Tax Structure and Avoidance: “Simplifying” Taxation of Firms

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Tax Policy in Developing Countries

- Taxes key to development (Besley and Persson 2013)

- Weak enforcement capacity, prevalence of evasion undermine development of tax base

- Especially among firms operating at the margins of the formal economy — 20-65% GDP in Sub-Saharan Africa (Medina et al. 2017)
Strategies for Building the Tax Base

1. Third-party reporting (Brockmeyer and Hernandez 2017; Carrillo et al. 2017; Naritomi 2016; Bachas and Jensen 2015)

2. Enhancing oversight and punishment (Khan et al. 2015; Pomeranz 2015; Weigel 2017; Eissa et al. forthcoming)

3. Reducing bureaucratic barriers to compliance (Best et al. 2015; Galiani et al. 2015; Okunogbe and Poulquen ongoing)

This Study

- Quasi-experimentally evaluates impact on tax base of attempt to “simplify” tax compliance among small firms in Rwanda

- Separately identifies impact of individual tax instruments

- Provides evidence on non-traditional inputs to compliance decision
Roadmap

Background and Context

Motivating Framework

Impact of Reform

Mechanisms
Rwandan Tax System

Three main tax instruments:

1. Value-added tax (VAT)
2. Payroll tax (PAYE)
3. Income tax (CIT/PIT)

Enforcement focuses on the largest firms — which generate 90% of revenues

Micro and small firms comprise 86% of formal firms

Data: Universe of income tax, VAT, PAYE declarations 2008—2016

Descriptive Statistics  Taxable Income Distributions
Pre-Reform

Two options for small firms (< 50 million RwF annual turnover):

1. **Turnover Taxation:** $4\% \times \text{Annual Turnover [Revenue]}$

2. **Profit Taxation:** $30\% \times (\text{Annual Turnover} - \text{Costs})$
Income tax reform enacted in June 2012:

1. **Reduced marginal tax rate** in turnover regime by 25% (from 3 to 4%)

2. **Introduced optional lump sum schedule** for firms with less than 12 million RwF in annual turnover (with 25-62.5% reduction in effective tax rate)

3. **New exemption threshold** in lump sum regime: below 2 million RwF taxes go to zero

“This is a simplified declaration — people can now gain comfort knowing that being part of the tax net does not put them in ‘trouble’. It is also simple because they will not incur additional costs.”

— Richard Tusabe, Commissioner General RRA (The East African 2012)
Figure 1: Tax Structure Pre-/Post-Reform

- **Profits (Millions)**
- **Turnover (Millions)**
- **Profit Tax Due (Millions)**
- **Turnover Tax Due (Millions)**

- **4% Linear Tax (2008-2011)**
- **3% Linear Tax (2012-2016)**
- **Flat Tax (2012-2016)**
- **30% Profit Tax (2008-2016)**
Firms seek to minimize taxes and likelihood of enforcement:

- Second order production distortions
- Tax payment a “fee” /fixed cost to operating

Evasion is high (Waseem 2016, 2017)

Firms may not respond on the margin if:

- Changes in marginal/effective tax rate and mode of imposition second order to changes in likelihood of enforcement
- Responses influenced by information frictions and peers
Preview of Results

1. Conditional on the tax burden remaining positive, changing the marginal tax rate or mode of imposition have no aggregate impact on tax base

2. Reducing tax to zero below some threshold increases the amount of taxable income declared among affected firms

3. Most likely channels overestimation of audit likelihood and peer influence
Impact on Tax Base

Growth in tax base since 2009

- **Extensive Margin:** Number of firms reporting revenue to the tax authority

- **Intensive Margin:** Amount of taxable income reported

Why these matter

- Reducing scope of evasion
- Crafting optimal tax policy
- Long-term value of expanding tax net
Extensive Margin — Empirical Strategy

Difference-in-differences approach comparing formal participation (declaring positive revenue to the tax authority) among turnover taxpayers — pooling linear and flat taxpayers — to that among profit taxpayers within the same geographic unit and/or industry sector over time:

\[ N_{bst} = \alpha_s + \eta_t + \beta(Turnover_b \times 1[t \geq 2012]) + \delta Turnover_b + N_{bs} + \epsilon_{st} \]

where \( N_{bst} \) is the number of firms within geo-industry unit \( s \) in year \( t \) within either the turnover or profit base \( b \); geo-unit and year fixed effects. Standard errors are clustered at the geo-industry unit level.

Run specification separately for units determined by the district, sub-district (called “sector” in Rwanda), district and ISIC classification, and sub-district and ISIC classification.
Intensive Margin — Empirical Strategy

Difference-in-differences approach comparing the amount of taxable income declared among turnover taxpayers — pooling linear and flat taxpayers — to that among profit taxpayers within firms over time:

$$\ln Y_{it} = \alpha_i + \eta_t + \beta (\text{Turnover}_i \times 1[t \geq 2012]) + \delta \text{Turnover}_i + X_{it} + \varepsilon_{it}$$

where $\text{Turnover}_i$ is an indicator for a firm $i$ participating in the turnover taxation base and $\alpha_i$ are firm fixed effects. Standard errors are clustered at the firm level.

Estimate on balanced panel dropping switchers (rare). $\beta$ provides an estimate of the impact of the full reform on taxable income.
Effect driven by firms locating in 2-3 million RwF range to the right of exemption threshold
Intensive Margin

Figure 8: Intensive Margin Response by Pre-Reform Turnover Interval
A: All Firms (2011)
B: 2m RwF Turnover (2011)

Firms below exemption threshold pre-reform on average *double* reported taxable income; no response elsewhere
Summary of Results

1. Firms do not respond in tax base terms (conditional on tax burden remaining positive) to:
   - (a) change in marginal/effective tax rate
   - (b) change in mode of imposition
   - Findings supported by response to PAYE regime

2. Firms respond only to introduction of exemption threshold, increasing taxable income

3. Average impact on tax payment positive: only among those below 2m pre-reform (negative to for those above)
Bunching at Exemption Threshold

Figure 9: 2 million RwF Threshold

A: 2008

B: 2009

C: 2010

D: 2011

E: 2012

F: 2013

D: 2014

E: 2015

F: 2016
Mechanisms

Why are firms responding to exemption threshold?

Two potential explanations:

1. **Tax morale**: Firms want to contribute taxes to fund the state (Luttmer and Singhal 2013) — taxes $\rightarrow$ zero spurs increase in taxable income up to point where tax $> 0$ again

2. **Fear of enforcement**: Paying zero taxes raises the perceived probability of audit — firms increase taxable income until tax $> 0$
Tax Morale Hypothesis

- Plausible in Rwanda — popular autocracy

- But firms above threshold reduce tax payment (so long as tax $> 0$)

- Firms in linear regime also bunch to the right of 2 million despite taxes remaining positive

[Figure]
Fear of Enforcement

- Despite low levels of enforcement, strategy of “newsworthy” punishments for evaders and high fines

- Possible that once “in” tax base, perception that it’s hard to leave (at least in perceptual terms)

- Response to exemption threshold stronger where pre-reform local tax intensity is stronger
Local Tax Intensity

Figure 10: Response by Pre-Reform Tax Intensity

A: By Pre-Reform Local Formality

B: By Inside/Outside Capital

C: By Pre-Reform VAT Intensity

D: By Pre-Reform PAYE Intensity
Audit Likelihood

Figure 11: Audit Adjustments Pre-/Post-Reform
A: Distribution of Audit Adj.
B: 2 million RwF Threshold

Puzzle: when audit likelihood extremely low and continuous around threshold, why bunch to the right?

Overestimate likelihood of enforcement by 2.5 to 7 times!
Conclusion

1. Results consistent with model of firms seeking to maximize evasion and minimize enforcement

2. Firms unresponsive to traditional tax instruments, suggesting optimal tax policy should look substantially different

3. Information frictions may lead firms to substitute local peer behavior for knowledge about tax structure

4. Want to explore role of information frictions

**Question:** Is there space for an experiment to learn more about (a) perception of enforcement or (b) peer influences?