

**Final report**

Fiscal impacts of a  
presumptive tax for  
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Rwanda

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# **Fiscal impacts of a presumptive tax for microenterprises in Rwanda**

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International Growth Centre and Georgetown University

Final Report Submitted to the Rwanda Revenue Authority

July 2017

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Growth Centre



*GEORGETOWN UNIVERSITY*  
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## Executive summary

This report examines the impact of the 2012 reform to micro and small enterprise tax law, which created a presumptive ‘flat fee’ regime in both Personal and Corporate Income Tax. In this regime, taxpayers whose turnover falls within a given band pay a fixed liability, with a zero marginal tax rate. Subsequent years have seen growth in both registered taxpayers and total taxes collected under the CIT and PIT, but these are not necessarily attributable to the 2012 reform.

We identify four channels through which this may have affected tax revenues. Two of these are *intensive* -- they affect the revenues derived from existing taxpayers -- while the other two are *extensive* -- they operate through the entry and exit of firms to and from the tax net. Impacts on intensive margins are negative, and can be estimated directly from taxpayer behavior. Impacts on extensive margins are positive, but cannot be point identified without strong assumptions. Consequently, we estimate upper bounds that highlight the largest possible positive effects on these extensive margins that are consistent with the data. We use these upper bounds to demonstrate how a range of assumptions about the strength of reform impacts on induced impacts and averted dropouts, respectively, can yield a positive total effect of the regime for recent tax years.

For example, we estimate total losses on the intensive margin of RWF 332.1 million for the 2012 tax year. These losses are too large to be offset by entry into active taxpayer status alone, since they exceed the upper bound on that channel for 2012. Consequently, the likely fiscal impact of the reform in 2012 was negative. By contrast, in the 2015 tax year estimated losses on the intensive margins were RWF 254 million, while many taxpayers had entered the tax base for the first time via the flat-fee regime since its introduction: the total taxes paid by such flat-fee entrants in 2015 constituted RWF 721.7 million. Consequently, less than half of this upper-bound on positive effects through the entry mechanism need have actually been caused by the flat-fee regime in order for its net effects to be positive.

Similar exercises can be conducted for other plausible assumptions about extensive-margin impacts. For example, if new entrants who file under the flat-fee regime would have entered one year later in its absence, the total benefit arising from the entry channel in 2015 is RWF 131 million. In that case, the flat-fee regime must also have averted the drop-out of taxpayers responsible for a further RWF 141 million in order for its net fiscal impact to have been positive in that year. This would constitute 20 percent of the taxes paid in 2015 by flat-fee taxpayers who also filed in 2014. More generally, we demonstrate the specific range of assumptions regarding the share of these tax contributions that can be causally attributed to the flat-fee regime's extensive-margin impacts that yield estimates of overall positive effects on the tax take for 2015.

Taking these findings together, we argue that there is a reasonable policy case to reform rather than repeal the flat-fee regime. The reduced administrative burden for taxpayers and auditors is a social benefit not accounted for in the empirical exercise of this paper. Moreover, there has been a downward trend in intensive-margin losses since 2013. There

remains scope for refinements to the design of the flat-fee regime to further reduce these intensive-margin losses, while easing the burden of joining -- and staying in -- the tax net.

## 1. Introduction

Since 2011, Rwanda has seen substantial changes in both *tax administration* and *tax policy* for MSMEs. Key changes include the introduction of a 'flat' (i.e., presumptive) tax in the lump-sum (i.e., turnover) regime during 2012, and the introduction of the m-Declaration system for filing tax declarations in 2013. These reforms share a common goal of reducing the administrative cost of participation for small taxpayers; it was hoped that these might not only encourage more regular reporting, but even encourage entry onto the formal tax rolls by some firms not previously registered with RRA.

Against that background, this policy report seeks to evaluate the impacts of the introduction of the flat-fee regime for micro and small taxpayers. Here, we will document changes on four margins of taxpayer behavior and associated tax revenues. Two of these, entry and exit, we term *extensive* margins. The remaining two are *intensive* margins, in the sense that they operate on a given stock of taxpayers. These intensive-margin impacts include the regime's reduction of the tax liability for a given level of turnover, and the taxpayers' responses to incentives under this regime to distort their reported turnover.

Because this reform was rolled out universally in 2012, there is no 'natural experiment' that can provide credible and precise estimates of its impacts. Rather than draw conclusions from tenuous assumptions, we take a more conservative approach here. We can quantify precisely the reform's (negative) impacts on the intensive margin. To understand whether these losses are offset by positive impacts on the extensive margin, we provide upper bounds under plausible assumptions, which characterize the largest revenue gains on those margins that are consistent with observed data. We then demonstrate how the elements of this analysis can be put together with alternative assumptions for the strength of the extensive-margin impacts in order to allow policymakers to calculate the reform's impacts under the assumptions they consider most plausible, and to examine the sensitivity of their conclusions to these assumptions. In addition, we consider the implications of making a specific, intermediate assumption about revenue gains due to entry into the tax net. If the effect of the flat-fee regime is to accelerate entry into the sector by one year, for firms that would otherwise have joined the tax net, then we estimate that the net fiscal losses attributable to the flat-fee regime are at most RWF 141 million; combining this with modest assumptions regarding the amount of dropout from the tax base averted by the lower tax burden and greater simplicity of the flat-fee regime could yield a positive net fiscal impact.

The remainder of this report is structured as follows. In Section 2, we describe the evolution of tax payment outcomes in the MSME regime over the period 2010 -- 2015. Section 3 focuses on the introduction of the 'flat' or presumptive tax regime. Section 4 analyzes the impact of administrative changes, through the m-Declaration regime. Section 5 concludes.

## 2. Patterns in SME taxpayer participation, 2010 -- 2015

To set the stage for our analysis, we describe the changes in the tax policy environment over the period 2010 -- 2015, and the concurrent changes in taxpayer behavior.

### 2.1. Tax policy regime change

From 2006 to 2012, the Government of Rwanda operated a simple tax regime based on a 4% turnover tax. During that period, business with turnover below RWF 20 million were given a choice between either a standard income tax (corporate or personal) regime, or a tax regime based on turnover alone. The corporate income tax required a payment of 30% on all liabilities, while the personal income tax imposed this as a marginal rate for (net) income above RWF 1.2 million, but imposed no tax on personal income below RWF 360,000/year, and a 20% marginal rate on income between RWF 360,000 and RWF 1.2 million. The turnover tax was 4% of turnover.

In July 2012, Rwanda introduced a new taxation system for MSMEs (law 28/2012 on direct taxes on income), intending to make tax compliance easier for small firms with limited accounting capacity, and therefore improve tax revenues and broaden the tax base. There were two elements to this reform.

First, corporate and personal income taxpayers under the turnover-based regime faced a reduced marginal rate -- down from 4% to 3% of this base.

Second, the law created a new regime into which firms with annual turnover below RWF 12 million could opt. Under this new, 'flat fee' regime, firms' liability would be a set fee, based on the turnover *bracket* into which their revenues fall. This schedule imposes a fee of:

- RWF 0 for firms with annual turnover below RWF 2 million
- RWF 60,000 for firms with annual turnover between RWF 2m - 4m
- RWF 120,000 for firms with annual turnover between RWF 4m - 7m
- RWF 210,000 for firms with annual turnover between RWF 7m - 10m
- RWF 300,000 for firms with annual turnover between RWF 10m - 12m

These fees are calibrated to be equivalent to the 3% turnover tax for a firm whose revenues are at the *minimum* of the bracket into which they are grouped. Tying flat payments to the tax liability at the bottom of each brackets alone will give rise to a loss in revenue relative to the three percent tax rate on the same base in the 'lump-sum' regime as constituted after 2012. We quantify the foregone tax revenues attributable to this channel in Section 3.1. Finally, the flat fee regime imposes an effective marginal tax rate of 0% on revenues within each of the brackets, followed by an infinite marginal rate at 'notches' where the tax liability jumps discretely. This creates strong incentives for firms who would otherwise have revenue in a neighborhood above these thresholds to distort revenue -- either by altering their actual economic activity, or by misreporting -- in order to fall below the cutoff and reduce their tax liability. We will discuss evidence of such behavioral responses in Section 3.2.

In spite of these potential intensive-margin losses, the flat-fee regime was motivated by a desire to reduce the administrative burden of tax filing for microenterprises. Since firms' liabilities were determined only by the range into which they fell, any bookkeeping inaccuracies that did not cause them to cross such a threshold would not put firms at risk of substantial penalties. At the same time, enforcement might be made easier to the extent that firm types would be visibly identifiable as belonging to a particular category; in this sense, the new flat-fee regime resembles a *presumptive* tax system, in which firms are actually assigned fixed liabilities based on their sectors of economic activity. The net effect of this simplification was hoped to encourage entry into, and discourage exit from, the tax net. We discuss evidence of such impacts on the extensive margin of the tax base in Sections 3.3 and 3.4.

## 2.2 Taxpayer behavior

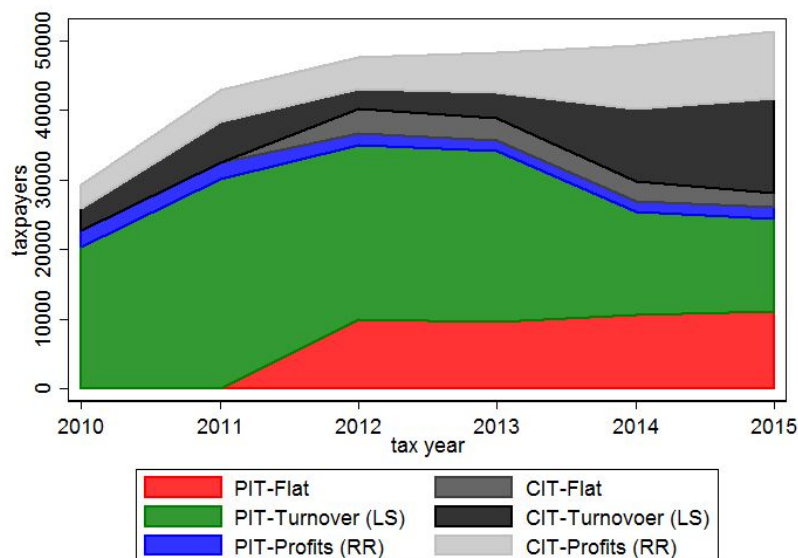
In this section, we document how the total tax take for corporate and personal income tax has evolved during the 2010 to 2015 tax years. Since the introduction of the 2012 reforms, there have effectively been three regimes within each of the Corporate and Personal Income Taxes. These are:

1. "Real"- in which their tax liability is 30% of firm profits;
2. "Lump Sum"- in which their tax liability is 3% of turnover;
3. "Flat fee"- in which their tax liability is a set fee based on their turnover *bracket*.

Because the boundaries between these are potentially fluid -- even, potentially, across the broad categories of CIT and PIT -- we consider participation in these regimes jointly.

Figure 1 illustrates strong growth in the number of active taxpayers over the period studied. We define active taxpayers as those filing annual returns in a given year. Over this period, we estimate that active taxpayers have increased by nearly 75%, growing from 29,353 in the 2010 tax year to 51,334 active filers in the 2015 tax year.

Figure 1. Overall growth in taxpayers, and a shift to CIT

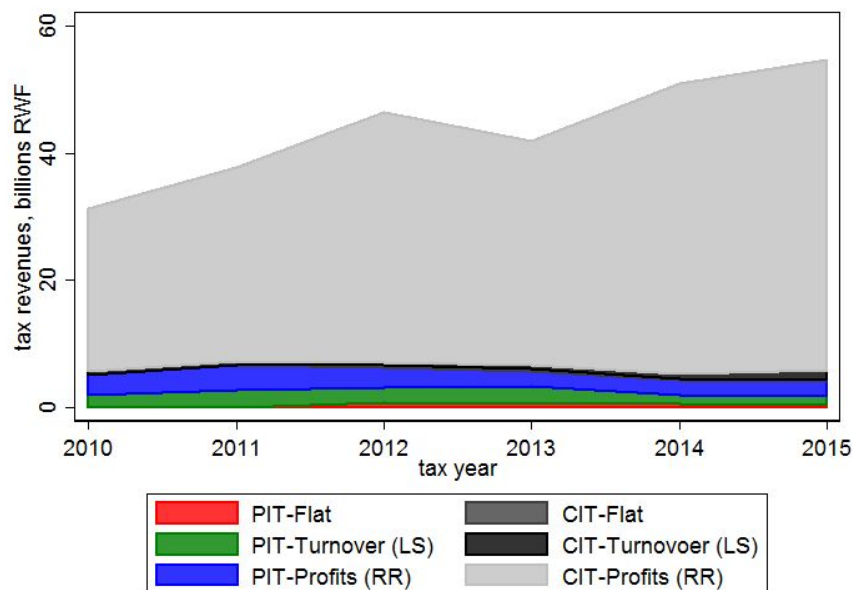


This has been a period not only of growth, but of substantial *shifts* in the composition of CIT-PIT taxpayers. Those paying into the CIT have increased by a staggering 282%, while overall growth in PIT taxpayers has been just under 15%, and has in fact been declining since 2012. These changes in the relative shares of PIT and CIT are emphatically not driven by changes in the filing category of existing taxpayers: there are effectively no taxpayers switching from CIT to PIT or vice versa.

On the other hand, there is substantial churn in tax regime choice *within* each of the CIT and PIT categories. Of the 15,950 taxpayers who file in both 2010 and 2015, fully 5,334 file under a different regime between these two years. Just over 40 percent of all filers in the flat fee regimes in 2015 are taxpayers who have filed since at least 2010, who have switched into the (PIT or CIT) flat fee regimes. While this is a substantial share, it leaves scope for the hypothesis that the new regimes may also have induced entry into the tax net. We return to that question in depth in Section 3.1.

The rising importance of the CIT over the PIT is even more pronounced when viewed in terms of the corresponding tax take, rather than the number of taxpayers. Over the period examined, the CIT rose from 83% of the income tax take in 2010 to above 92% in 2015.

Figure 2. Substantial growth in total tax take, driven by CIT Real Regime



This phenomenon is not driven entirely by large taxpayers, either, although it is certainly the case that large taxpayers play an outsized role in overall tax receipts. Confining the analysis to small and medium taxpayers, with turnover under RWF 20 m in a given year, the share of the CIT nonetheless rises from 48% to 71% of tax receipts within this category over the period examined.

The dramatic changes in taxpayer participation during this period raise the question of what role was played by changes in tax policy and administration. We turn to this now.

### **3. Microenterprise tax policy reform and taxpayer participation**

In this section, we document four margins on which the introduction of the flat fee microenterprise tax may have affected revenues since its introduction in 2012. The first two of these are *intensive-margin* effects, in the sense that they operate through the revenues received, taking the number of taxpayers as given. These intensive-margin channels are (1) the tax liability of active taxpayers conditional on their declared turnover, and (2) the declared turnover of active taxpayers. In addition, we consider two channels of *extensive-margin effects*, that change the number of active taxpayers: (3) the rate of taxpayer entry into the tax net by new taxpayers, and (4) the rate of exit from the tax net by existing taxpayers.

#### **3.1. Foregone revenue assuming no behavioral response by flat-fee (presumptive) taxpayers**

As explained in Section 2.1, the flat fee regime fixed the total liability in a given bracket to the smallest lump-sum (3% turnover) tax burden that a firm could have within that bracket: the flat fee was fixed at 3% of the minimum qualifying revenue for each bracket. Consequently, for a given revenue report, the reform reduced the total tax burden for firms whose reported revenue was above the bottom of their corresponding bracket, relative to the three percent tax on the same base in the 'lump-sum' turnover regime.

To estimate the fiscal consequences of the reform through this channel, we undertake the following, simple exercise. For the time being, we assume that firms' reported revenues were unaffected by the reform (we revisit the possibility that firms' reported revenues were distorted by the reform in Section 3.2). In addition, we suppose that in the absence of the flat-fee regime, the same taxpayers would have paid a tax equal to 3% of their turnover under the lump-sum regime (we quantify potential impacts through entry and exit into the tax base in Sections 3.3 and 3.4 respectively).<sup>1</sup> We can then calculate a counterfactual lump-sum tax payment for each taxpayer who participated in the flat-fee regime in a given year, as simply three percent of their declared turnover. The difference between this counterfactual amount and their actual tax payment estimates the losses due to this channel.

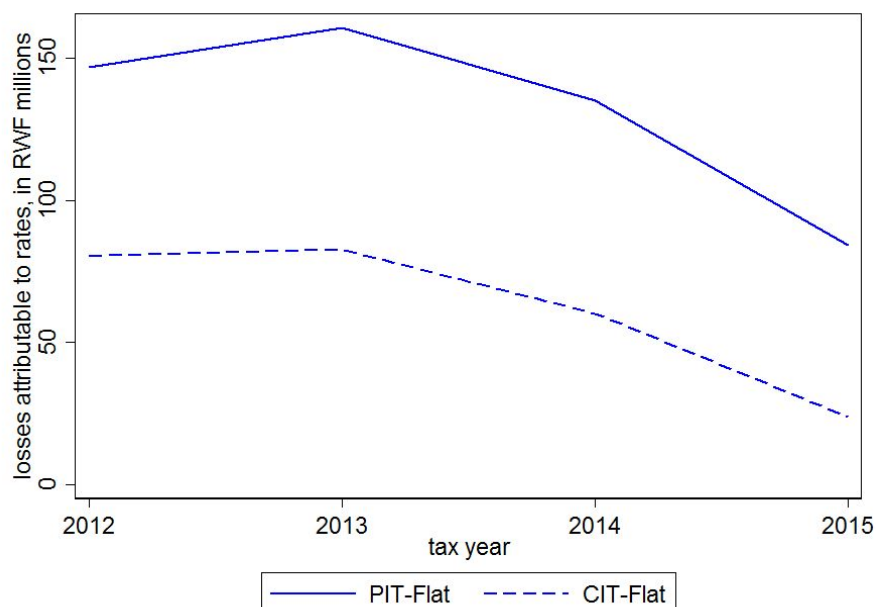
These estimates are shown, for each of the two flat-fee (presumptive) tax regimes in Figure 3. Total attributable losses across the two regimes are substantial: we value these at RWF 227.3 million for 2012; RWF 243.3 million for 2013; RWF 195.4 million for 2014; and RWF 108.1 million for 2015. These 'losses' are between 19.2% (in 2013) and 10.3% (in 2015) of the tax the same firms would have paid had they reported (the same turnover) under a lump-sum, three percent turnover tax.

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<sup>1</sup> In effect, we assume that the same taxpayers would have been under the lump-sum regime in the absence of the reform. Apart from the plausibility of this assumption, we note that flat-fee taxpayers do not report sufficient information to calculate what their tax payments under the real regime (profit tax) would have been in any given year.



Figure 3. Fiscal losses attributable to direct effect of reduced liability



Notes: Estimates take reported turnover as given. Lump-sum (3 percent turnover) regime liability taken as counterfactual tax payment for each flat-fee regime taxpayer.

Though substantial in relative terms, these direct, intensive-margin effects of the change in liabilities, taking the set of taxpayers and their declared turnover as given, may be outweighed by positive effects on entry into the tax net and/or a reduction in firms exiting the tax net. We turn to the remaining intensive- and extensive-margin channels below.

### 3.2. Reported turnover responses to changes in marginal rates

Given the sharp decline in tax liability at the ‘notches’ that mark the transition between taxpayer bins, firms have a strong incentive to distort their reports -- or perhaps their actual turnover -- in order to locate in a lower bracket. If such distortions in declared turnover reduce firms' tax liability, then they yield a second intensive-margin channel of fiscal impact.

To understand the fiscal cost of this behavioral response, we provide evidence of firms' ‘bunching’ below these notches (Kleven and Waseem 2013; Waseem 2016). We first do so visually. We then provide a quantitative estimate of the excess mass of firms below the notch, focusing on the first notch (at revenues of RWF 2 million) where most of the firms are located. Although this approach does not allow us to identify distortion by any particular taxpayer, we can associate a fiscal cost with the excess mass.

In Figures 4a to 4d, we demonstrate the distribution of firm tax response in the post-reform period. Each subfigure shows a histogram of firms in that year, and the notches at which tax liabilities jump under the flat-fee regime are denoted by solid blue, vertical lines. As is immediately clear, there is a substantial spike in the frequency of firms with turnover just below the lowest of these notches, which occurs at a turnover of RWF 2 m. (In Appendix A,

we demonstrate that there is no such systematic pattern of bunching for firms filing under other tax regimes.)

To estimate the extent of this distortion, we fit a smooth curve to the distribution of firm turnover based on bins above the notch, and extrapolate this to infer how many firms should be expected just below the notch. More precisely, we fit a fifth-order polynomial to the distribution of firm turnovers above the first notch (with the polynomial centered on the notch at RWF 2 m).<sup>2</sup> Extending this fitted distribution to firms declaring immediately below the RWF 2 m cutoff provides an estimate of the ‘excess mass’ at that point. For example, for the 2012 tax year, we estimate that 1,746 firms reporting revenues between RWF 1.75 and 2 m would, in the absence of this notch, report revenues above that threshold; the corresponding figure for 2015 is 2,431 firms.

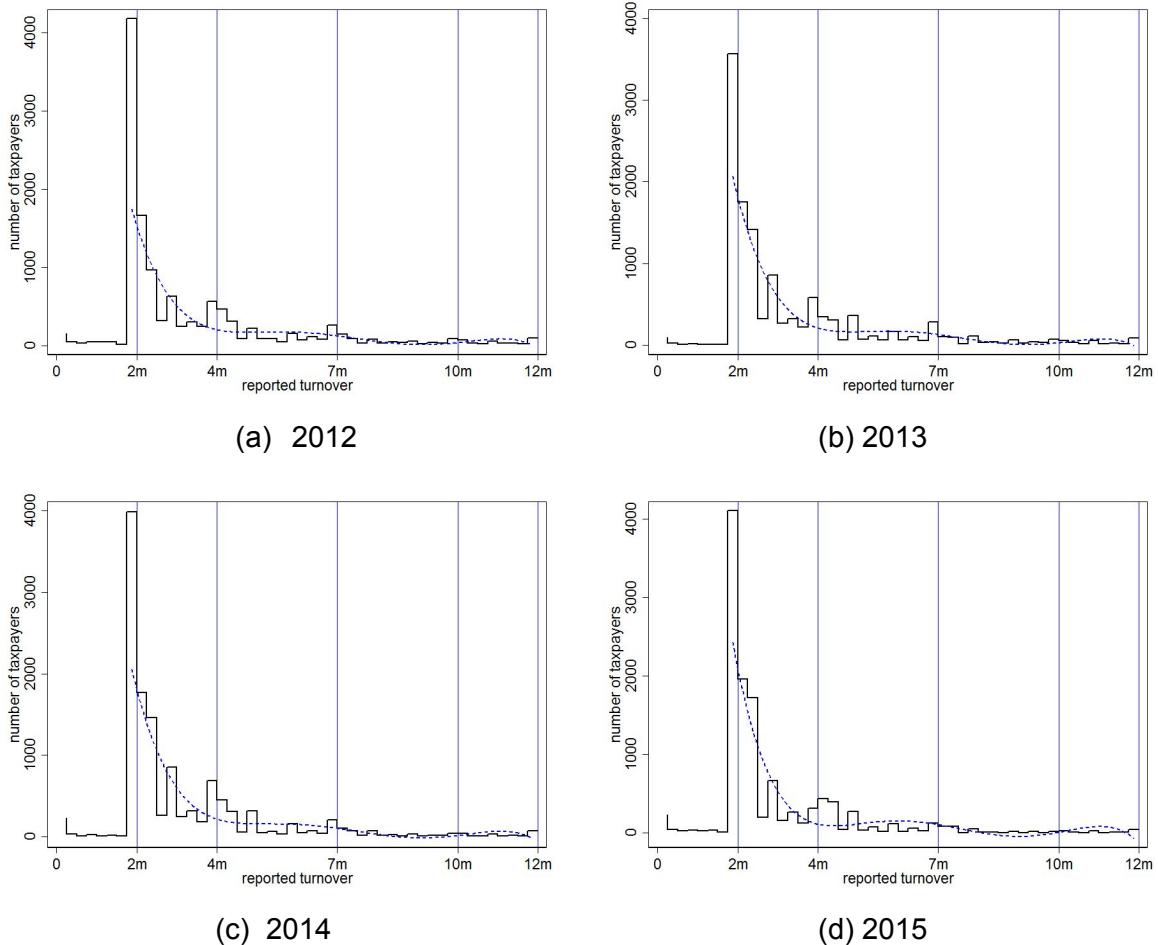
Since each firm that is induced by the lump-sum regime to report a turnover level below RWF 2 million reduces its CIT or PIT liability from RWF 60,000 to zero, we can use these estimates to put a value on the resulting foregone revenue. The corresponding estimated costs arising from this distortion are RWF 104.8 m for 2012; RWF 123.8 m for 2013; RWF 123.2 m for 2014; and RWF 145.9 m for 2015.

Taken together, the two channels of reduced tax rates for a given turnover (Section 3.1) and induced distortions in turnover (Section 3.2) comprise our estimates of the intensive-margin losses associated with the introduction of the lump-sum regime. These losses are not surprising: the explicit design of the tax is to accept at least some such losses in order to simplify the tax regime in a way that encourages individuals and firms to join, and stay in, the tax base. We turn now to consideration of these extensive-margin benefits, before putting them together to discuss the potential total fiscal consequences of the lump-sum regime in Section 4.

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<sup>2</sup> Here, we depart slightly from the existing literature. Because firms below the first notch have zero tax liability, many whose tax revenues fall within that range may not submit a declaration; this is consistent with the low frequency of reported revenues below RWF 1.75 m. Consequently, we fit the distribution to firms above this cutoff only in order to estimate excess mass immediately below the cutoff.

Figure 4. Distribution of reported turnover in the Corporate and Personal Income Tax flat-fee regime



Notes: Figures show counts of firms in both CIT and PIT flat-fee regimes reporting turnover within bins of RWF 250,000. Notches in tax liability illustrated by blue, solid, vertical lines. Dashed line shows fitted distribution based on firms above the first (RWF 2m) notch, extended to the bin immediately below that notch: excess mass below the notch is given by difference between height of that bar and height of fitted distribution.

### 3.3. Impacts on taxpayer entry into the tax net

Estimating the impact of the presumptive (flat-fee) reform of the SME tax regime on entry faces a fundamental challenge. The fact that this policy was introduced for all locations and economic activities in a single year means that, while we can directly observe the rate of entry after the reform, there is no obvious way to provide a point estimate of the *counterfactual* rate of entry: how many new active taxpayers would there have been in the absence of this regime change?

One should be very cautious, for example, in interpreting changes in the rate of entry before and after the reform as allowing such an estimate of counterfactual entry rates. The problem

with doing so is readily visible in Figure 1: not only was the number of active taxpayers was growing even before the reform was introduced, but there is also growth in the registration into the CIT *real regime* even after the reform. Strong assumptions would be required in order to interpret rates of entry into the PIT or CIT presumptive-tax regimes as indicative of the rate of entry that there would have been in the absence of the reform. Instead, we propose an alternative approach, which allows us to consider how credible assumptions allow us to place 'bounds' within which the true impacts can credibly be assumed to fall.

We first take this bounding approach to estimate entry into the stock of active taxpayers induced by the reform. First, how much entry is there to explain? For each year, we define newly active taxpayers as those who pay taxes in that year (under any regime), and who have not previously been observed to pay either CIT or PIT in any regime.<sup>3,4</sup> In Figure 3, we show the number of newly active taxpayers for each regime, over the period 2011 - 2015.

As shown in Figure 5, there has been quite substantial entry of newly active taxpayers over the period studied. The greatest period of entry occurs for the PIT-Lump Sum regime, particularly for the 2011 and 2012 tax years. It should be noted that this coincides with a period in which the *business license registration became linked to tax registration*, and there were corresponding pushes for tax registration in the transportation sector in particular. Of the 13,741 taxpayers whom we categorize as newly active in 2011, fully 8,030 -- nearly 60% -- are registered in activities associated with transportation. Although this precedes the SME tax reform, it highlights the importance of care in the attribution of other entry to the SME tax reform itself, rather than to coinciding policy and implementation changes.

It is reasonable to assume that if the flat-fee regime induces a firm to become an active taxpayer, that firm will file under a (CIT or PIT) flat fee regime in the first year in which it files taxes. Of course, some firms who enter and file under CIT- or PIT-flat fee regimes might have entered even in the absence of the regime reform. Consequently, the *largest* impact that the MSME reform could have had on entry in any given year is given by the number of new entrants in the CIT-Flat and PIT-Flat regimes, respectively.

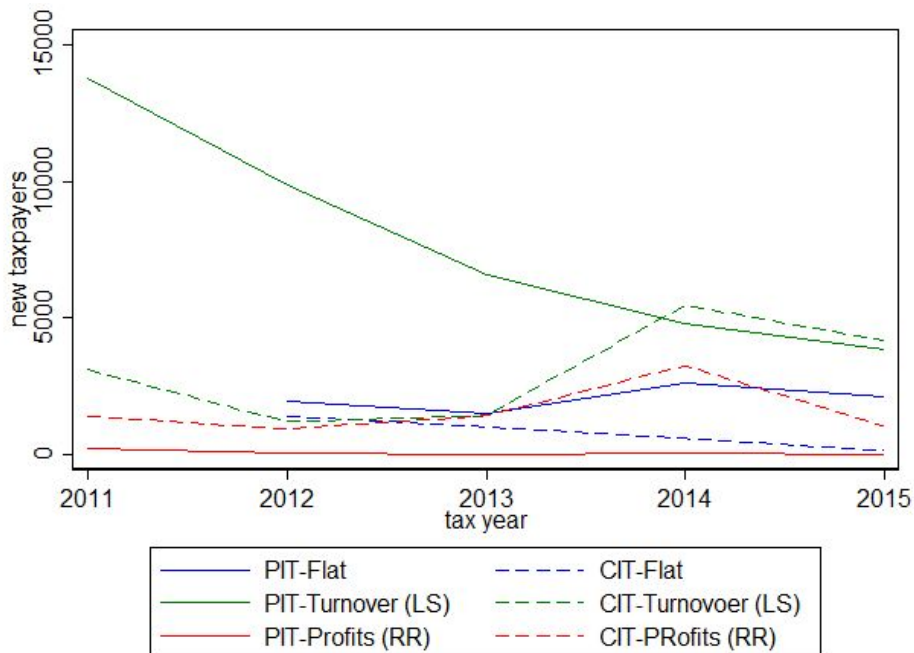
These upper bounds on entry effects are modest. For the CIT-Flat regime, 1,418 newly active taxpayers made declarations in 2012; this number falls to 1,031 in 2013; then to 612 in 2014; and finally to 163 in 2015. The numbers are slightly larger for the PIT-Flat regime: 1,948 newly active taxpayers in 2012; 1,535 in 2013; 2,633 in 2014, and 2,121 in 2015.

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<sup>3</sup> Because our data series begins in 2010, the earliest year for which we can compute this measure is 2011.

<sup>4</sup> If firms frequently drop out of active filing status and then return subsequently, this may lead us to overstate entry -- and disproportionately so for the earlier years of our series. The fact that entry estimates are rising for several tax forms over the period examined is encouraging in this regard.

Figure 5. Contribution of the presumptive ('flat') tax to entry has been modest.



Notes: Figure shows number of taxpayers in each year who have not declared CIT/PIT previously (from 2010 onward). Note that 60 percent of new taxpayers under PIT-LS in 2011 are in the transportation sector.

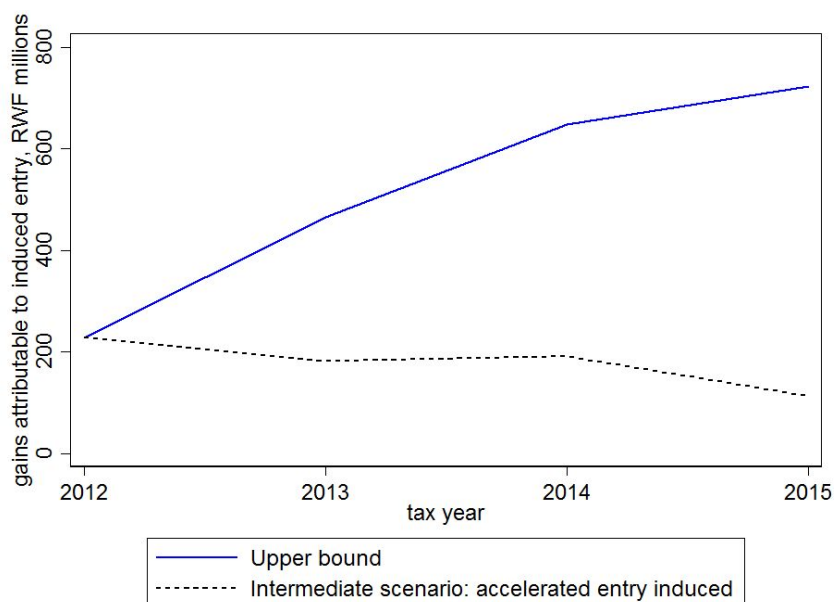
To estimate the revenue impacts that correspond to this upper bound, we attribute all taxes paid by firms that joined under either CIT-Flat or PIT-Flat in their first active year, and who are still active in the year considered, to the introduction of the regime. This means, for example, that the revenue impacts of the CIT- and PIT-Flat regimes in the year 2013 are estimated as all taxes paid by firms who were newly active under these categories in 2013, plus all taxes paid by firms who joined under these categories in 2012 and continued to pay taxes in 2013.

This approach allows us to estimate an upper bound for the tax contribution of the MSME tax reform on the tax take. Firms whose entry could possibly be attributed to this reform contributed RWF 228.2 m in tax in 2012, RWF 465.6 m in 2013, RWF 647.7 m in 2014, and RWF 721.7 m in tax in 2015. These numbers rise over the period because -- again, in the interest of estimating not the most likely but the largest possible impact that the reforms could have had through induced entry -- we continue to attribute the taxes paid by 2012 flat-tax entrants to the impacts of the reform, even when they pay taxes in 2013. The cumulative number of taxpayers whose entry is attributed to the reform rises over time, and so the upper bound providing the largest possible impact of the introduction of the flat-fee regime through the channel of induced entry also rises.

More realistic estimates would allow that some fraction of new entrants who join via the flat-fee regime would have joined even under the lump-sum turnover tax. One such intermediate assumption is new taxpayers who join the presumptive flat-fee regime would

have joined the tax net in any case in the following year.<sup>5</sup> If that were the case, then we should attribute these flat-fee entrants' revenues to the causal effect of the flat-fee regime only in their first year as taxpayers. There is now no systematic reason for this entry effect to rise over time. Figure 6 contrasts the fiscal consequences of this intermediate assumption about causal effects on entry with the upper bound described above.

*Figure 6. Fiscal impacts of presumptive tax through induced entry under alternative assumptions*



Notes: Upper bound attributes all future tax payments by new entrants into the flat-fee regime to the causal effect of that policy. Intermediate scenario shown corresponds to assumption that new entrants into the flat-fee regime are caused by that policy, but would have entered in the next year even in the absence of that policy.

This section has given us an estimate of the largest possible impacts of the introduction of the flat-fee tax regime for microenterprises on taxpayer entry, and the corresponding tax take under alternative assumptions about the likelihood that new taxpayers would have entered in subsequent years. We also illustrate how less extreme assumptions might be made about induced entry by the flat-fee regime, and the consequences of such assumptions. To complete the picture of these extensive-margin impacts, we must also consider potential effects of the presumptive tax on deterring taxpayer exit, which we turn to next.

### **3.4. An upper bound to fiscal impacts via on taxpayer attrition**

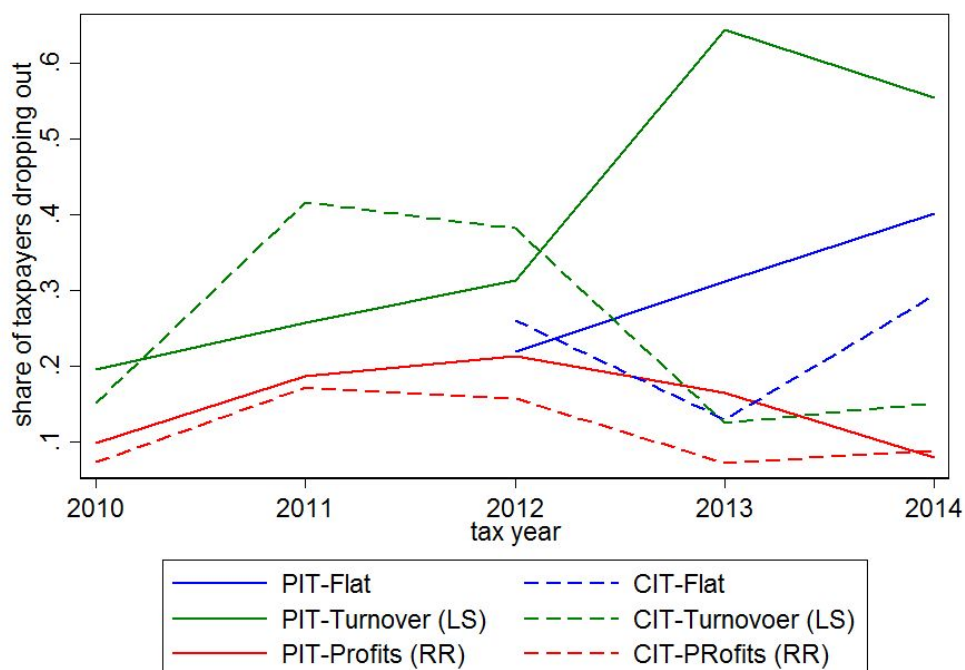
Finally, we consider a fourth margin on which the introduction of the flat-fee CIT and PIT regimes may have affected taxpayer behavior and associated revenues: namely, through taxpayers' attrition from active participation in the tax net. We measure attrition as any

<sup>5</sup> We thank participants in a seminar at the Rwanda Revenue Authority for suggesting this scenario.

taxpayer who declared taxes in one year, and did not declare taxes under any regime in the following year.

As Figure 7 shows, there is substantial heterogeneity in attrition rates across tax regimes and years. For both CIT and PIT, attrition rates are lowest for firms in the real regime; given the higher accounting standards to which such firms are subjected, it is reasonable to suppose that they may be more established. Attrition rates in the PIT flat-fee regime range from 21.9% to 40.2% of firms, while the attrition rate in the CIT flat-fee regime ranges from 26.1% in 2012, to 13.0% in 2013, to 29.4% in 2014. Attrition rates are not available for 2015, since filings for the 2016 tax year are not observed in the authors' current data series.

Figure 7. Attrition from active taxpayer status, by regime and year



Notes: Figure shows the share of taxpayers filing under each regime in a given year who fail to declare taxes the following year.

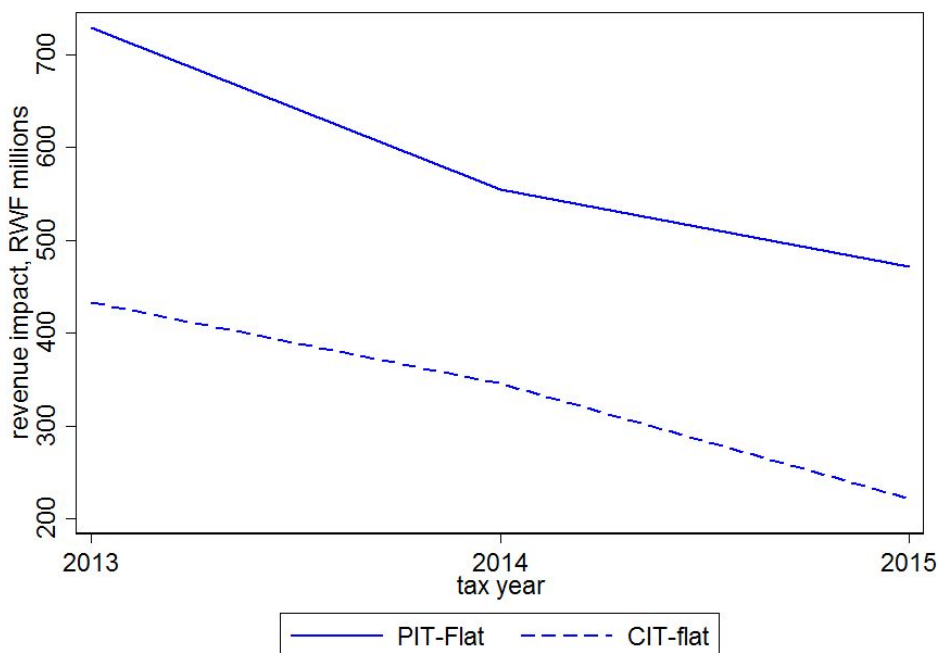
What lessons can be drawn from this about the plausible range of the reform's impacts on attrition, and its fiscal consequences? To the extent that both adoption of the flat-fee regime is preferred by those firms that join these regimes (a sensible assumption since the flat-fee regime reduced their tax burden for firms whose alternative was the lump-sum tax of 3% on their turnover), and to the extent that attrition from the tax net occurs primarily because of bad outcomes for firms, such as bankruptcy or zero revenues, then it seems reasonable to suppose that the fiscal impact of the reform's effect on attrition was greater than zero.

The largest impact that the flat-fee regime could have had on revenues through averted attrition is the case in which all of those flat taxpayers from the previous year who remained taxpayers in 2015 *would have attrited* in the absence of the PIT-flat regime. Considering 2015: since 29.4% of PIT-flat taxpayers did attrit between 2014 and 2015, those who remain

constitute 70.6% of 2014 taxpayers. The maximum conceivable (positive) impact on the 2015 aggregate tax take induced by the aversion of dropout from the PIT is then given by the total taxes paid in 2015 by these 70.6% of 2014 filers.

The extension of this approach to provide upper bounds on the possible savings due to averted attrition for each of the PIT and CIT is illustrated in Figure 8 below. Summing across the two flat-fee regimes yields a maximum impact of 1,116.2 m in 2013; 900.9 m in 2014; and 693.3 m in 2015.

Figure 8. Upper bound on fiscal benefit due to averted attrition from active taxpayer rolls



Notes: estimates reflect total tax take from individuals who paid into the respective regime in the prior year and declared positive revenues in the year in question. This would correspond to the true impact only in the extreme scenario in which all such taxpayers would have dropped out in the absence of the flat-fee regime.

It should be emphasized that these figures represent upper limits, *not* best guesses. Their use is to consider the plausibility of alternative assumptions. For example, if one were to suppose that 25% of the taxpayers who pay into a flat-fee tax regime and remain in the tax net the following year would have attrited in the absence of the reform, then the corresponding fiscal impact would be a quarter of the upper bound reported here. Attrition rates observed in other tax regimes and/or prior to the introduction of the 2012 reform may be helpful in gauging the reasonableness of any such assumed attrition rate; however, as shown in Figure 6, these attrition rates are wildly variable across regimes and time.

#### 4. Total fiscal consequences

Putting these together allows policymakers to consider the plausibility of alternative scenarios, and to calculate the associated fiscal impact of the regime under the assumptions



that appear most reasonable. To facilitate such an exercise, we summarize our key findings on these four channels in Table 1 below.

*Table 1. Summarizing estimated and bounded impacts on intensive and extensive margins*

Tax year	Intensive margin			Extensive margin		
	(A) Estimated impact due to rate reduction (Section 3.1)	(B) Estimated impact due to distortion of reported revenues (Section 3.2)	Total estimated losses from intensive margin (A+B)	(C) Upper bound on entry impact (Section 3.1)	(C') Intermediate scenario for entry impact (Section 3.1)	(D) Upper bound on attrition effect (Section 3.4)
2012	-227.3	-104.8	-332.1	+228.2	+228.2	n/a
2013	-243.3	-123.8	-367.1	+465.6	+181.7	+1,116.2
2014	-195.4	-123.2	-318.6	+647.7	+191.0	+900.9
2015	-108.1	-145.9	-254.0	+721.7	+113.0	+693.3

Notes: all figures in millions of Rwandan Francs.

For example, we estimate total losses on the intensive margin of RWF 332.1 m for the 2012 tax year. These losses are too large to be offset by entry into active taxpayer status alone, since they exceed the upper bound on that channel for 2012. Consequently, we think it plausible that the fiscal impact of the reform in 2012 was negative.

On the other hand, consider the 2015 tax year. In this year, estimated losses on the intensive margin were RWF 254 m. But on the other hand, many new taxpayers had entered the flat-fee regime since its inception, and the total taxes they paid in 2015 constituted RWF 721.7 m. If none of those taxpayers would ever have joined the tax net in the absence of the flat-fee regime, then the total effect of the flat-fee regime is substantial and positive even in the absence of any consequences for drop-out.

To be sure, many of these taxpayers would have joined the tax net even in the absence of the flat-fee regimes; estimates that take the sum of columns (C) and (D) represent the greatest possible impacts consistent with the data, *not the most likely scenario*. To provide more plausible estimates of impact, we can consider a variety of less extreme assumptions.

For example, suppose the only effect of the flat-fee regime is to accelerate the date of entry into the tax net by one year. Then the revenue gains attributable to new entrants -- comprising the taxes paid by new entrants in the year in which they enter, but not in subsequent years. The fiscal impact under this assumption is shown in the table as column (C'). Under this assumption, new entry induced by the flat-fee regime would constitute a gain of RWF 113 m, akin to assuming that in 2015, 15.7 percent of taxes paid by individuals

who at any point were new entrants into the flat-fee regime is attributable to the causal effect of the lump-sum regime itself.

But if only 36 percent of the ever-new taxpayer revenues accrue from firms who would not have joined in the absence of the flat-fee regimes, then the net impact is positive even if there has been no impact on aversion of drop-out from the tax net. At the other extreme, suppose there was no impact of the flat-fee regimes on entry in the 2015 tax year. Then if 37% of taxpayers<sup>6</sup> who paid through flat-fee regimes in 2014 and continued to file in 2015 would have dropped out in the absence of the flat-fee regime, the net impact is again positive.

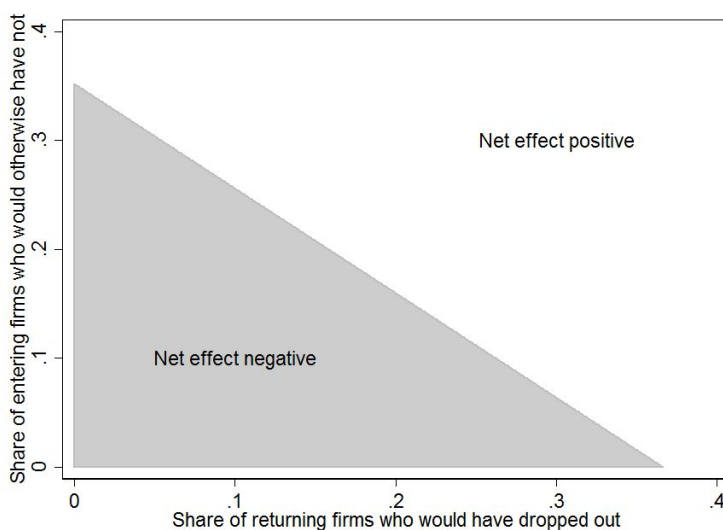
More balanced scenarios that also lead to positive net effects can also be calculated. For example, suppose that just 20% of new entrants into the flat-fee regimes are caused by the reform, in the sense that they would otherwise have stayed out of the tax net. We would then attribute  $0.20 * 721.7 = 144.3$  m RWF to the impact on entry. In order for the net effect of the reform to be positive, the remaining RWF 109.6 m in losses would have to be covered by averted dropouts. This corresponds to an assumption that 16% of those who paid flat-fee taxes in 2014 and stayed in the tax net in 2015 would have dropped out in the absence of these new regimes.

More generally, Figure 9 shows the combinations of assumptions about causally attributable shares of entry and drop-out that are consistent with an implied positive revenue effect for the 2015 tax year. For example, if we assume that the drop-out rate of firms in 2015 from those in the flat-fee regime would have been 30 percent in the absence of that regime -- a figure that is typical of lump-sum turnover taxpayers -- then one only needs about 8 percent of the entrants into the flat-fee regime to have been caused by the introduction of that policy in order for the net effect of the reform to be positive.

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<sup>6</sup> More precisely, what is required is a number of taxpayers sufficient to constitute 37 of the associated tax liability; this corresponds to 37% only if the affected taxpayers are representative of those who would have remained regardless. For ease of exposition, we refer here to shares of taxpayers rather than shares of tax revenue.

Figure 9. Assumptions regarding entry- and exit effects, and their implications for the net effect of the reform on 2015 tax revenues.



Notes: Vertical axis describes assumed values for the share of firms who enter the tax net and declare through a flat-fee regime in their first year (see Section 3.1). Horizontal axis describes assumed values for share of firms declaring through a flat-fee regime in 2014 and remaining in the tax net in 2015, for whom it is assumed that they would have dropped out of the tax net in the absence of the corresponding flat-fee regime. Shaded area describes combinations of these assumed parameters for which the net effect of the flat-fee regimes on 2015 revenues would be negative; positive revenue effects arise in the upper-right quadrant.

## 5. Conclusions

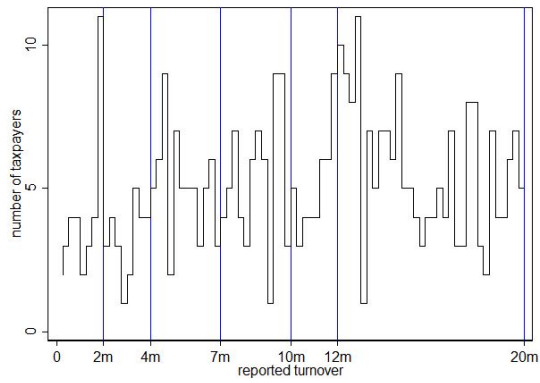
This report has sought to understand the fiscal consequences of the 2012 reform the micro and small enterprise income taxation, which introduced a flat-fee regime of fixed liabilities within specified bands, alongside the existing turnover tax and real (profit) tax for firms. We have identified four channels for these fiscal consequences. Two of these are on the *intensive margin* of affecting firms conditional on their status as active taxpayers. For these we can provide precise impacts of the associated fiscal losses. The other two channels are on the extensive margin, comprising induced entry and averted exit from the tax net. For these, it is not possible to provide point estimates without making specific assumptions for which there is no empirical basis, but we are able to place upper bounds on the positive impacts of these channels, and we show how fiscal consequences would respond to a range of intermediate assumptions. For example, if the flat-fee regime has no effect on dropout, and if all new entrants into the flat-fee regime are induced by its introduction but would have joined the tax net in the subsequent year regardless, then the total fiscal effect of the regime is a loss of RWF 141 million in 2015. But small departures from these specific assumptions can deliver positive net effects: these are within the estimated bounds, and combinations of assumptions about drop-out and entry-effects to deliver a positive total effect seem reasonable.

The preceding analysis has sought to be cautious in attributing fiscal gains to induced entry to or averted dropout from the tax net. Rather than make the kind of very strong - and likely unwarranted - assumptions that would be needed to provide a single number, we have provided the basis for policymakers to form their own judgments, based on their view as to plausible assumptions. With those caveats, however, it is our opinion that while the combinations of required entry and drop-out effects for fiscal impacts to be positive may be slightly too large, plausible sizes for these effects would imply that the fiscal losses are relatively small, at least for 2015.

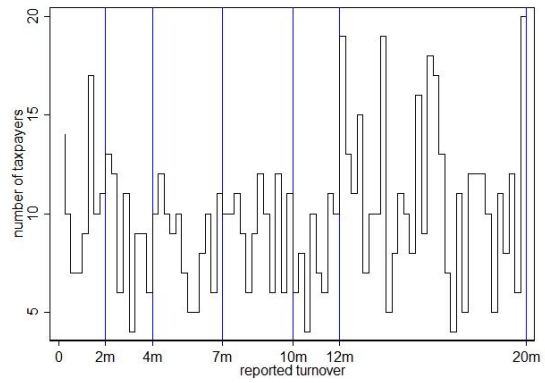
In light of this, we believe there are three reasons that the burden of proof should be on abandoning the fixed-fee regime. First, not valued in this analysis are either the direct benefits to taxpayers from simplified accounting requirements, or any savings to the RRA arising from reduced audit costs. Second, since 2013 the trend in estimated losses on the intensive margin has been downward. Should this continue, it will further reduce the magnitude of the required impacts on the extensive margin to offset these losses. And third, we note that it may be possible to revisit the placement of flat-fee tax brackets and the liabilities associated with these in coming years. It is possible that the combination of such refinements to the tax policy, together with enforcement that helps to ensure firms are located in an appropriate flat-fee bracket, can substantially reduce the intensive-margin losses associated with this regime. Estimates of taxpayers' likely responses to any new regime can be projected from the extent of bunching under the current regime. The IGC would be happy to support the design, piloting, and evaluation of such revisions.

## Appendix A. 'Bunching', and its absence, by regime and over time

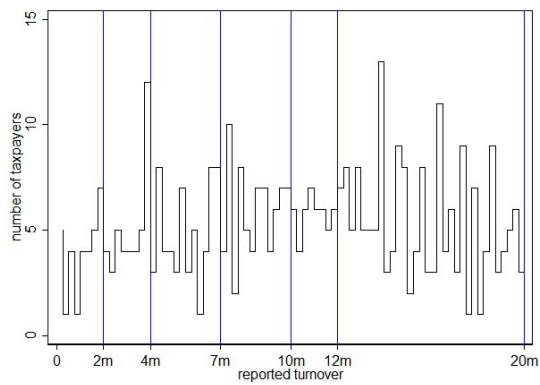
Figure A. Absence of bunching in CIT-PIT real regime



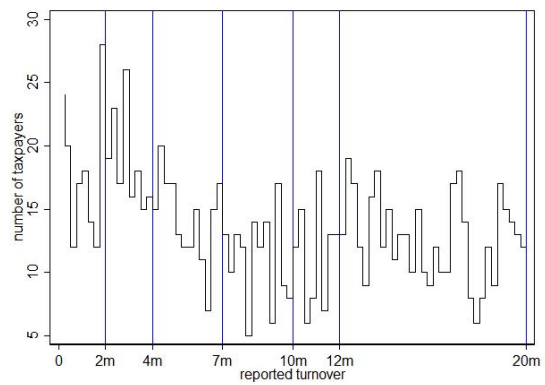
*PIT Real regime, 2012*



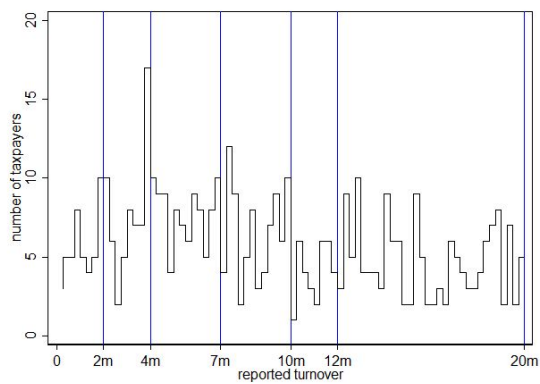
*CIT Real regime, 2012*



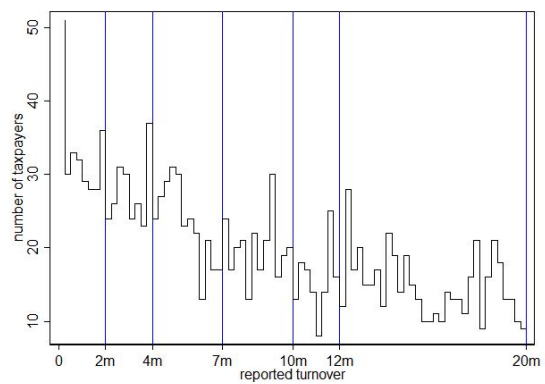
*PIT Real regime, 2013*



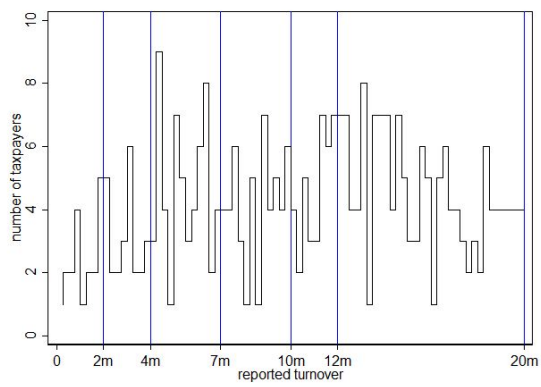
*CIT Real regime, 2013*



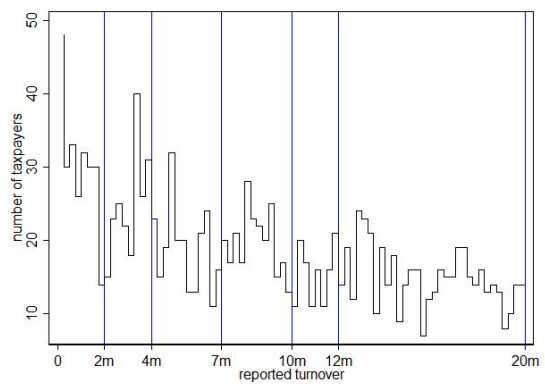
*PIT Real regime, 2014*



*CIT Real Regime, 2014*



*PIT Real Regime, 2015*



*CIT Real Regime, 2015*

Notes: Figures indicate distributions of reported revenues in each tax category and year. Blue lines indicate thresholds for each band of the presumptive ('flat') tax.

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