by

[15] We note that we do not see a relevant extensive margin response, with fewer businesses filing TOT after the reform, as can be seen in Figure 3.

our regressions. Nonetheless, we do not see evidence of such a shock when looking at VAT collection (refer to Appendix Figure A.3) – no large changes in tax collected are observed around the same period we see the significant increase in TOT taxes, suggesting that the response we document is much more likely to be an evasion response than a real economic shock. Over time, it is possible that the higher TOT rate may have real economic implications as businesses have fewer resources to reinvest in their operations.

The responsiveness of taxpayers to a change in tax obligations is consistent with findings from the surveys showing that respondents were relatively better informed about the TOT rate they needed to pay compared to other aspects of the TOT regime. Specifically, 44.6 percent of registered small businesses in the in-person survey and 31.8 percent of TOT payers in the SMS survey were aware of the existing TOT rate. The lower level of knowledge in the SMS survey may be a result of the tax rate changes in the preceding 12-month period.

4.1.3 Requiring a percentage to be paid

Thirdly, requiring taxpayers to calculate a percentage of their monthly turnover to be paid in tax appears to be challenging for some businesses, especially those that do not have extensive transaction records. Instead, it appears many small businesses rely on heuristics to determine their tax liability, as a non-trivial share consistently pays the same amount in TOT each month despite numerous policy changes altering their tax liability up and down (see Table 2).

Both surveys reveal that registered small businesses struggle to calculate percentages of turnover. The in-person survey shows that just over half (53.5 percent) of registered small businesses could calculate 1 percent of 5 million Kenyan shillings. The SMS survey illustrated that just over two-thirds (68.9 percent) of TOT payers who responded to the survey could calculate the tax obligation required from businesses earning 5 million Kenyan shillings.[16]

[16]In the case of the SMS survey respondents were not informed of the actual rate of TOT while in the in-person survey they were informed prior to this question. As such, in the case of the SMS survey, the

4.2 Randomized Experiment

4.2.1 Design of the experiment

In light of the challenges with the current TOT regime, we tested an alternative design that aims to better balance the trade-offs inherent in these types of regimes. This alternative design involves trying to make compliance much easier by encouraging small businesses to pay a set fee in TOT based on their business type[17] and location. The set fee was the equivalent of the amount of TOT that the average business with these characteristics was expected to pay under the existing TOT regime based on previous filing behavior. This means that if compliance were identical, then the alternative and the existing regime would yield the same amount in revenue. The alternative design is more equitable than one set fee being required by all small businesses across the country, as there is much less variation in turnover among small businesses within the same location and business type. However, in theory, this approach is less equitable than each business calculating a percentage of its own turnover as smaller businesses will be encouraged to pay a higher effective tax rate (and larger businesses will be encouraged to pay a lower one). In practice, it is not clear how taxpayers will respond to this encouragement. On balance, this alternative design could potentially be desirable given the extensive issues with the current approach discussed throughout the preceding sections of this paper.

To test the alternative design of the STR, we randomly selected over 10,000 TOT payers[18] among the universe of TOT payers who had filed at least once in the proceeding 24 months. The selected TOT payers were randomly allocated[19] into either a control group, a placebo group (that just received a reminder about the existing regime), or a treatment group where businesses were encouraged to pay a set fee in TOT customized by their business type and location (referred to as the "Anchor" treatment).

calculation is based on what respondents think the rate of TOT is, as opposed to what it actually is.

[17]Business type was defined as whether taxpayers were registered as individuals or companies. Unfortunately, it was not possible to further categorize taxpayers as there were substantial missing values for other characteristics such as industry or occupation.

[18]To avoid potentially negatively impacting tax collection, we excluded the top 10 percent largest businesses in terms of turnover from the experiment.

[19]Randomization was stratified by tax region, business type, and past taxpaying behavior.

Since by law taxpayers cannot simply be randomly allocated to different tax regimes, we instead proxy for this by encouraging taxpayers to pay a set fee based on their characteristics.

Taxpayers in the treatment and placebo group received multiple SMS messages from the KRA in the lead-up to the 20th of April 2024 filing date for the TOT regime (see examples of these messages in Appendix Figure A.4). Prior to the full field experiment, there were several rounds of piloting and extensive discussions with the KRA Marketing and Communication team about the exact wording of each SMS message. While the KRA requires a phone number for all registered taxpayers, many are invalid or have opted-out from receiving "broadcast" SMS messages. As a result, only around 60 percent of the taxpayers who were intended to be contacted via SMS message were actually reached. Therefore, we examine the treatment-on-treated effects as well as the intent-to-treat effects in the following subsection. We show that, at least in the observable characteristics we have access to, businesses that received SMS messages were similar to those to which SMS message could not be delivered (Table A.3). We also provide a balance table across treatment and control groups (Table A.2). While we do not have access to a wide range of characteristics for businesses in the experiment, we show that these taxpayers were very similar across a range of indicators in the control groups and the two different treatment statuses.

4.2.2 Results of the experiment

Panel A in Table 3 shows that, on average, taxpayers randomly allocated to the alternative design of the TOT regime (the anchor treatment) paid a much larger amount of tax, and this treatment slightly increased the share of taxpayers who filed. The intent to treat effect from the anchor treatment was a 11.7 percent increase in total payment amounts and the treatment on treated effect was 19.8 percent. In this instance, given it is a cross-sectional randomized experiment and the large share of SMS messages that were never delivered, it is appropriate to focus on the treatment on treated effects. The point estimate of the anchor treatment outperformed the simple reminder treatment

(p-value difference in treatment on treated effects was 0.099), but we cannot entirely rule out the fact that TOT payers receiving a message from the KRA was partly driving the effect.[20]

Panels B and C in Table 3 show that the sizable effects on the amount of tax paid were almost exclusively driven by taxpayers below the median of the distribution of the previous months' tax payment amounts. For example, the treatment on the treated effect from the anchor treatment was a 37.5 percent increase among TOT payers below the median whereas the effect was insignificant and only 6.8 percent increase among those at the median and above (refer to the Appendix for more details). TOT payers below the median were more likely to respond to both the reminder and the anchor treatment. However, the effect of the latter was larger (these differences are not statistically significant at conventional levels, partly due to a smaller sample size reducing power). These results illustrate how, by attempting to improve the simplicity of the tax-paying process, only smaller taxpayers ultimately paid more tax.

5 Discussion and Conclusion

This paper has illustrated several challenges with designing STRs for small businesses that aim to achieve the objectives of revenue collection, simplicity, and maintaining equity while minimizing real distortions. We show how there is considerable variation in the *de jure* features of how small businesses are taxed across Sub-Saharan Africa regarding eligibility thresholds, whether tax is paid as a set fee or a percentage of turnover, and the relative size of tax obligations. We draw on the example of the TOT regime in Kenya to highlight several *de facto* aspects of these regimes including showing that minimum thresholds are not binding in practice, that responses to changes in taxation can contribute to inequality, and efforts to simplify the process only increased

[20]One natural question is whether, in response to the specific figure we suggested as an anchor for payment, businesses declared that exact same value. We investigate that possibility and show that behavior is somewhat limited (Figure A.6). Only approximately 2% of businesses in the anchor arm declared tax liabilities identical to the anchor. The histogram shows the "excess mass" around the amount in the anchor treatment, but the effect is quite muted.

tax payments made by smaller taxpayers. Collectively, these findings illustrate that there are binding trade-offs that policy makers must directly confront when designing and administering these regimes.

This study raises the question of whether it is worth it for governments in Sub-Saharan Africa to direct substantial resources towards the taxation of small businesses. There has been an extensive normative discussion in the literature about whether governments should focus on small business taxation, especially given many, if not most, of these taxpayers likely live below the national poverty line (e.g., see Moore (2023)). This study demonstrates that even if governments were determined to tax small businesses, they would most likely not be able to do it in a way that adequately meets their objectives. This is particularly clear when examining the trade-off between having a simple tax regime that is easy to comply with (e.g., a set fee) compared to a more vertically equitable but complex approach (e.g., requiring a percentage of business turnover be paid). Furthermore, improving taxpayer knowledge about the characteristics of STRs is likely to ensure that they are implemented more in line with the country's tax legislation, but this may not always be in the interest of the revenue authority.

Several areas for future research emerge from this study. Firstly, an analysis of tax administrative data in other Sub-Saharan African countries could be done to examine the *de facto* implementation of STRs. Secondly, further experimental work could be conducted to thoroughly examine trade-offs along the simplicity–equity margin to help inform optimal tax policy design. Thirdly, stocktakes of countries' tax legislation could be conducted covering other types of taxes and/or other regions of the world to help shed light on variations in *de jure* attributes of tax systems.

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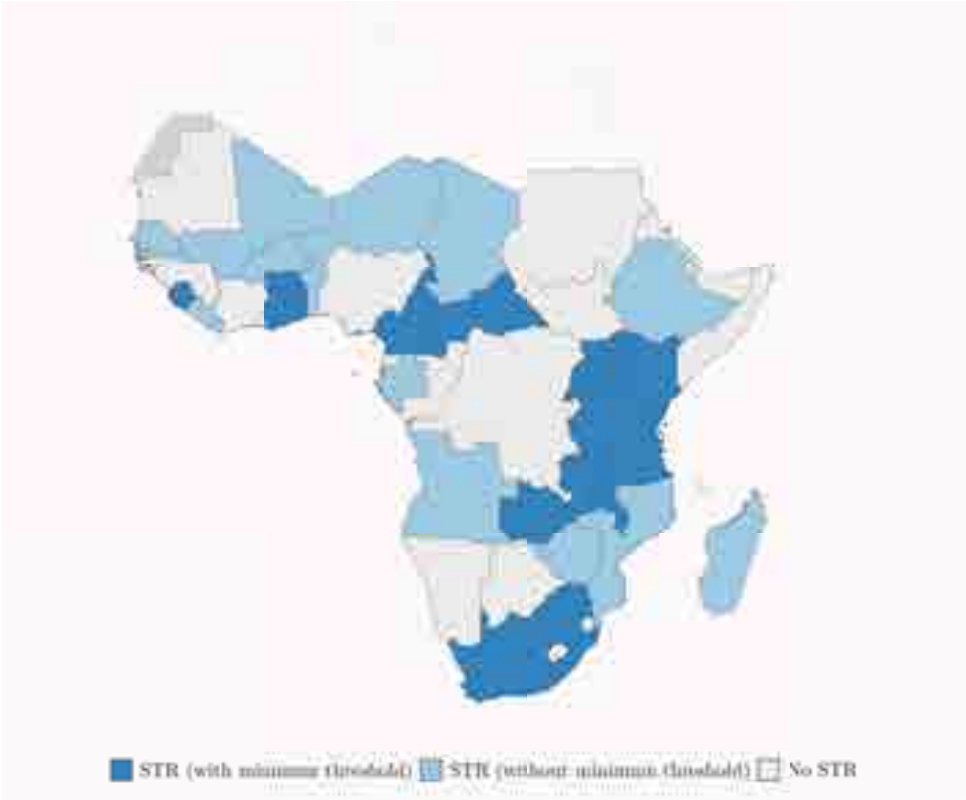
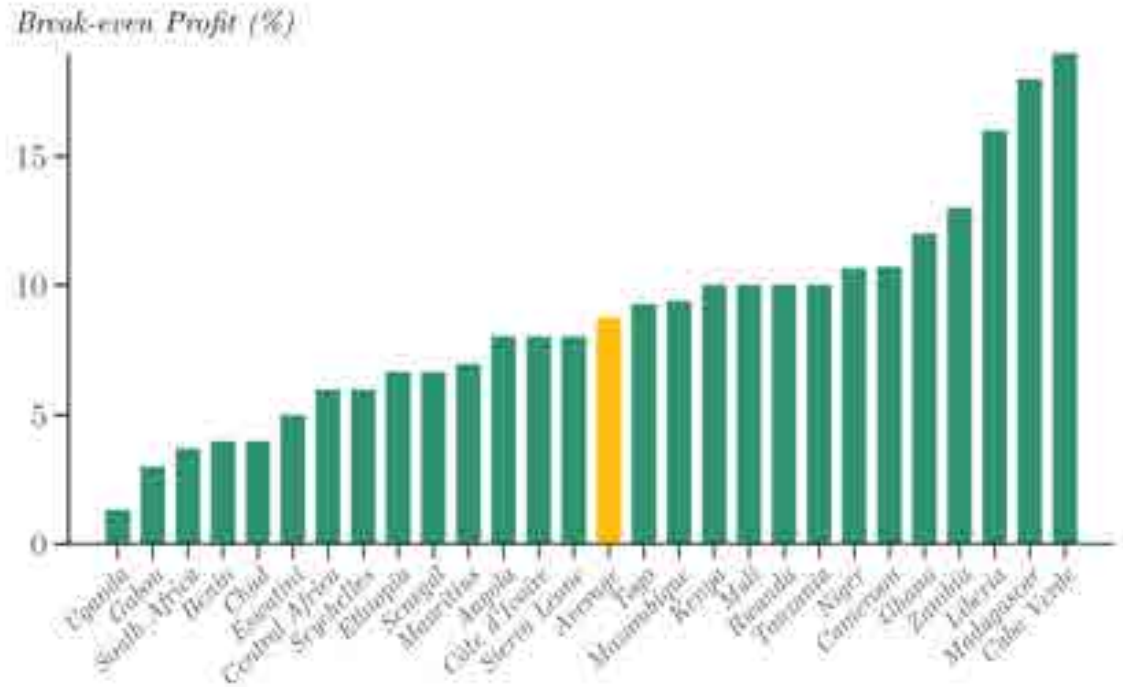
6 Figures and Tables

Figure 1: Spatial Distribution of Simplified Tax Regimes in Sub-Saharan Africa



Note: This map illustrates the distribution of Simplified Tax Regimes (STRs) across Sub-Saharan African countries as of March 2024.

Figure 2: Profit Rate (%) for Equal Tax Liability Under Profit and Turnover Regimes, by Country



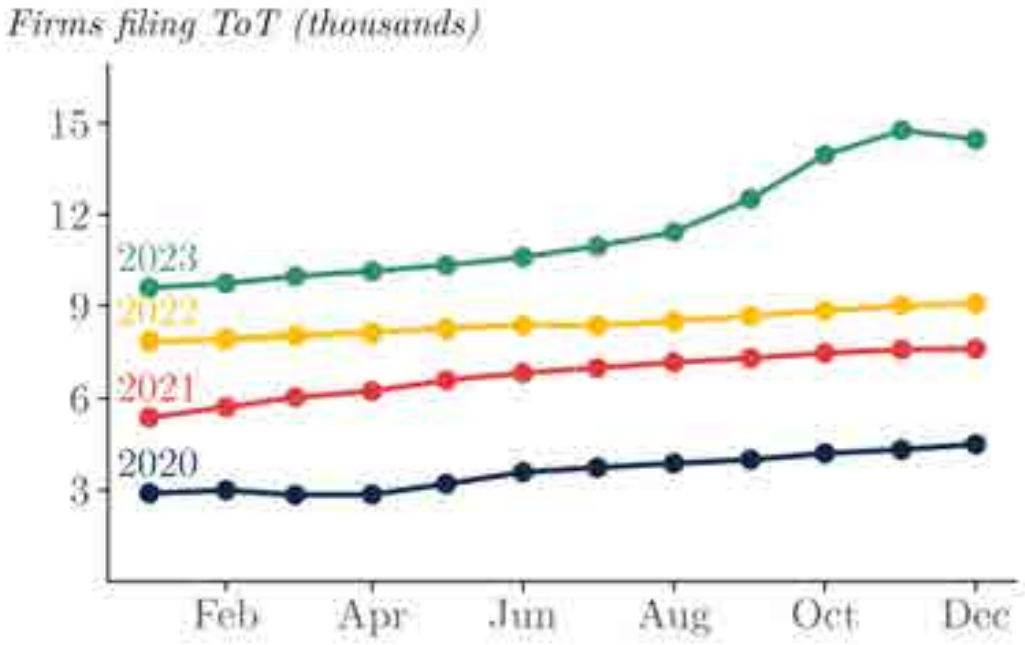
Note: This graph reports the profit rate percentages that equalize the tax burden for businesses under both profit and turnover tax regimes across various African countries. Each bar represents the specific profit rate at which a business's tax liability under a profit tax regime would be equivalent to its tax liability under a turnover tax regime within that country. The "Average" bar indicates the overall average profit rate percentage across all the included countries.

Table 1: Sample: Descriptive Statistics

	2016	2018	2020	2023
Aggregates				
N of Firms	6,590	6,819	5,673	17,791
Total Turnover (*KSh* in *millions*)	3,038	3,166	3,074	13,317
Tax Due (*KSh* in *millions*)	87	93	37	261
Total Payments (*KSh* in *millions*)	101	101	53	246
Medians				
Total Turnover (*KSh*)	84,255	79,510	43,543	49,500
Tax Due (*KSh*)	2,400	2,264	500	900
Total Payment (*KSh*)	2,715	2,573	816	1,000
Firm Characteristics				
Shr of Individuals	1	1	1.00	0.96
Shr in Nairobi	0.20	0.17	0.13	0.14
Shr in Nyeri	0.16	0.15	0.05	0.08
Shr in Mombasa	0.08	0.07	0.14	0.08
Shr in Meru	0.06	0.06	0.07	0.07
Shr in Eldoret	0.03	0.04	0.07	0.08
Shr in Nakuru	0.03	0.02	0.04	0.09

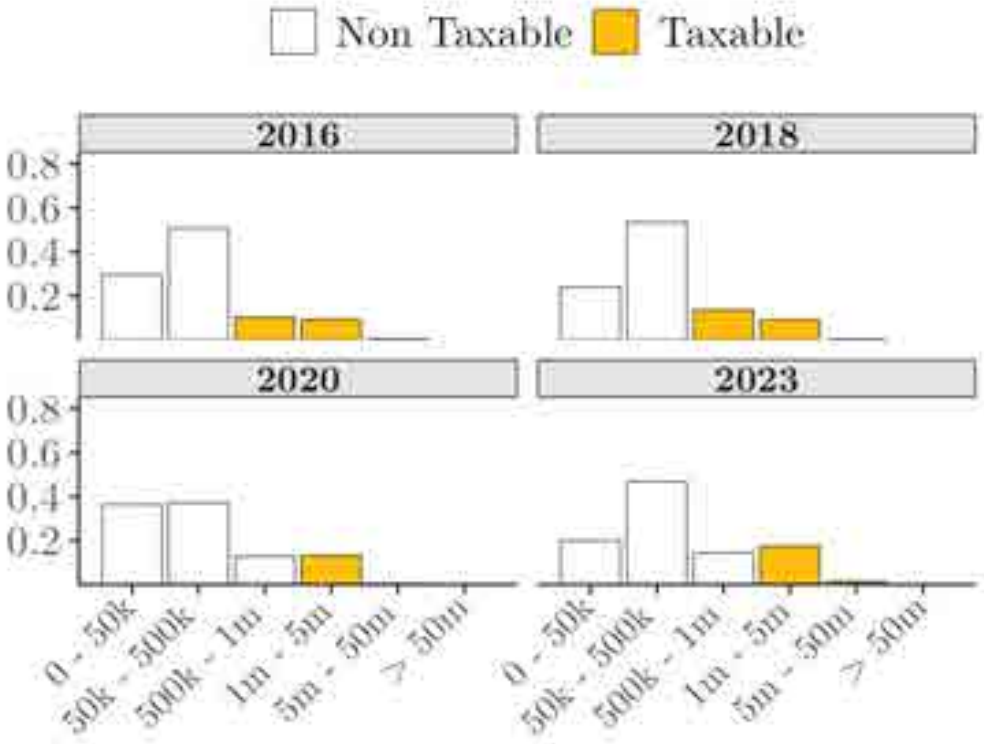
Note: This table presents descriptive statistics for the sample of individuals and non-individuals that filed or paid Turnover Tax (ToT) in Kenya from 2016 to 2023. Total Turnover refers to the self-declared amount at the time of declaration, which forms the basis for calculating Tax Due. Payments reflect the total amount paid for ToT. The table also outlines the geographic distribution of taxpayers across the six largest cities in Kenya. These discrepancies can be attributed to two main factors: (a) payments include additional fees beyond the due taxes, such as late payment fees, and (b) the introduction of the KRA M-Service app allows for direct payments without the need to file through the traditional TOTs regime.

Figure 3: Total Number of Filers by Month



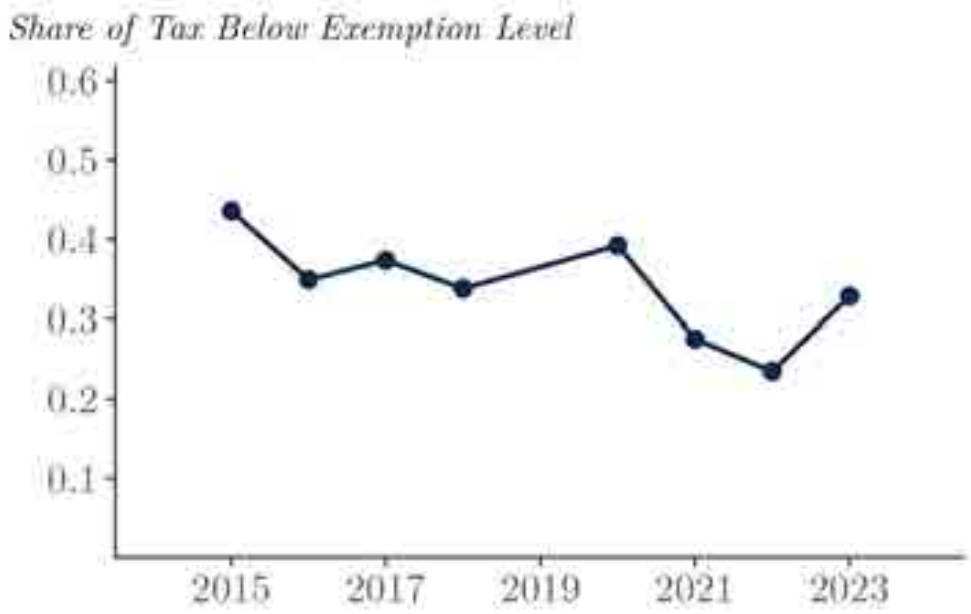
Note: This figure displays the monthly number of taxpayers filing Turnover Tax (ToT) from 2020 to 2023. All figures are expressed in thousands.

Figure 4: Distribution of Turnover over Brackets (2016, 2018, 2020, 2023)



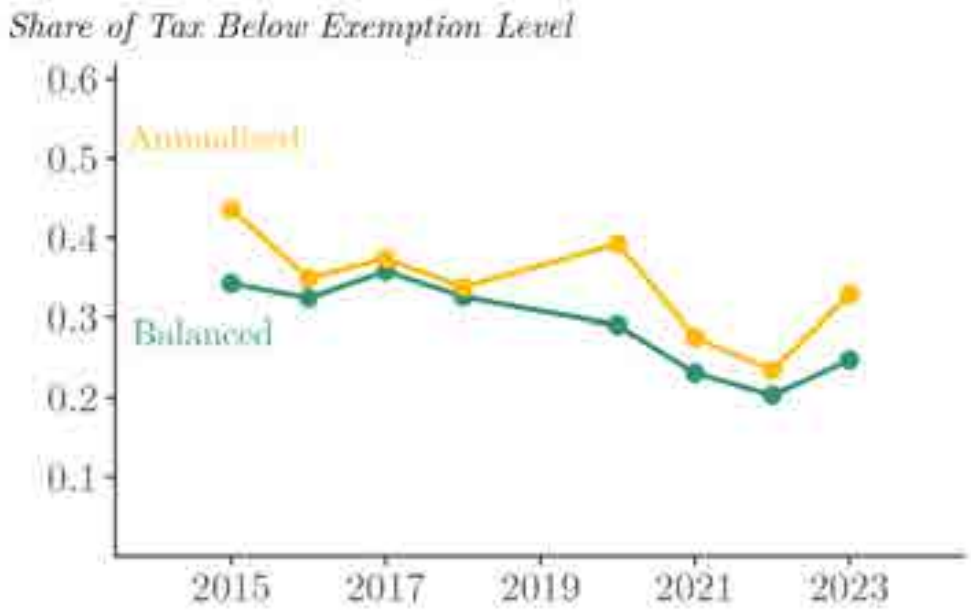
Note: This figure displays the distribution of turnover across six brackets. Highlighted bars represent intervals exceeding the exemption threshold for filing and paying Turnover Tax (ToT).

Figure 5: Share of Taxes Due by businesses Below the Exemption Threshold by Year



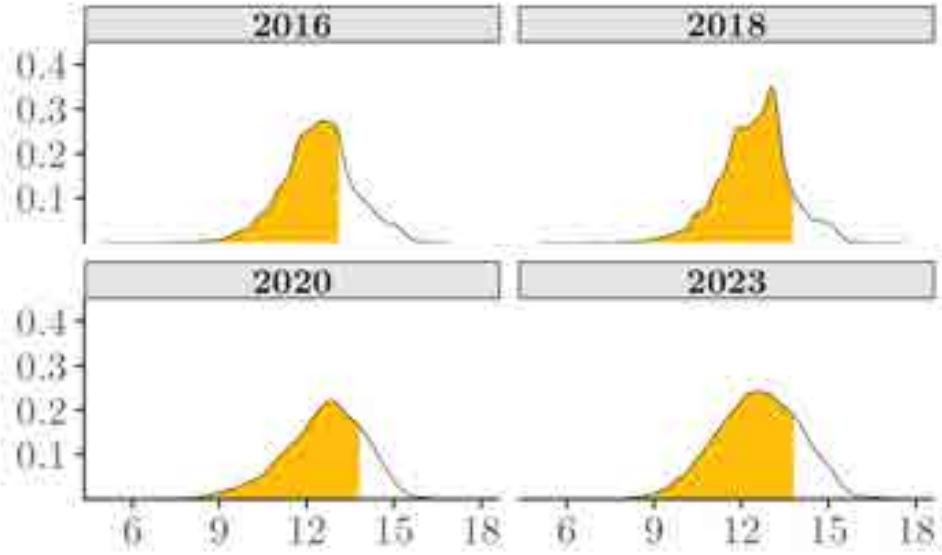
Note: This figure illustrates the trend in the percentage of total tax liabilities owed by businesses with revenues below the exemption threshold, over time. It calculates the annual total tax liabilities and presents the proportion attributable to businesses under the exemption limit as a percentage of the overall tax due.

Figure 6: Share of Taxes Due by businesses Below the Exemption Threshold by Year - Balanced vs Annualized Sample



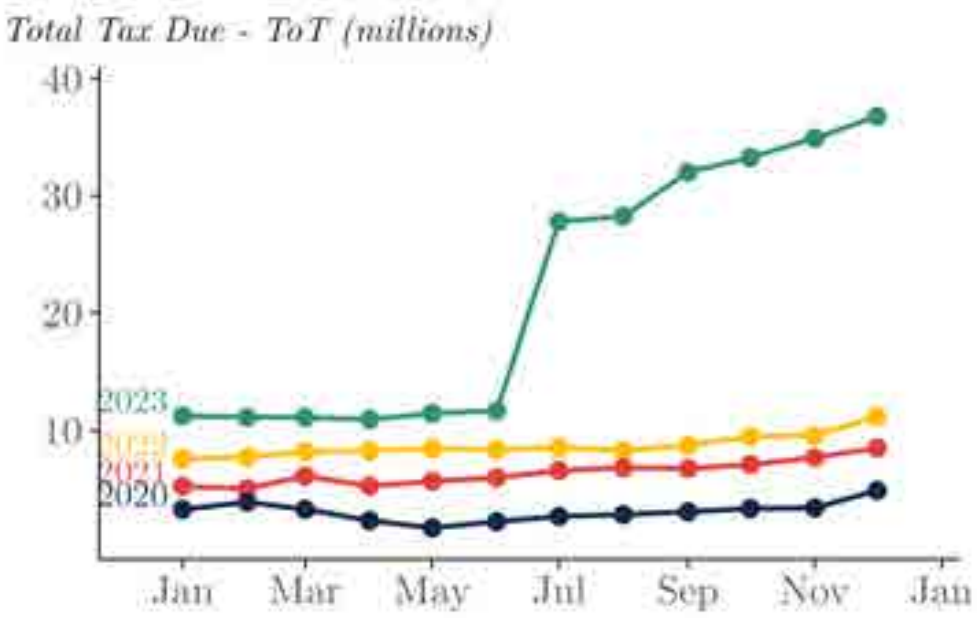
Note: This figure illustrates the trend in the percentage of total tax liabilities owed by businesses with revenues below the exemption threshold, from 2015 to 2023. It calculates the annual total tax liabilities and presents the proportion attributable to businesses under the exemption limit as a percentage of the overall tax due. The 'Balanced Sample' represents entities that filed returns every month within a year, whereas the 'Annualized Sample' includes entities that filed for less than 12 months, with sales figures projected to reflect an annual estimate.

Figure 7: Density Distribution of Log-Transformed Total Turnover (2016, 2018, 2020, 2023)



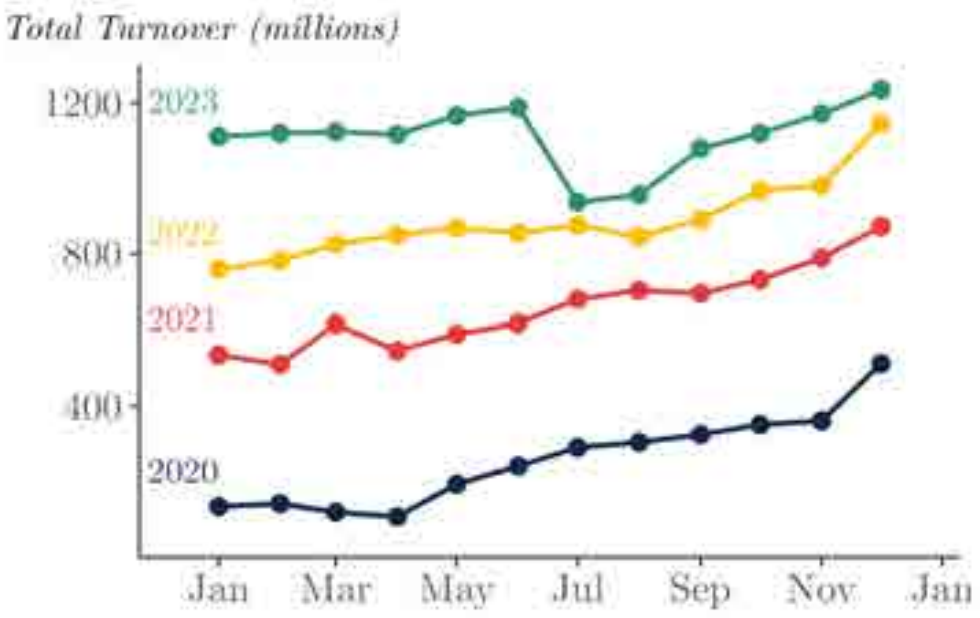
Note: This figure depicts the density distribution of log-transformed turnover across different years. Areas highlighted under the curve represent the proportion of businesses whose turnover falls below the exemption thresholds, which were set at 500,000 Ksh in 2016 and increased to 1,000,000 Ksh in 2018, 2020, and 2023.

Figure 8: Total Net Tax by Month



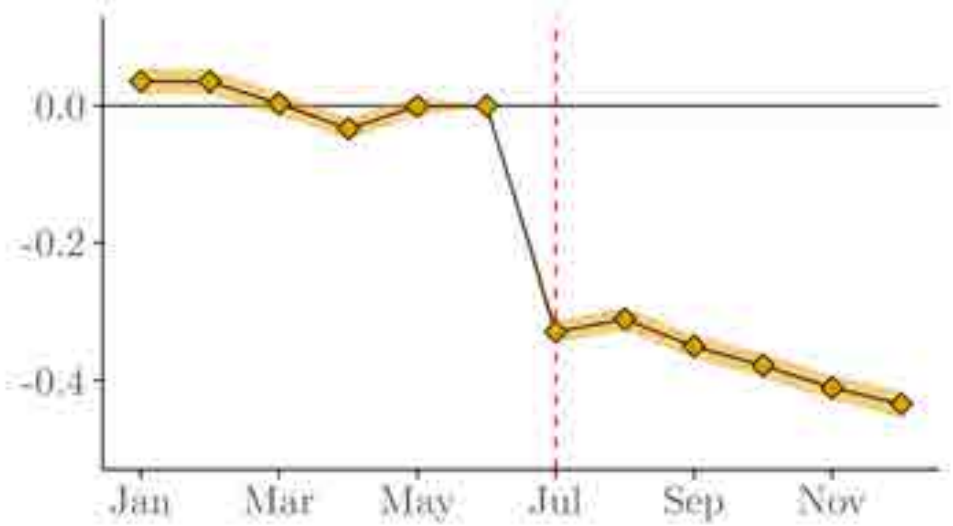
Note: This figure displays the monthly tax liabilities for Turnover Tax (ToT) from 2020 to 2023. All figures are expressed in millions.

Figure 9: Total Turnover Declared by Month



Note: This figure displays the monthly turnover declared by businesses filing for Turnover Tax (ToT) from 2020 to 2023. All figures are expressed in millions.

Figure 10: Regression coefficients - change in turnover after rate reform



Note: This figure illustrates the coefficients obtained from an OLS estimation, where the outcome of interest is the log-transformed value of the self-declared turnover. Firm fixed effects are included. Robust standard errors, clustered at the firm level, are used; the confidence intervals displayed are at the 95% level."

Table 2: Share of businesses/Declarations with the Same/Similar Declared Turnover

	Share of TOT declarations with		Share of Firms declaring	
	Same Turnover	Turnover within ±5%	Same Turnover	Turnover within ±5%
2016	6.56%	29.6%	3.67%	12.1%
2017	7.49%	29.1%	3.36%	10.2%
2018	8.58%	30.3%	4.04%	10%
2020	10.6%	23%	3.03%	4%
2021	15.6%	30.9%	6.45%	7.45%
2022	16.1%	32.2%	5.85%	6.96%

Note: This table displays the proportion of declarations with consistent turnover for each year and the proportion of businesses that consistently report the same turnover annually.

Table 3: Experimental Findings: Main Estimates

		$\mathbb{1}\{Payments > 0\}$		*Log*(Payments)	
		OLS	*IV*	*OLS*	*IV*
Panel A: Whole Sample					
Any Treatment	$\hat{\beta}$	0.009	0.015	0.065	0.112
	se	(0.01)	(0.01)	(0.06)	(0.1)
	p-value	0.289	0.289	0.287	0.287
Reminder	$\hat{\beta}$	0	0.001	-0.012	-0.021
	se	(0.01)	(0.02)	(0.08)	(0.13)
	p-value	0.966	0.966	0.872	0.872
Anchor	$\hat{\beta}$	0.014	0.024	0.117*	0.199*
	se	(0.01)	(0.02)	(0.07)	(0.12)
	p-value	0.12	0.12	0.087	0.087
p-value (Reminder vs Anchor)		0.182	0.187	0.094	0.096
Control Mean		0.620	0.620	4.571	4.571
Observations		10,397	10,397	10,397	10,397
Panel B: Below Median					
Any Treatment	$\hat{\beta}$	0.024**	0.042**	0.194**	0.34**
	se	(0.01)	(0.02)	(0.08)	(0.14)
	p-value	0.049	0.049	0.019	0.019
Reminder	$\hat{\beta}$	0.02	0.034	0.162	0.286
	se	(0.02)	(0.03)	(0.1)	(0.18)
	p-value	0.198	0.197	0.119	0.119
Anchor	$\hat{\beta}$	0.027**	0.046**	0.216**	0.375**
	se	(0.01)	(0.02)	(0.09)	(0.16)
	p-value	0.049	0.048	0.02	0.02
p-value (Reminder vs Anchor)		0.644	0.660	0.612	0.631
Control Mean		0.429	0.429	2.798	2.798
Observations		4,635	4,635	4,635	4,635
Panel C: Median and Above					
Any Treatment	$\hat{\beta}$	-0.004	-0.007	-0.035	-0.059
	se	(0.01)	(0.02)	(0.09)	(0.15)
	p-value	0.729	0.729	0.69	0.69
Reminder	$\hat{\beta}$	-0.016	-0.026	-0.149	-0.253
	se	(0.01)	(0.02)	(0.11)	(0.19)
	p-value	0.274	0.274	0.179	0.179
Anchor	$\hat{\beta}$	0.004	0.007	0.041	0.069
	se	(0.01)	(0.02)	(0.1)	(0.16)
	p-value	0.754	0.754	0.673	0.673
p-value (Reminder vs Anchor)		0.085	0.085	0.169	0.168
Control Mean		0.774	0.774	6.002	6.002
Observations		5,762	5,762	5,762	5,762

Heteroskedasticity-robust standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

This table reports the main estimates for the Intention To Treat (ITT), using the Ordinary Least Square estimator (OLS), and the Local Average Treatment Effect (LATE), using Instrumental Variables (IV). The outcomes of interest are a dummy variable indicating whether the payment was effectively made and the log of the amount effectively paid. The estimates are presented separately for the Reminder and Anchor treatment arms, as well as for Any Treatment, which pools both treatment arms together. The estimates are provided for the entire sample and for subgroups below and above the median. The instrument used for the IV regression is the actual delivery of the message. The control variables include the average amount paid at baseline, the average amount paid within the region (strata), a dummy variable indicating consistent monthly filing, a dummy variable for non-filing in 2023, and a dummy variable for taxpayers who registered in 2023. Standard errors are robust. The table also includes p-values for each estimate and p-values for t-tests evaluating differences across samples.

A Appendix

A.1 Details of Simplified Tax Regimes across Sub-Saharan Africa

Table A.1: Overview of Simplified Tax Regimes Across Sub-Saharan Africa

Country	Minimum Threshold (USD)	Proportional	Differentiated	Progressive	Set Fee (USD)	Corporate Tax Rate
Angola			2 - 13.5%		Varies based on sector/area	25%
Benin		2%			16	22.5%
Burkina Faso					16 - 330	27.5%
Cabo Verde		4%				21.42%
Cameroon	16,500		3.3 - 5.5%		Varies by import status	30.8%
Central African Republic	3,060	1.85%			Varies	30%
Chad		1.5%				35%
Eswatini	16,399	1.5%				27.5%
Ethiopia				2 - 10%	Varies*	30%
Gabon		1%				30%
Ghana	1,676	3%				25%
Cote d'Ivoire				2 - 25%		25%
Kenya	6,402	3%				30%
Liberia		4%				25%
Madagascar		3.5%			3.6 - 33.8	20%
Malawi	2,356				96 - 196	30%
Mali		3%				30%
Mauritius		1%				15%
Mozambique				3 - 10%	1174	32%
Niger			3 - 10%		Varies by sector	30%
Rwanda	1,520	3%			52 - 260	30%
Senegal			2 - 5%		Varies by sector	30%
Seychelles		1.5%				25%
Sierra Leone	439			2 - 6%	5 - 397*	25%
South Africa	18,282			1 - 1.42%		27%
São Tomé and Príncipe			20 - 25%			26%
Tanzania	1,588			3 - 3.5%	41 - 186**	30%
Togo	33		2.5- 8%		Varies by sector	27%
Uganda	2,650			0.4 - 0.7%	21 - 242**	30%
Zambia	24	4%				30%
Zimbabwe					Varies by sector	24.72%

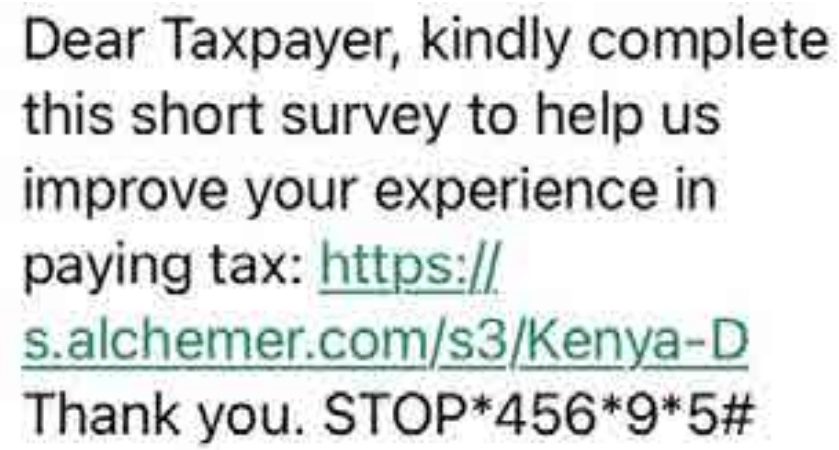
Note:

* Set fee at lower levels of turnover, percentage otherwise

** Set fee if no records, percentage otherwise

A.2 Survey of TOT payers

Figure A.1: SMS message inviting taxpayers to participate in the survey



Note: This figure presents an example of the SMS sent to taxpayers to invite them to participate in the survey.

Questions and findings from TOT payers survey

What is the lowest annual income firms must make to be required to pay turnover tax?

	Share of respondents
There is no minimum amount	43.8%
K Sh 100,000	16.0%
K Sh 500,000	11.8%
K Sh 1,000,000	13.7%
K Sh 5,000,000	14.7%

What percentage of income do you think firms are required to pay in turnover tax?

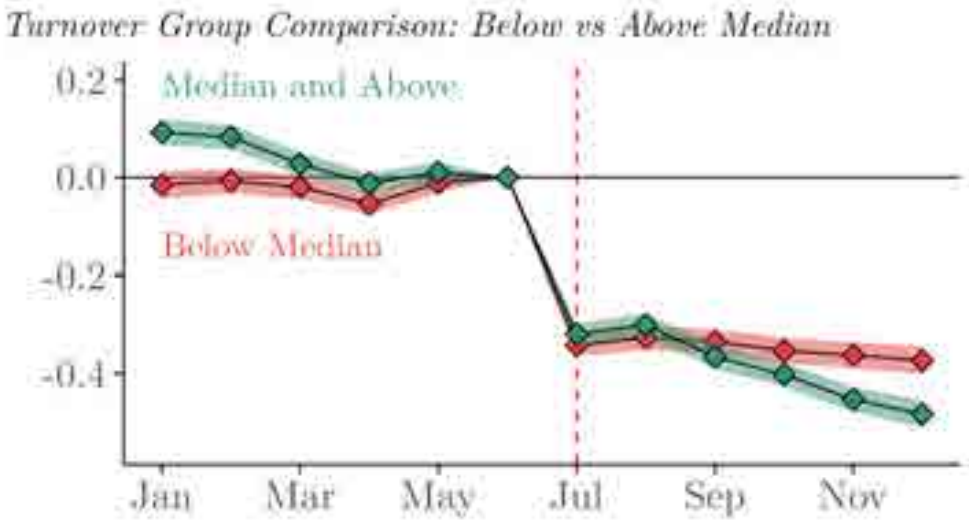
	Share of respondents
1%	40.7%
1.5%	31.8%
2%	2.9%
3%	23.3%
5%	1.4%

If a firm makes K Sh 5,000,000 of income in a year, how much turnover tax do they have to pay that year?

	Share of respondents
K Sh 0	9.3%
K Sh 50,000	42.3%
K Sh 75,000	20.3%
K Sh 100,000	3.7%
K Sh 150,000	24.5%

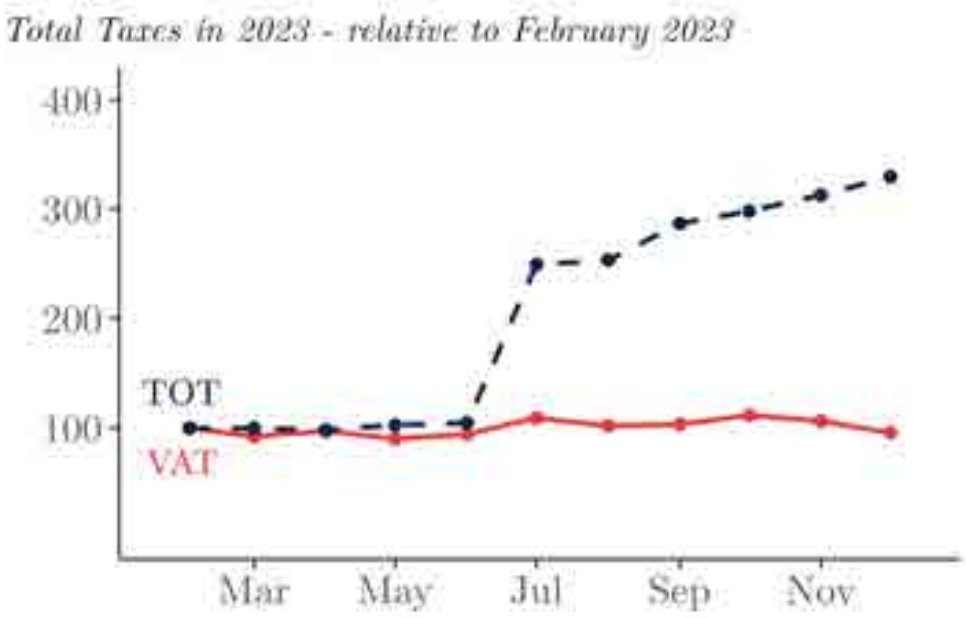
A.3 Additional findings from tax administrative data

Figure A.2: Heterogeneity: Regression coefficients - change in turnover after rate reform, Below and Above Median



Note: This figure illustrates the coefficients obtained from an OLS estimation, where the outcome of interest is the log-transformed value of the self-declared turnover. Firm fixed effects are included in the model. The estimations are run separately for taxpayers who declared their average turnover in the 12 months before the reform as either above or below the median. Robust standard errors, clustered at the firm level, are used. The confidence intervals displayed are at the 95% level."

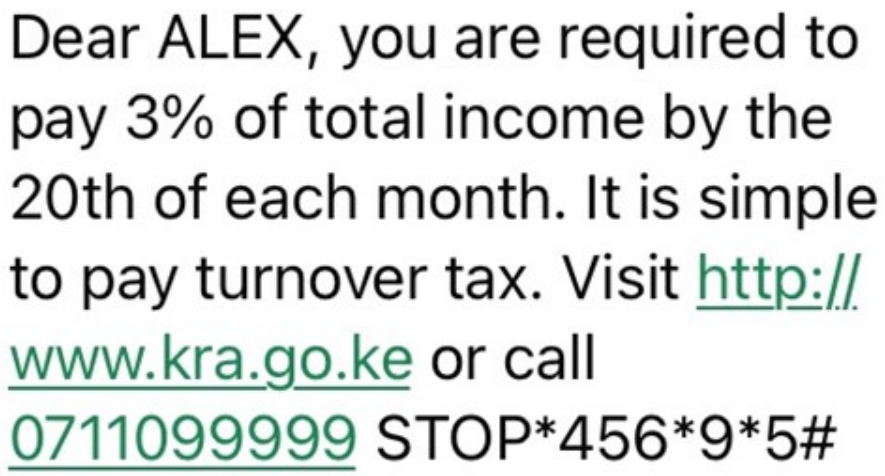
Figure A.3: Trends in Revenue Collections for 2023 (ToT vs VAT)



Note: This figure depicts the monthly trends in total revenue collections and Value-Added Tax (VAT) collections throughout 2023, each indexed to their levels in February 2023, which is normalized to 100. The dashed blue line represents the TOT collections, and the solid red line indicates VAT collections."

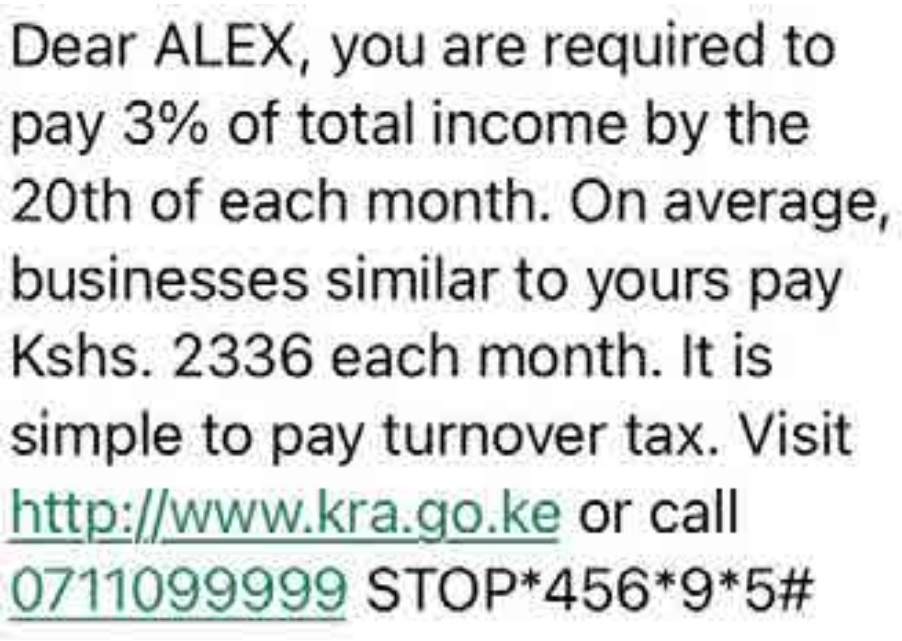
A.4 Examples of Reminder and Anchor SMS Messages

Figure A.4: Example of the Reminder treatment SMS message



Note: This figure shows an example of the Reminder treatment SMS message

Figure A.5: Example of the Anchor treatment SMS message



Note: This figure shows an example of the Anchor treatment SMS message

Table A.2: Balance Table Across Treatment and Control Groups

	(1) Control	(2) Any Treatment	(3) Anchor	(4) Reminder	Difference (1) - (2)	Difference (1) - (3)	Difference (1) - (4)	Difference (3) - (4)
Panel A: Whole Sample								
Avg ToT Paid, 2023	1269.147	1265.507	1263.649	1268.294	3.64	0.853	5.499	4.645
	[22.789]	[17.526]	[22.676]	[27.624]				
Zero Filing, 2023	0.056	0.05	0.05	0.05	0.006	0.006	0.006	-0.001
	[0.004]	[0.003]	[0.003]	[0.004]				
N of Months since registration	21.923	21.241	21.099	21.454	0.682**	0.469	0.824**	0.355
	[0.27]	[0.207]	[0.267]	[0.329]				
ToT Obligation began in 2023	0.428	0.443	0.442	0.445	-0.016	-0.017	-0.015	0.003
	[0.008]	[0.006]	[0.008]	[0.01]				
N of Filings	12.459	12.231	12.172	12.319	0.228	0.14	0.287	0.147
	[0.146]	[0.112]	[0.144]	[0.179]				
Observations	3,932	6,554	3,932	2,622				
F-Stat					1.103	0.546	1.544	1.057
Panel A: Below Median								
Avg ToT Paid, 2023	262.013	263.012	261.212	265.729	-1	-3.716	0.801	4.516
	[7.901]	[6.033]	[7.762]	[9.591]				
Zero Filing, 2023	0.125	0.112	0.112	0.111	0.013	0.014	0.013	-0.001
	[0.008]	[0.006]	[0.008]	[0.009]				
N of Months since registration	23.574	22.879	22.769	23.045	0.695	0.528	0.805	0.276
	[0.397]	[0.306]	[0.393]	[0.49]				
ToT Obligation began in 2023	0.364	0.385	0.377	0.396	-0.02	-0.032*	-0.013	0.019
	[0.011]	[0.009]	[0.012]	[0.014]				
N of Filings	11.466	11.205	11.278	11.095	0.261	0.371	0.188	-0.182
	[0.211]	[0.162]	[0.209]	[0.258]				
Observations	1,761	2,930	1,762	1,168				
F-Stat					0.716	1.105	0.859	1.628
Panel A: Median and Above								
Avg ToT Paid, 2023	2086.082	2076.023	2077.609	2073.656	10.058	12.425	8.473	-3.953
	[31.244]	[23.986]	[31.1]	[37.693]				
Zero Filing, 2-23	-	-	-	-	-	-	-	-
	-	-	-	-				
N of Months since registration	20.592	19.926	19.752	20.185	0.666	0.407	0.84	0.432
	[0.366]	[0.279]	[0.36]	[0.441]				
ToT Obligation began in 2023	0.479	0.49	0.495	0.484	-0.012	-0.005	-0.016	-0.011
	[0.011]	[0.008]	[0.011]	[0.013]				
N of Filings	13.265	13.06	12.899	13.302	0.204	-0.037	0.366	0.403
	[0.199]	[0.153]	[0.198]	[0.244]				
Observations	2,171	3,624	2,170	1,454				
F-Stat					0.798	0.826	0.875	0.897

Note: This table shows that the background characteristics of respondents across treatment and control groups are balanced. These characteristics include the average total tax paid in 2023, the proportion of businesses with zero filings in 2023, the number of months since registration, the proportion of businesses whose tax obligation began in 2023, and the number of tax filings made. The first four columns report the mean and standard errors (in parentheses) for each variable across the four different samples: (1) Control, (2) Any Treatment, (3) Anchor, and (4) Reminder. The last four columns report the difference in means, with ***, **, and * indicating whether differences in the means across the groups are significant at the 1%, 5%, and 10% levels, respectively. Sample sizes and F-Stats for joint balance checks are also reported.

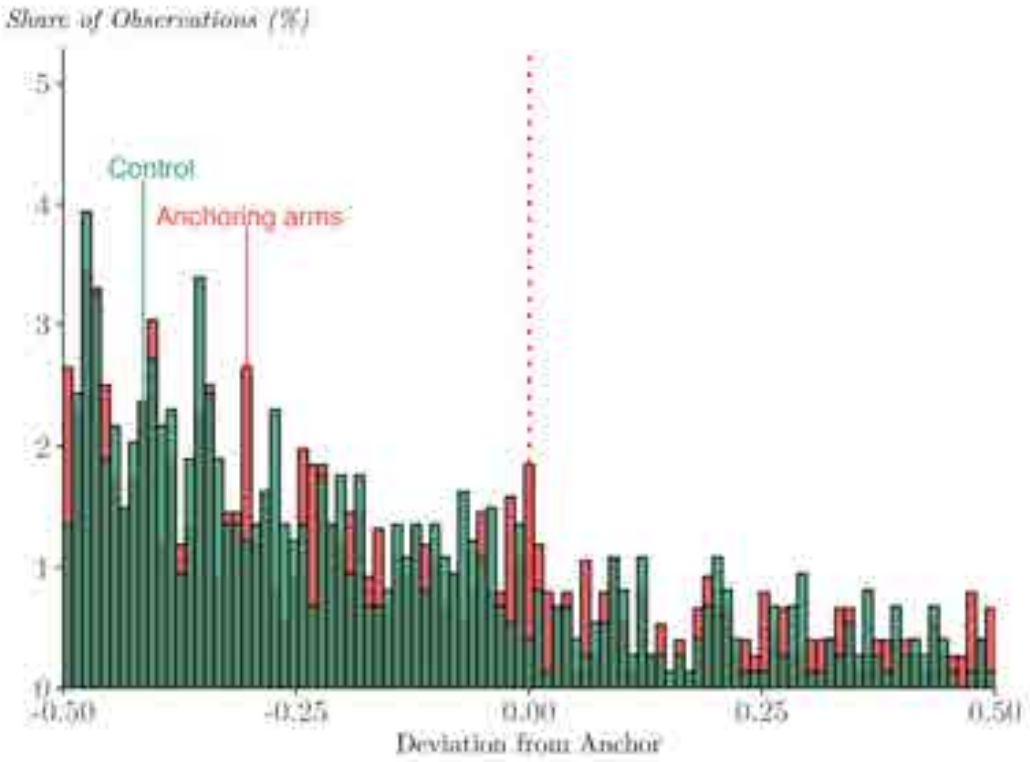
Table A.3: Differences in Characteristics Across Status of SMS Delivery

	(1) Sms Delivered	(2) Sms Not Delivered	Difference (1) - (2)
Panel A: Whole Sample			
Avg ToT Paid, 2023	1285.694	1251.186	-34.509
	[28.192]	[22.306]	
Zero Filing, 2023	0.054	0.047	-0.007
	[0.004]	[0.003]	
N of Months since registration	21.312	21.19	-0.122
	[0.32]	[0.271]	
ToT Obligation began in 2023	0.446	0.441	-0.005
	[0.01]	[0.008]	
N of Filings	12.079	12.338	0.259
	[0.173]	[0.147]	
Observations	2,720	3,834	
F-Stat			1.662
Panel A: Below Median			
Avg ToT Paid, 2023	263.679	262.512	-1.167
	[9.497]	[7.794]	
Zero Filing, 2023	0.118	0.108	-0.01
	[0.009]	[0.008]	
N of Months since registration	23.347	22.528	-0.819
	[0.466]	[0.407]	
ToT Obligation began in 2023	0.381	0.388	0.007
	[0.014]	[0.012]	
N of Filings	11.156	11.241	0.085
	[0.245]	[0.217]	
Observations	1,256	1,674	
F-Stat			1.187
Panel A: Median and Above			
Avg ToT Paid, 2023	2162.505	2017.408	-145.098***
	[39.243]	[30.143]	
Zero Filing, 2023	0	0	0-
	[0]	[0]	
N of Months since registration	19.584	20.158	0.574
	[0.436]	[0.363]	
ToT Obligation began in 2023	0.502	0.483	-0.019
	[0.013]	[0.011]	
N of Filings	12.872	13.188	0.317
	[0.242]	[0.198]	
Observations	1,464	2,160	
F-Stat			2.674

Note: This table shows that the background characteristics of respondents across treatment and control groups are balanced. These characteristics include the average total tax paid in 2023, the proportion of businesses with zero filings in 2023, the number of months since registration, the proportion of businesses whose tax obligation began in 2023, and the number of tax filings made. The first two columns report the mean and standard errors (in parentheses) for each variable across the two different samples: (1) SMS Delivered, and (2) SMS Not Delivered. The third column reports the difference in means between these two groups. ***, **, and * indicate whether differences in the means across the groups are significant at the 1%, 5%, and 10% levels, respectively. Sample sizes and F-Stats for joint balance checks are also reported.

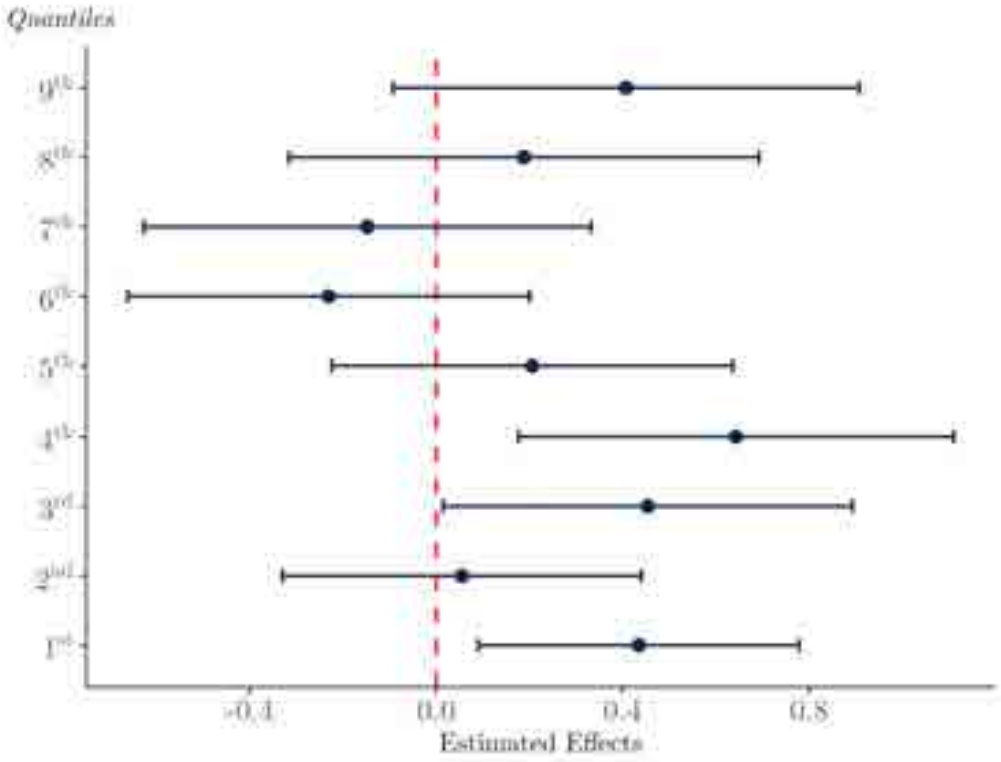
A.5 Additional results from the experiment

Figure A.6: Distribution of the Difference Between Total Amount Paid and Anchoring Value as a Percentage of the Anchoring Value



Note: This figure illustrates the distribution of the difference between the total amount paid and the anchoring value, expressed as a percentage of the anchoring value. This metric helps to understand how payments deviate from the set anchoring value, providing insights into the effectiveness of the anchoring strategy. Positive values indicate that the amount paid exceeded the anchoring value, while negative values indicate payments below the anchoring value. The red bars represent the sample within the Anchor Treatment arm, while the green bars represent the rest of the sample.

Figure A.7: Heterogeneity LATE Effects: Log Total Payments by deciles (Anchor Treatment)



Note: This graph reports the main estimates for the Local Average Treatment Effect (LATE) using Instrumental Variables (IV). The outcome of interest is the log of the amount effectively paid. The estimates are presented separately for the Anchor treatment arm. The estimates are provided for nine quantiles, representing different ranges of deciles within the tax region payment distribution. Each estimation was run separately. The instrument used for the IV regression is the actual delivery of the message.The control variables include the average amount paid at baseline, the average amount paid within the region (strata), a dummy variable indicating consistent monthly filing, a dummy variable for non-filing in 2023, and a dummy variable for taxpayers who registered in 2023. Standard errors are robust. The graph also includes 90% confidence intervals for each estimate.