

GR 6307
Public Economics and Development

2. Taxation:

Raising Revenues with Tax Evasion and
Informality

Extra Slides on Papers we Don't Have Time for
in Class

Michael Carlos Best

Outline

Taxation in Developing Countries: Big Picture

Tax Evasion: Theory and Evidence from Rich Countries

Taxing Individuals in Developing Countries

Taxing Firms in Developing Countries

International Taxation and Developing Countries

Outline

Taxation in Developing Countries: Big Picture

Gordon & Li (JPubE 2009) *Tax Structures in Developing Countries: Many Puzzles and a Possible Explanation*

Gordon & Li (2009): Model

- ▶ J industries with CRS $f_j(K_j, L_j)$
- ▶ If don't use financial sector, informal firm and no tax:
 $\Pi = p_j^* f_j - rK_j - wL_j$
- ▶ If use finance, generate paper trail, but more efficient
 $\Pi = \frac{1+a_j}{1+s_j} p_j^* f_j - rK_j - wL_j$
- ▶ Let $\beta = I\{\text{use finance}\}$ then

$$\Pi = \max_{\beta_j, L_j, K_j} \left((1 - \beta_j) p_j^* f_j + \beta_j p_j^* \frac{1 + a_j}{1 + s_j} p_j^* f_j - rK_j - wL_j \right)$$

- ▶ Formalize if $s_j < a_j$

Gordon & Li (2009): Model

- ▶ Simple GE model with 3 goods to replicate stylized facts
 - 0 Non-tradable good
 - 1 Exported Tradable good
 - 2 Imported Tradable good
- ▶ Tax instruments:
 - ▶ excise taxes s_j
 - ▶ corporate profit tax τ_j (base is $rK_j / (1 - \tau_j)$ by CRS)
 - ▶ tariff m_2
 - ▶ seignorage iM (interest rate i , money stock M)

Gordon & Li (2009): Model

- Households: OLG.

$$V_t \left(\frac{wh}{g \left(p_t, \frac{p_{t+1}}{1+r}, \frac{i}{1+r} \right)} \right)$$

- $g(\cdot)$ is a price index, assume equal expenditure shares across hhs, welfare depends on g and wh
- Budget Constraint

$$whL_t = p_t C_t + \frac{p_{t+1} C_{t+1} + i M_{t+1}^h}{1+r}$$

Gordon & Li (2009): Model

► Assumption 1:

1. Inelastic labor supply
2. non-tradables weakly larger budget share for the old

► a_j varies across countries and industries: $a_c = \phi_j \theta_c$

► Assumption 2:

1. $\phi_0 < \phi_1 < \phi_2$
2. $\frac{K_0}{L_0} < \frac{K_1}{L_1} < \frac{K_2}{L_2}$ for all factor prices

Gordon & Li (2009): Formality Decision

- ▶ Formal firms: 0-profit condition gives

$$p_j \frac{1 + a_j}{1 + s_j} = c_j(w, r(1 + \tau_j))$$

- ▶ Informal firms: cash transactions → subject to inflation.

- ▶ Costs $d(\mu)$ to hold a share μ of turnover in cash.

- ▶ Profit rate: $(1 - i\mu - d(\mu))p_j - c_j(w, r)$

- ▶ Indifference:

$$p_j \frac{1 + a_j}{1 + s_j} - c_j(w, r(1 + \tau_j)) = (1 - i\mu^* - d(\mu^*))p_j - c_j(w, r)$$

Gordon & Li (2009): Results

- ▶ Governments seek to maximize social welfare

$$\underbrace{\sum_t \frac{V_t}{(1+\rho)^t}}_{\text{HH welfare}} + R \left(\underbrace{\sum_t \frac{1}{(1+r)^t} \sum_j \left(s_j \frac{1+a_j}{1+s_j} p_{jt} + \tau_j r k_j \right) \beta_j p_{jt} f_{jt} + \left(1 - \frac{v}{i} \right) i M_t + m_2 p_{2t} I_{2t}}_{\text{Government Revenue}} \right)$$

- ▶ Government gets more revenues from formal firms, so won't raise taxes so much as to tip firms into informality
- ▶ Informality decision implies constraints on tax instruments.

$$\underbrace{s_j \frac{1+a_j}{1+s_j} p_j + c_j(w, r(1+\tau_j)) - c_j(w, r) - \mu^*(i-v)p_j}_{\text{Extra revenue if firms in sector } j \text{ are formal}} \leq \underbrace{a_j p_j + dp_j + \mu^* v p_j}_{\text{costs firms willing to bear to avoid tax}}$$

Gordon & Li (2009): Results

- ▶ Proposition 1: Rich countries: θ_c high so no constraints bind and then
- ▶ uniform s_j
 - ▶ $\tau_j = 0$
 - ▶ $m_2 = 0$, low i
- ▶ Proposition 2: If constraint binds in sector 0
 - ▶ $1 + m_2 = \frac{1+s_2}{1+s_1}$
 - ▶ $s_2 > s_1$ if $e_0 > 1$ (PED of good 0)
 - ▶ $\tau > 0$
 - ▶ bigger i

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Tax Evasion: Theory and Evidence from Rich Countries

Dwenger, Kleven, Rasul & Rincke (AEJ:Pol 2016) *Extrinsic and Intrinsic Motivations for Tax Compliance: Evidence from a Field Experiment in Germany*

Alstadsæter, Johannesen & Zucman (WP 2018) *Tax Evasion and Tax Avoidance*

Dwenger et al. (2016): Overview

- ▶ Perhaps A-S predicts poorly because people don't understand the incentives they face?
- ▶ Or because people comply for *non-pecuniary* reasons?
 - ▶ moral sentiments
 - ▶ guilt
 - ▶ reciprocity
 - ▶ social norms
- ▶ Label all of these *intrinsic motivation*
- ▶ Run a field experiment to contrast impact with *extrinsic motivation* (financial penalties for non-compliance)
- ▶ Study local church tax in Bavaria, Germany

Dwenger et al. (2016): Setting

- ▶ All members of protestant and catholic churches must pay tax
- ▶ local tax collected by individual parishes
- ▶ Everyone who is baptised is liable when they turn 18 (even though <8% actually attend church)
- ▶ progressive tax schedule from €5 to €100 based on broad income
- ▶ Each May, churches mail people to self-assess and deposit their tax liability
 - ▶ at baseline no deterrence
- ▶ Overpayment is encouraged, treated as donations
 - ▶ identify intrinsically motivated people as overpayers at baseline

Dwenger et al. (2016): Model

- ▶ Model merging A-S with warm-glow (Andreoni 1988, 1990)
- ▶ Taxpayers have true income \bar{z} and face tax schedule $T(\bar{z})$. Report z and $T(z)$.
- ▶ Utility $u(c, T(z), s)$ c is consumption, $T(z)$ to capture warm glow, governed by parameter s .
- ▶ u'_T/u'_C increasing in s , 0 if $s = 0$. s is heterogeneous in population with cdf $F(s)$. $s = 0 \rightarrow$ A-S
- ▶ Taxpayers choose z to maximize

$$(1 - p) u(\bar{z} - T(z), T(z), s) \\ + pu(\bar{z} - T(z) - I\{z < \bar{z}\}(1 + \theta)[T(\bar{z}) - T(z)], T(z), s)$$

where p is audit probability, θ is penalty

Dwenger et al. (2016): Model

► Three types of taxpayers

1. *evaders*: $T(z) < T(\bar{z})$
2. *compliers*: $T(z) = T(\bar{z})$
3. *donors*: $T(z) > T(\bar{z})$

► Policy changes create intensive margin (changes in z within type) and extensive margin (taxpayers changing types) responses.

► Intensive margin response:

$$(1 - p) u'_{c_N} + p (1 - I\{z < \bar{z}\} (1 + \theta)) u'_{c_A} = E[u'_T]$$

where u'_{c_N} and u'_{c_A} are marginal utilities of consumption in non-audited and audited states

Dwenger et al. (2016): Model

- ▶ Intensive margin comparative statics: $p \uparrow \rightarrow z \uparrow$ for evaders, no effect on donors
- ▶ Extensive margin: $s < \bar{s}_1 \rightarrow$ evader; $\bar{s}_1 \leq s \leq \bar{s}_2 \rightarrow$ complier; $\bar{s}_2 < s \rightarrow$ donor. Cutoffs satisfy

$$\frac{u'_T(\bar{z} - T(\bar{z}), T(\bar{z}), \bar{s}_1)}{u'_c(\bar{z} - T(\bar{z}), T(\bar{z}), \bar{s}_1)} = 1 - p(1 + \theta)$$
$$\frac{u'_T(\bar{z} - T(\bar{z}), T(\bar{z}), \bar{s}_2)}{u'_c(\bar{z} - T(\bar{z}), T(\bar{z}), \bar{s}_2)} = 1$$

- ▶ Comparative statics: $p \uparrow \rightarrow \bar{s}_1 \downarrow$, no effect on $\bar{s}_2 \Rightarrow$ fewer evaders, more compliers

Dwenger et al. (2016): Experiment

- ▶ Experiment with 11 (!) treatment arms
 - T1. Control
- ▶ Tax Simplification and misperceptions
 - T2. Shorter, clearer message. Legal obligation, payment deadlines and schedule more salient
 - T3. T2 + paragraph saying $p = 0$
- ▶ Deterrence
 - T4. T2 + $p = 0.1$
 - T5. T2 + $p = 0.2$
 - T6. T2 + $p = 0.5$
 - T7. T2 + $p = 0.5$ if pay less than €10

Dwenger et al. (2016): Experiment

► Compliance Rewards

T8. T2 + social recognition (in newspaper) of timely compliance

T9. T2 + private raffle for €250

T10. T2 + private raffle for €1,000

T11. T2 + newspaper + €1,000 raffle

Dwenger et al. (2016): Analysis

- ▶ Data. Link church records (z) with tax records (\bar{z}) on 39,782 individuals
- ▶ Extensive margin: Estimate LPM

$$\Pr(i \text{ evades}) = \alpha + \beta I \{T_i = j\} + \pi E_{i,pre} + \lambda_S + u_i$$

where $I \{T_i = j\}$ indicates treatment j , $E_{i,pre}$ denotes evasion in previous years, λ_s are stratum FEs

- ▶ Total responses

$$y_i = \delta + \gamma I \{T_i = j\} + \theta \bar{y}_{i,pre} + \lambda_s + \varepsilon_i$$

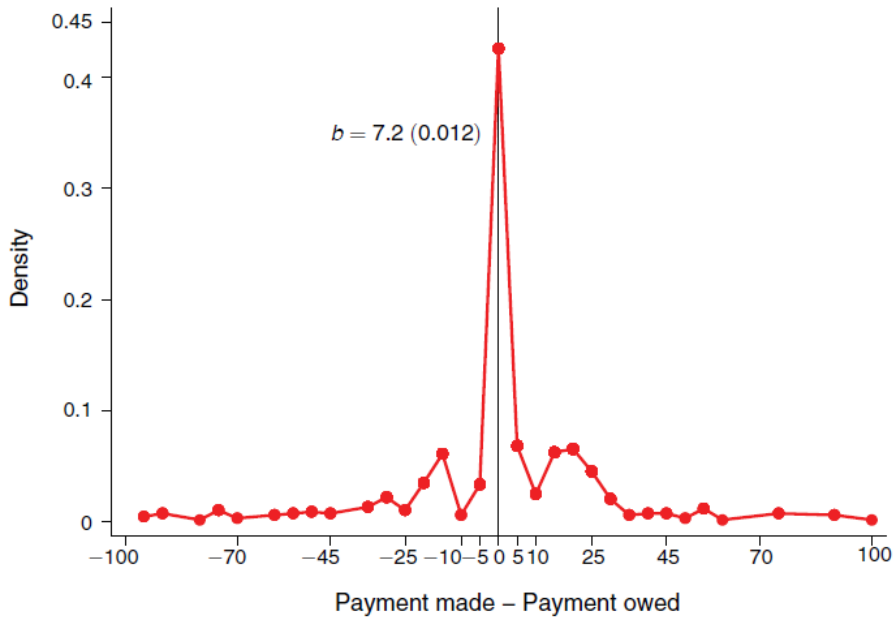
where $\bar{y}_{i,pre}$ is average pre-treatment tax

TABLE 1—COMPLIANCE UNDER ZERO DETERRENCE

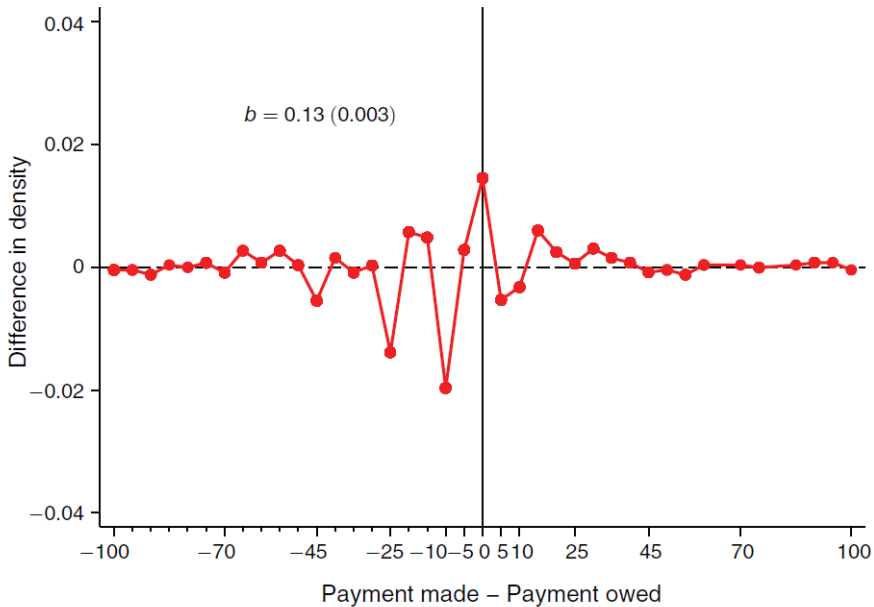
Control group, means	Full sample (1)	Evaders (extrinsically motivated) (2)	Compliers/donors (intrinsically motivated) (3)
Number of individuals	2,532	2,004	528
Percentage of all individuals	100%	79.1%	20.9%
Full evaders	72.7%	91.9%	—
Partial evaders	6.4%	8.08%	—
Compliers	11.6%	—	55.5%
Donors	9.3%	—	44.5%
Payment amount	€10.32	€1.87	€42.40

Notes: The sample of individuals are all those assigned to the T1 control group in 2012 (2,532 individuals). The column headings refer to behavior in 2012, the year of the field experiment. Evaders are defined as those who pay strictly less than their legal tax liability, compliers are those who pay exactly their legal tax liability, and donors are those who pay strictly more than their legal tax liability.

Panel A. Bunching at exact compliance (duty-to-comply) control letter



Panel B. Duty-to-comply versus attention simplification letter—control letter



Control group, means	Full sample			
	Probability of evading (1)	Probability of donating (2)	Payment amount (3)	Probability of payment increase (4)
<i>Panel A. Tax simplification</i>				
Simplification versus control				
Effect of tax simplification	-2.45 (0.971)	-0.438 (6.90)	9.73 (3.73)	33.61 (10.25)
Average outcome in comparison group	79.29%	9.24%	€10.29	7.89%
Observations	5,076	5,076	5,076	5,076
<i>Panel B. Misperception</i>				
Zero audit probability versus simplification				
Effect of correcting misperception	0.942 (0.889)	-7.23 (5.65)	-0.766 (3.05)	-10.60 (6.75)
Average outcome in comparison group	77.30%	9.75%	€11.65	10.92%
Observations	7,641	7,641	7,641	7,641
<i>Panel C. Deterrence</i>				
Positive audit probability versus zero audit probability				
Effect of deterrence	-3.13 (0.660)	13.71 (4.59)	10.45 (2.37)	26.93 (5.84)
Average outcome in comparison group	78.04%	8.93%	€11.63	9.42%
Observations	12,692	12,692	12,692	12,692
<i>Panel D. Compliance rewards</i>				
Reward versus simplification				
Effect of compliance rewards	0.259 (0.821)	-0.040 (5.23)	1.24 (2.86)	-9.48 (6.21)
Average outcome in comparison group	77.30%	9.75%	€11.65	10.92%
Observations	12,632	12,632	12,632	12,632

	Baseline evaders (extrinsically motivated)				Baseline donors (intrinsically motivated)			
	Probability of evading (5)	Probability of donating (6)	Payment amount (7)	Probability of payment increase (8)	Probability of evading (9)	Probability of donating (10)	Payment amount (11)	Probability of payment increase (12)
<i>Panel A. Tax simplification</i>								
Simplification versus control								
Effect of tax simplification	-2.66 (0.747)	6.58 (22.86)	43.40 (10.60)	64.82 (13.69)	-5.25 (19.67)	-4.04 (6.97)	-6.65 (4.85)	-37.29 (19.38)
Average outcome in comparison group	94.98%	1.91%	€3.13	6.12%	17.32%	62.34%	€39.94	15.58%
Observations	4,007	4,007	4,007	4,007	476	476	476	476
<i>Panel B. Misperception</i>								
Zero audit probability versus simplification								
Effect of correcting misperception	1.53 (0.715)	-8.89 (17.47)	-9.83 (6.75)	-11.03 (7.55)	-16.75 (17.63)	1.52 (5.78)	8.79 (4.78)	32.37 (28.02)
Average outcome in comparison group	92.35%	2.18%	€4.84	10.53%	15.92%	61.63%	€40.16	8.57%
Observations	6,049	6,049	6,049	6,049	723	723	723	723
<i>Panel C. Deterrence</i>								
Positive audit probability versus zero audit probability								
Effect of deterrence	-3.12 (0.536)	36.89 (15.22)	33.67 (6.28)	29.81 (6.64)	-0.093 (15.48)	7.07 (4.22)	2.10 (3.25)	30.85 (19.16)
Average outcome in comparison group	93.80%	1.93%	€4.05	9.00%	12.55%	61.72%	€45.08	10.67%
Observations	9,979	9,979	9,979	9,979	1,261	1,261	1,261	1,261
<i>Panel D. Compliance rewards</i>								
Reward versus simplification								
Effect of compliance rewards	1.27 (0.664)	5.24 (16.17)	-5.46 (6.33)	-15.58 (6.90)	-11.64 (15.11)	2.02 (4.95)	4.87 (3.83)	48.34 (25.27)
Average outcome in comparison group	92.35%	2.18%	€4.84	10.53%	15.92%	61.63%	€40.16	8.57%
Observations	9,909	9,909	9,909	9,909	1,247	1,247	1,247	1,247

	Full sample			
	Probability of evading (1)	Probability of donating (2)	Payment amount (3)	Probability of payment increase (4)
<i>Panel A. Deterrence</i>				
Positive audit probability versus zero audit probability				
Deterrence, pooled effect	-2.45 (0.971)	-0.438 (6.90)	9.73 (3.73)	33.61 (10.25)
Deterrence, individual effects				
Audit probability = 0.1	-3.29 (0.898)	5.38 (6.08)	9.52 (3.20)	29.76 (8.05)
Audit probability = 0.2	-3.11 (0.923)	17.61 (6.44)	11.48 (3.37)	26.81 (8.11)
Audit probability = 0.5	-2.99 (0.912)	18.27 (6.31)	10.38 (3.30)	24.17 (8.01)
Average outcome in comparison group	78.04%	8.93%	€11.63	9.42%
Observations	12,692	12,692	12,692	12,692
<i>Panel B. Compliance rewards</i>				
Reward versus simplification				
Compliance rewards, pooled effect	0.259 (0.821)	-0.040 (5.23)	1.24 (2.86)	-9.48 (6.21)
Compliance rewards, individual effects				
Social reward	0.185 (1.03)	2.97 (6.68)	0.245 (3.51)	-11.60 (7.71)
Small private reward	0.450 (1.03)	-4.59 (6.74)	-1.15 (3.56)	-10.88 (7.74)
Large private reward	1.02 (1.00)	-3.30 (6.60)	2.12 (3.98)	-15.30 (7.63)
Social and private reward combined	-0.618 (1.04)	4.75 (6.57)	3.74 (3.73)	-0.15 (7.89)
Average outcome in comparison group	77.30%	9.75%	€11.65	10.92%
Observations	12,632	12,632	12,632	12,632

	Baseline evaders (extrinsically motivated)				Baseline donors (intrinsically motivated)			
	Probability of evading (5)	Probability of donating (6)	Payment amount (7)	Probability of payment increase (8)	Probability of evading (9)	Probability of donating (10)	Payment amount (11)	Probability of payment increase (12)
<i>Panel A. Deterrence</i>								
Positive audit probability versus zero audit probability								
Deterrence, pooled effect	-2.66 (0.747)	6.58 (22.86)	43.40 (10.60)	64.82 (13.69)	-5.25 (19.67)	-4.04 (6.97)	-6.65 (4.85)	-37.29 (19.38)
Deterrence, individual effects								
Audit probability = 0.1	-3.09 (0.741)	14.43 (19.43)	31.69 (8.73)	34.91 (9.19)	15.80 (21.44)	-2.07 (5.76)	2.91 (4.38)	41.68 (26.31)
Audit probability = 0.2	-3.60 (0.773)	44.22 (21.67)	42.19 (8.89)	29.86 (9.17)	7.45 (19.63)	10.92 (5.39)	-0.544 (3.94)	22.62 (23.67)
Audit probability = 0.5	-2.69 (0.749)	52.86 (22.28)	27.48 (9.23)	24.55 (9.10)	-25.90 (21.44)	12.08 (5.66)	4.41 (4.11)	29.25 (26.60)
Average outcome in comparison group	93.80%	1.93%	€4.05	9.00%	12.55%	61.72%	€45.08	10.67%
Observations	9,979	9,979	9,979	9,979	1,261	1,261	1,261	1,261
<i>Panel B. Compliance rewards</i>								
Reward versus simplification								
Compliance rewards, pooled effect	1.27 (0.664)	5.24 (16.17)	-5.46 (6.33)	-15.58 (6.90)	-11.64 (15.11)	2.02 (4.95)	4.87 (3.83)	48.34 (25.27)
Compliance rewards, individual effects								
Social reward	1.02 (0.824)	17.93 (21.07)	-6.38 (7.99)	-16.84 (8.57)	-11.96 (19.62)	3.17 (6.35)	3.50 (4.66)	40.87 (34.04)
Small private reward	1.22 (0.825)	2.66 (20.60)	-10.10 (7.87)	-17.50 (8.50)	-11.95 (18.48)	-4.56 (6.32)	5.15 (4.57)	56.00 (32.76)
Large private reward	2.09 (0.794)	-7.38 (19.69)	-10.57 (7.59)	-21.24 (8.34)	-4.55 (19.25)	2.72 (6.32)	3.16 (5.08)	35.00 (32.38)
Social and private reward combined	0.777 (0.841)	7.66 (20.47)	4.93 (8.34)	-6.95 (8.75)	-18.58 (20.02)	7.38 (6.37)	7.89 (5.24)	62.16 (34.60)
Average outcome in comparison group	92.35%	2.18%	€4.84	10.53%	15.92%	61.63%	€40.16	8.57%
Observations	9,909	9,909	9,909	9,909	1,247	1,247	1,247	1,247

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Tax Evasion: Theory and Evidence from Rich Countries

Dwenger, Kleven, Rasul & Rincke (AEJ:Pol 2016) *Extrinsic and Intrinsic Motivations for Tax Compliance: Evidence from a Field Experiment in Germany*

Alstadsæter, Johannesen & Zucman (WP 2018) *Tax Evasion and Tax Avoidance*

Alstadsæter et al. (2018): Overview

- ▶ Companion to the AER paper.
- ▶ Look at how amnesties affect reporting.
- ▶ Look in particular for effects on switching between illegal (evasion) and legal (avoidance) strategies to reduce tax liability

Alstadsæter et al. (2018): Substitution to Avoidance?

- ▶ Event study approach.
- ▶ Sample:
 - ▶ All Amnesty users
 - ▶ All non-disclosers in top 10% and random 10% of the other 90%
- ▶ Estimate

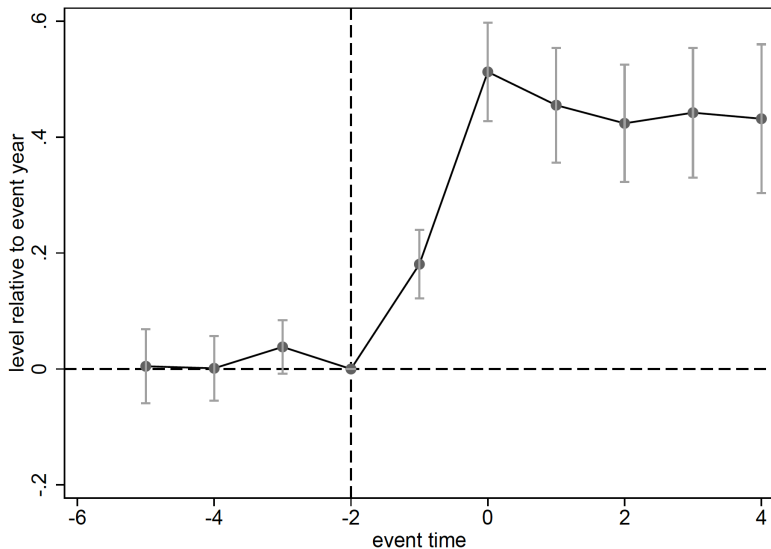
$$\log(Y_{it}) = \alpha_i + \gamma_t + X'_{it}\psi + \sum \beta_k D_{it}^k + u_{it}$$

where α_i , γ_t are indiv/yr FEs, X_{it} contains wealth, income, age groups and D_{it}^k are event-time (year - year used amnesty) dummies

- ▶ Omitted year is $t - 2$ since assets disclosed can be incorporated into $t - 1$ return.

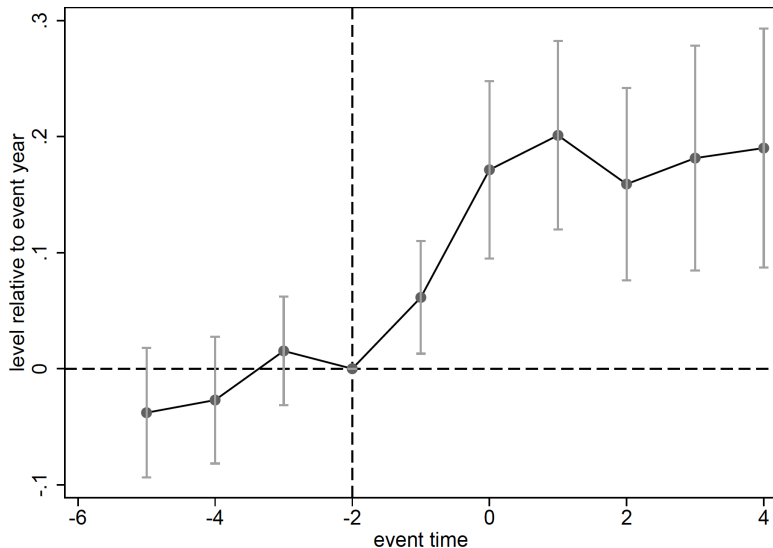
Alstadsæter et al. (2018): Event Study-Wealth

Panel A: Impact on reported wealth



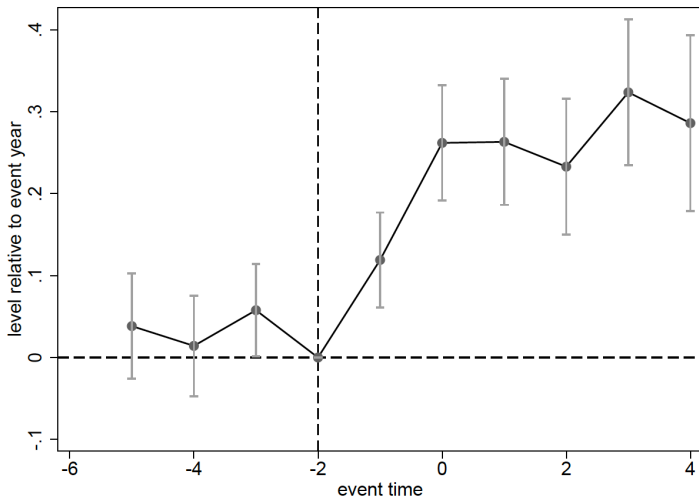
Alstadsæter et al. (2018): Event Study-Income

Panel B: Impact on reported income



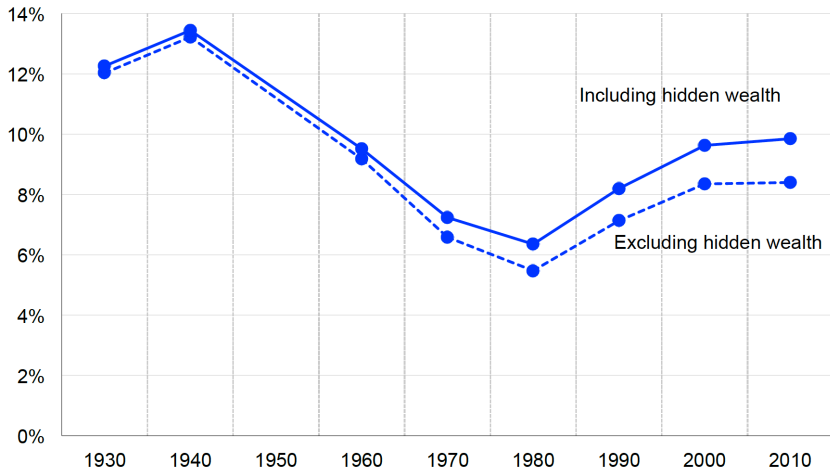
Alstadsæter et al. (2018): Event Study-Taxes

Figure 10: The impact of using a tax amnesty on taxes paid



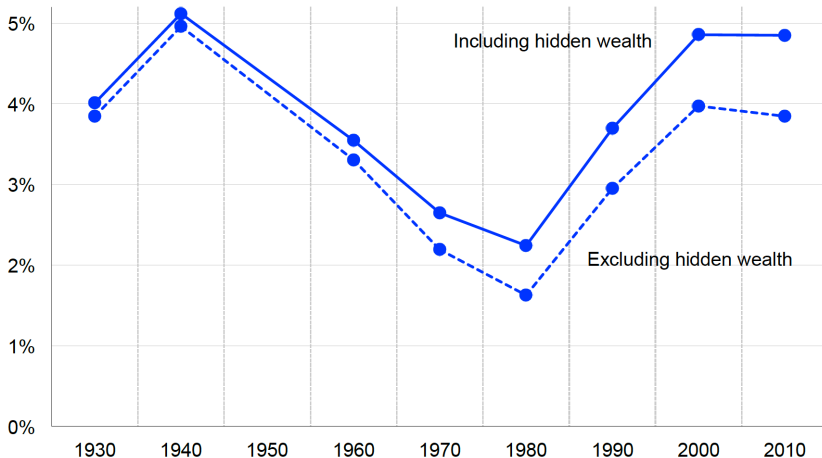
Alstadsæter et al. (2018): Implication for Measured Wealth Inequality

Top 0.1% wealth share in Norway



Alstadsæter et al. (2018): Implication for Measured Wealth Inequality

Top 0.01% wealth share in Norway



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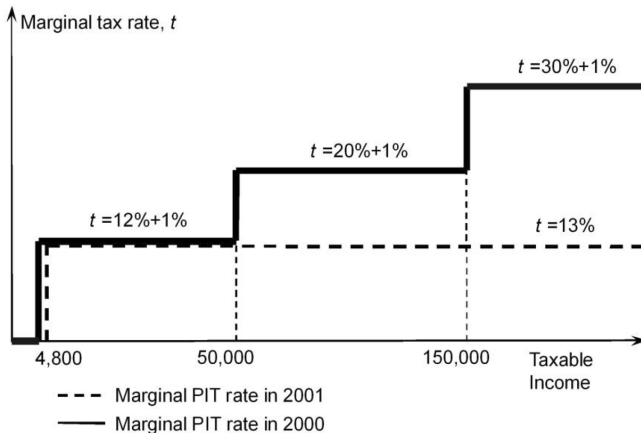
Outline

Taxing Individuals in Developing Countries

Gorodnichenko, Martinez-Vazquez & Peters (JPE 2009) *Myth and Reality of Flat Tax Reform*

Gorodnichenko et al. (2009): Overview

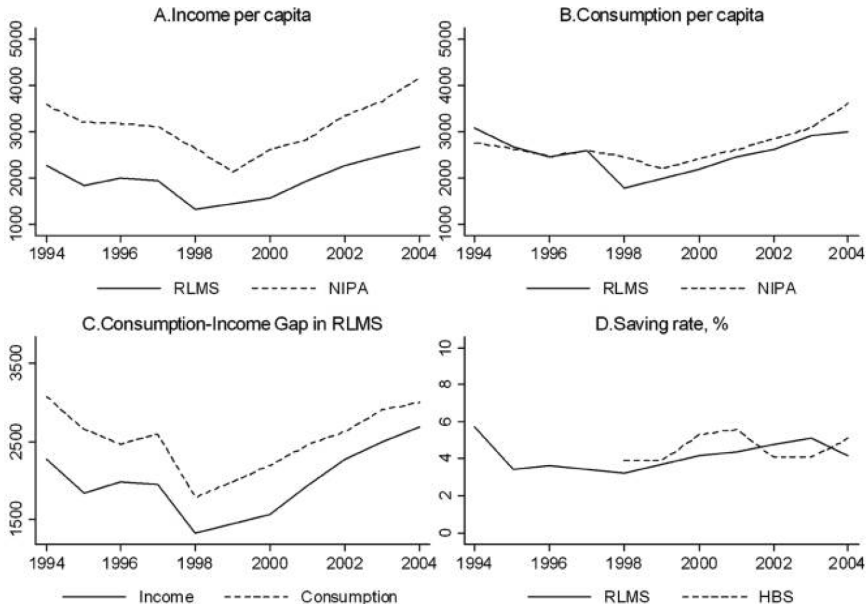
- ▶ In 2001 Russia replaces progressive income tax with a flat one
- ▶ Use household survey data and D-i-D approach to estimate evasion response
- ▶ Measure of evasion: Gap between income and consumption



Gorodnichenko et al. (2009): Data

- ▶ Use 1998 and 2000-2004 waves of Russian Longitudinal Monitoring Survey (RLMS)
- ▶ Detailed consumption data on last 30 days' consumption
 - ▶ 50+ food items
 - ▶ alcohol & tobacco
 - ▶ clothes, fuel
 - ▶ entertainment, education...
- ▶ Combine these into “nondurable expenditures” C1
- ▶ Add in transfers to other households (alimony etc.) → C2
- ▶ All hh members' income in money, goods, in kind → Y1
- ▶ Add in lump-sum payments in last 30 days → Y2
- ▶ Add in income from selling agricultural output → Y3

Gorodnichenko et al. (2009): Aggregate Comparison



Gorodnichenko et al. (2009): Conceptual Framework

- ▶ Let household h 's true income at time t be Y_{ht}^*
- ▶ However, reported income is only $Y_{ht}^R = \Gamma_{ht} Y_{ht}^*$
- ▶ Model misreporting as $\Gamma(S_{ht}) = \exp(-\gamma S_{ht} + \text{error})$ where S_{ht} includes job, worker characteristics, government policies
- ▶ Model true income as $Y_{ht}^* = H_{ht} Y_{ht}^P$ where Y_{ht}^P is permanent income
- ▶ $H_{ht} = H(X_{1,ht}) = \exp(\eta X_{1,ht} + \text{error})$ where $X_{1,ht}$ captures life-cycle factors like age, schooling employment, #children etc.

Gorodnichenko et al. (2009): Conceptual Framework

- ▶ Model expenditure on non-durables as $C_{ht} = \Theta_{ht} Y_{ht}^P$
- ▶ Where $\Theta_{ht} = \Theta(X_{2,ht}) = \exp(\theta X_{2,ht} + \text{error})$ where $X_{2,ht}$ contains # of hh members, # of children, age, schooling etc.
- ▶ Together these assumptions imply

$$\ln Y_{ht}^R - \ln Y_{ht}^* = -\gamma S_{ht} + \text{error}$$

$$\ln Y_{ht}^* - \ln Y_{ht}^P = \eta X_{1,ht} + \text{error}$$

$$\ln C_{ht} - \ln Y_{ht}^P = \theta X_{2,ht} + \text{error}$$

- ▶ Don't observe Y_{ht}^* or Y_{ht}^P , but combining assumptions

$$\ln C_{ht} - \ln Y_{ht}^R = \gamma S_{ht} + \beta X_{ht} + u_h + \varepsilon_{ht}$$

where X_{ht} combines $X_{1,ht}$ and $X_{2,ht}$

TAX EVASION FUNCTION, FIXED EFFECTS

	ln C1 – ln Y1	ln C2 – ln Y1	ln C1 – ln Y2	ln C2 – ln Y2
Panel A				
Number of household members	-.010 (.013)	-.033** (.013)	.018 (.013)	-.005 (.013)
Number of senior household members, 60+	-.210*** (.022)	-.200*** (.022)	-.180*** (.022)	-.169*** (.022)
Number of children in house- hold (<18)	.088*** (.022)	.076*** (.022)	.034 (.021)	.023 (.021)
Year = 1998	-.026 (.020)	-.025 (.020)	-.026 (.020)	-.025 (.020)
Year = 2001	-.142*** (.017)	-.139*** (.017)	-.140*** (.018)	-.137*** (.018)
Year = 2002	-.221*** (.018)	-.213*** (.018)	-.216*** (.018)	-.208*** (.018)
Year = 2003	-.208*** (.018)	-.203*** (.018)	-.217*** (.018)	-.213*** (.018)
Year = 2004	-.268*** (.018)	-.262*** (.018)	-.265*** (.018)	-.260*** (.018)

Household head characteristics:

Age	−.004*** (.001)	−.004*** (.001)	−.002** (.001)	−.001* (.001)
Years of schooling	−.006 (.004)	−.004 (.004)	−.007* (.004)	−.005 (.004)
Married	−.093*** (.024)	−.087*** (.024)	−.060** (.023)	−.053** (.023)
Currently works	−.298*** (.055)	−.278*** (.054)	−.151*** (.052)	−.130** (.052)
Years of tenure	.003** (.001)	.003*** (.001)	.002* (.001)	.002** (.001)
Works at enterprise	−.076* (.046)	−.083* (.045)	−.081* (.044)	−.089** (.044)
Works in private sector	−.105*** (.021)	−.105*** (.021)	−.085*** (.021)	−.084*** (.021)
Log (firm size)	−.020*** (.006)	−.019*** (.006)	−.016*** (.006)	−.015*** (.006)
Observations (households)	24,129 (6,135)	24,129 (6,135)	24,723 (6,202)	24,723 (6,202)
R^2 overall	.05	.04	.03	.03

Panel B

After-reform trend (2001 = 1)	−.067*** (.005)	−.066*** (.005)	−.066*** (.005)	−.065*** (.005)
-------------------------------	--------------------	--------------------	--------------------	--------------------

Gorodnichenko et al. (2009): Evasion and Perceptions

TABLE 3
CONSUMPTION-INCOME GAP AND ATTITUDES TOWARD TAXES, 1998 AND 2002

	ln C1 – ln Y1	ln C2 – ln Y1	ln C1 – ln Y2	ln C2 – ln Y2
Evasion perception index (at the district level; 38 PSUs)	.244** (.119)	.246** (.119)	.368*** (.118)	.370*** (.118)
Year = 2002	–.173*** (.020)	–.162*** (.020)	–.170*** (.020)	–.160*** (.020)
Observations	7,539	7,539	7,806	7,806
R^2	.09	.07	.05	.04

Gorodnichenko et al. (2009): Diff in Diff

- To estimate impact of 2001 reform. Diff in Diff strategy

$$\ln C_{ht} - \ln Y_{ht}^R = \gamma S_{ht} + \beta X_{ht} + \mu d_{ht}^{\text{treat}} + \alpha (d_{ht}^{\text{treat}} \times D_p) + \psi D_p + u_h + \varepsilon_{ht}$$

where $d_{ht}^{\text{treat}} = I\{\tau_{ht} < \tau_{ht-1}\}$ and D_p indicates post-reform years

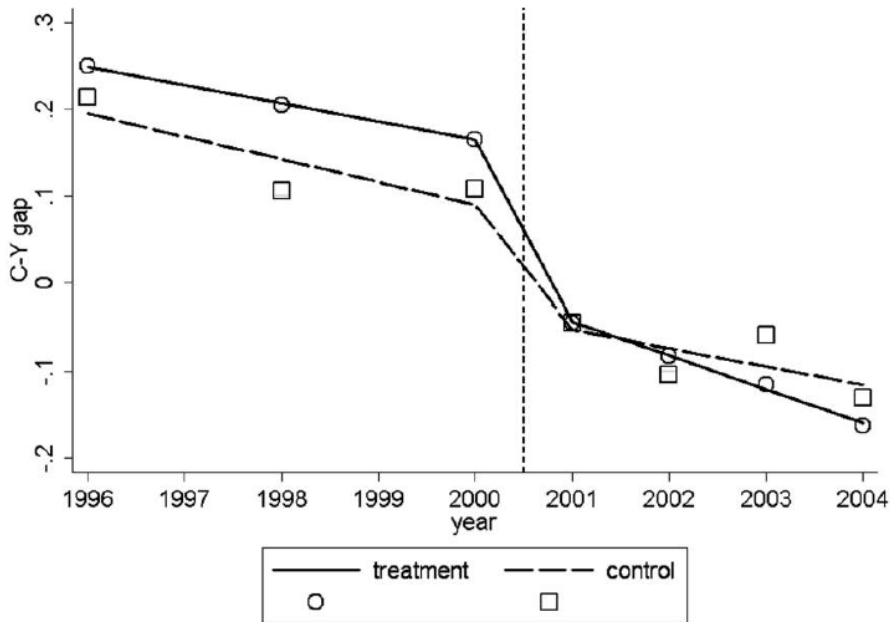
- Note, potential endogeneity of d_{ht}^{treat} . Income choices put people in range to be affected. Instead, use post-reform income. Tax is flat, so no tax reasons to locate above or below threshold
- Transitory fluctuations in Y also an issue: Instead use 4-year average of contractual earnings to assign treatment.

TAX EVASION FUNCTION: DIFFERENCE-IN-DIFFERENCE APPROACH, FIXED EFFECTS

	ln C1 – ln Y1	ln C2 – ln Y1	ln C1 – ln Y2	ln C2 – ln Y2
Number of household members	–.016 (.014)	–.037*** (.014)	.014 (.014)	–.007 (.014)
Number of senior household members, 60+	–.181*** (.027)	–.173*** (.027)	–.159*** (.026)	–.152*** (.026)
Number of children in house- hold, <18	.087*** (.022)	.077*** (.022)	.034 (.022)	.024 (.022)
Year = 1998	–.020 (.025)	–.016 (.025)	–.028 (.025)	–.025 (.025)
Year = 2002	–.073*** (.020)	–.068*** (.020)	–.072*** (.020)	–.066*** (.019)
Year = 2003	–.076*** (.020)	–.073*** (.020)	–.080*** (.019)	–.077*** (.019)
Year = 2004	–.136*** (.021)	–.129*** (.021)	–.128*** (.020)	–.120*** (.020)
Household head characteristics:				
Age	–.004*** (.001)	–.003*** (.001)	–.002** (.001)	–.001 (.001)

Years of schooling	-.007 (.005)	-.006 (.005)	-.010** (.005)	-.009* (.005)
Married	-.070*** (.027)	-.071*** (.027)	-.031 (.026)	-.030 (.026)
Currently works	-.293*** (.055)	-.277*** (.055)	-.158*** (.052)	-.142*** (.051)
Years of tenure	.002* (.001)	.002* (.001)	.001 (.001)	.002 (.001)
Works at enterprise	-.083* (.046)	-.084* (.046)	-.081* (.043)	-.083* (.043)
Works in private sector	-.100*** (.021)	-.099*** (.021)	-.085*** (.021)	-.083*** (.021)
Log (firm size)	-.019*** (.006)	-.018*** (.006)	-.014** (.006)	-.013** (.006)
After-reform dummy (D_p)	-.103*** (.031)	-.104*** (.031)	-.106*** (.031)	-.107*** (.031)
$d^{\text{treat}} \times D_p$	-.109*** (.033)	-.108*** (.033)	-.105*** (.033)	-.102*** (.033)
Observations (households)	17,081 (4,174)	17,081 (4,174)	17,444 (4,184)	17,444 (4,184)
R^2 overall	.06	.05	.04	.04

Gorodnichenko et al. (2009): Results



Gorodnichenko et al. (2009): Heterogeneity

TREATMENT EFFECT IN THE DIFFERENCE-IN-DIFFERENCE APPROACH: HETEROGENEOUS RESPONSE

Alternative Specifications	ln C1 – ln Y1	ln C2 – ln Y1	ln C1 – ln Y2	ln C2 – ln Y2
State vs. public sector:				
$d^{\text{treat}} \times D_p$ (state sector is omitted)	.001 (.054)	-.017 (.054)	-.014 (.052)	-.030 (.052)
$d^{\text{treat}} \times D_p \times \text{private}$	-.229*** (.080)	-.192** (.080)	-.236*** (.079)	-.201** (.079)
Observations	17,287	17,287	17,684	17,684
Blue collar vs. white collar:				
$d^{\text{treat}} \times D_p \times \text{private}$ (blue-collar workers are omitted)	-.111 (.103)	-.073 (.103)	-.133 (.099)	-.097 (.099)
$d^{\text{treat}} \times D_p \times \text{private} \times \text{white}$ collar	-.302** (.123)	-.308** (.125)	-.295** (.124)	-.297** (.124)
Observations	17,287	17,287	17,684	17,684

Gorodnichenko et al. (2009): Welfare

- Use the setup in Chetty (2009) to characterize DWL

Deadweight loss,

$$DWL_W =$$

$$-0.5t\epsilon_w/[1 - (e/wl)]$$

(% taxable income)

Point estimate, DWL_W^M

2.17%

1.41%

Lower bound, DWL_W^L

X

.64%

Upper bound, DWL_W^U

X

2.17%

NOTE.—See Sec. VII for details on notation and definitions.

Outline

Taxation in Developing Countries: Big Picture

Tax Evasion: Theory and Evidence from Rich Countries

Taxing Individuals in Developing Countries

Taxing Firms in Developing Countries

International Taxation and Developing Countries

Outline

Taxing Firms in Developing Countries

Benhassine, McKenzie, Pouliquen & Santini (JPubE 2018)

Does Inducing Informal Firms to Formalize Make Sense?

Experimental Evidence From Benin

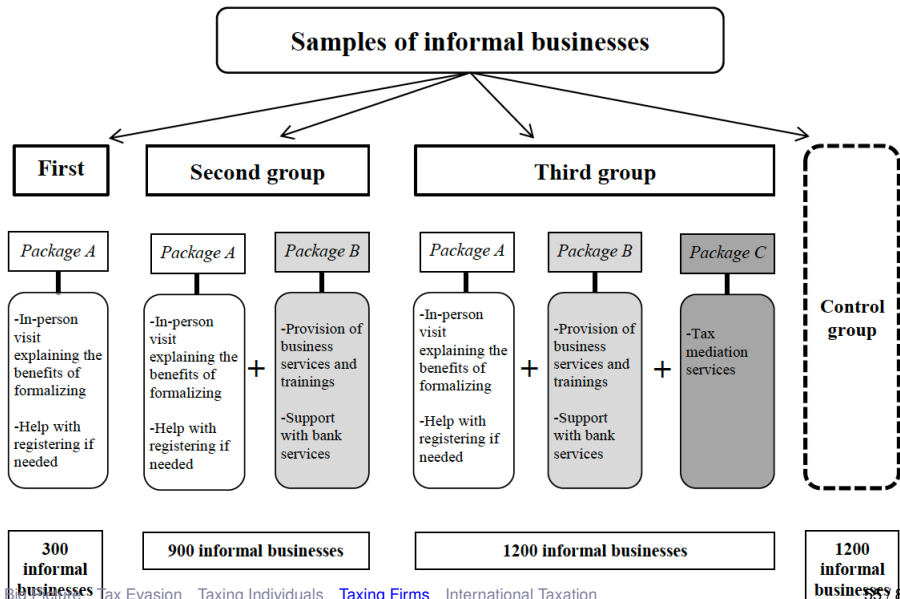
Benhassine et al (2018): Overview

- ▶ Informality is widespread in the developing world (LaPorta & Shleifer 2014)
 - ▶ Costly for firms: Can't access finance, public contracts etc. (de Soto, 1989)
 - ▶ Costly for governments: Lose tax revenues.
- ▶ Governments have tried many things to get firms to formalize, but with little success. Should they try harder?
- ▶ Conduct experiment in Benin around introduction of simplified legal status "*entreprenant*"
- ▶ Conclude:
 - ▶ Costs of inducing formalization outweigh benefits to govt and firm
 - ▶ Better targeting can tip the balance a bit.

Benhassine et al (2018): Context

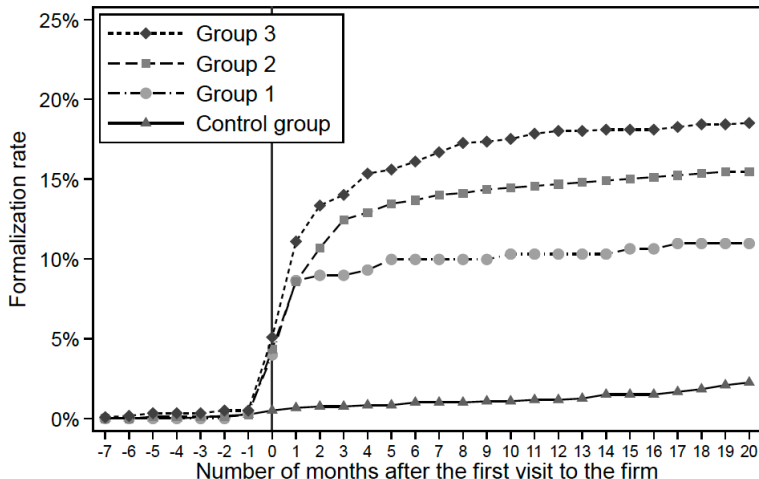
- ▶ Experiment in Benin: ~70% of GDP and 95% of employment is informal
- ▶ In 2011 introduced *entreprenant* legal status. Simplified legal regime for small businesses.
 - ▶ one-stop shop for registration
 - ▶ Free to register
 - ▶ Only require legal ID, a short form, 2 photos
- ▶ 4 treatment arms:
 1. Information and assistance to register.
 - 1.1 Send advisors (MA & experience) to explain benefits, leave leaflets.
 - 1.2 Help at the office when registering
 2. Treatment 1 + business training workshops, help opening a bank account.
 3. Treatment 2 + mediation and tax counseling.
 4. Control

Benhassine et al (2018): Experimental Design



Benhassine et al (2018): Formalization

Figure 1: Formalization Rates over Time



Notes: N=3,596

For the control group, date of visit 1 is set at the mode of the visit 1 date for other firms (3 months after program start)

Benhassine et al (2018): Formalization

Table 3: Impact on Formalization

	(1)	(2)	(3)	(4)	(5)
<i>Dependent variables:</i>		Declared		Declared	Showed a
	Admin.	that the		formality or	document or
	Data	business is	Showed a	found in	found in
	(GUFE)	formal	document	admin. data	admin. data
Group 1	0.096*** (0.023)	0.066** (0.026)	0.069*** (0.024)	0.107*** (0.029)	0.130*** (0.029)
Group 2	0.130*** (0.014)	0.108*** (0.017)	0.093*** (0.015)	0.143*** (0.018)	0.146*** (0.018)
Group 3	0.163*** (0.013)	0.128*** (0.015)	0.120*** (0.013)	0.176*** (0.016)	0.181*** (0.016)
Observations	3,596	3,061	2,929	3,061	2,929
R-squared	0.392	0.436	0.453	0.446	0.464
Adjusted R-squared	0.086	0.072	0.075	0.090	0.094
Mean dependent variable in Control	0.023	0.052	0.026	0.059	0.040
Pvalue Test Group1=Group2	0.175	0.153	0.353	0.257	0.602
Pvalue Test Group1=Group3	0.003	0.017	0.028	0.015	0.075
Pvalue Test Group2=Group3	0.022	0.211	0.066	0.068	0.057
Pvalue Test Group1=Group2=Group3	0.002	0.037	0.026	0.016	0.049
Pvalue Test Group1=Group2=Group3=0	0.000	0.000	0.000	0.000	0.000

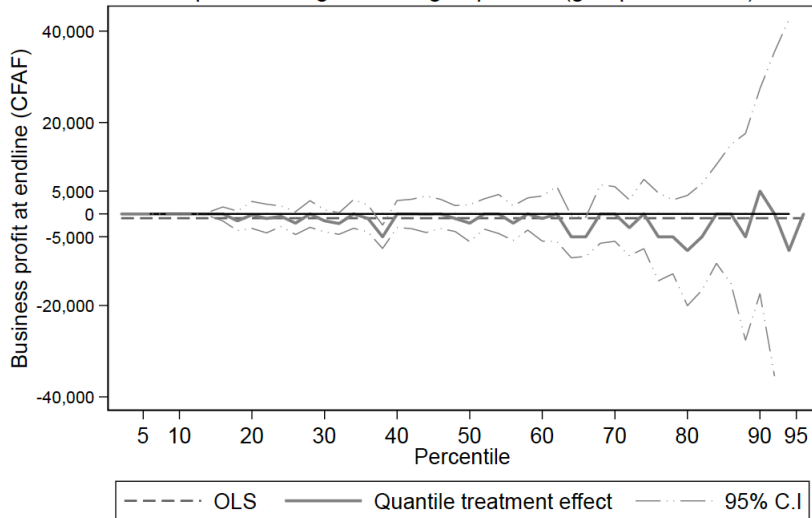
Benhassine et al (2018): Firm Performance

Table 5 : Impact on Firm Performances

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total sales in the last day ^{aβ}	Total sales in the last week ^{aβ}	Last month profit ^{aβ}	Summary index of sales and profit ^{aβ}	Total number of employees ^a	Any tax paid for business activity in 2015 ^B	Sum of all taxes paid in 2015 ^B
	(CFAF)	(CFAF)	(CFAF)			2015 ^B	(CFAF)
1st stage: impact of treatment allocation:							
Group1 X year1 (b1)	2,228 (2,754)	12,496 (14,029)	-8,053* (4,798)	0.008 (0.057)	-0.22** (0.10)	0.013 (0.030)	-19 (1,747)
Group2 X year1 (b2)	540 (1,451)	-7,376 (7,312)	-3,016 (3,021)	-0.052* (0.031)	-0.06 (0.09)	0.048*** (0.018)	-51 (1,091)
Group3 X year1 (b3)	-114 (1,384)	-1,224 (6,399)	-3,106 (2,858)	-0.010 (0.030)	-0.11 (0.08)	0.005 (0.016)	-2,041** (949)
Group1 X year2 (c1)	602 (2,930)	12,192 (14,243)	470 (5,742)	0.041 (0.060)	-0.09 (0.10)	-0.066** (0.030)	-3,308** (1,678)
Group2 X year2 (c2)	1,246 (1,832)	-5,235 (8,010)	-874 (3,377)	-0.007 (0.036)	0.05 (0.07)	-0.055*** (0.018)	-3,413*** (1,047)
Group3 X year2 (c3)	1,847 (1,669)	3,998 (7,911)	242 (3,233)	0.026 (0.035)	0.08 (0.07)	-0.067*** (0.017)	-5,967*** (869)

Benhassine et al (2018): Firm Performance

Impact of assignment to group 2 or 3 (group1 excluded)



Notes: Data source: Endline surveys 2016, N=2905

Benhassine et al (2018): Total Costs

Table 6: Cost Effectiveness Analysis

	In CFAF			In USD		
	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
Program costs:						
Total Program costs	21,304,850	154,397,653	195,493,401	35,746	259,056	328,009
<u><i>Costs by intervention:</i></u>						
One-stop-shop for formalization	6,325,293	18,975,879	25,301,172	10,613	31,839	42,452
Interventions to increase take up	14,979,557	135,421,774	170,192,229	25,133	227,218	285,557
<u><i>Costs by types:</i></u>						
Total set up costs	5,728,222	36,001,489	45,733,290	9,611	60,405	76,734
Total variable costs	15,576,628	118,396,164	149,760,111	26,135	198,651	251,275

Benhassine et al (2018): Cost-Effectiveness

Cost per formalization

Number of businesses	301	899	1199	301	899	1199
<i>Program impact:</i>						
Impact on formalization (in pp)	9.6%	13.0%	16.3%	9.6%	13.0%	16.3%
Number of firms which formalized because of the program	29	117	195	29	117	195
<i>Total costs...</i>						
... per business included in treatment	70,780	171,744	163,047	119	288	274
... per formalization	737,294	1,321,106	1,000,289	1,237	2,217	1,678
<i>Variable costs...</i>						
... per business included in treatment	51,750	131,698	124,904	87	221	210
... per formalization	539,058	1,013,059	766,283	904	1,700	1,286
Cost effectiveness						
Expected increase in tax revenue (see appendix 5 for more details)	27,185	27,185	27,185	46	46	46
Number of years before tax revenue are greater than cost per formalization ^a	19	35	29	19	35	29

Benhassine et al (2018): Heterogeneous Treatment Effects

Table 7: Heterogeneous Impact on Formalization by Baseline Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variables:</i>	Formalized: GUF data							
	Female owner	Operates in Dantokpa market	Trader	Doesn't look like formal species	Index of business size below median	Does not have secondary education	One visit or fewer from tax inspectors	Female owner (sample restricted ^a)
<i>Variable for heterogeneous analysis:</i>								
<i>Impact in group [...] for heterogeneous variable=0</i>								
Group1	0.134*** (0.035)	0.105*** (0.026)	0.144*** (0.032)	0.125** (0.055)	0.085*** (0.032)	0.140*** (0.036)	0.124** (0.054)	0.168*** (0.045)
Group2	0.192*** (0.024)	0.151*** (0.016)	0.178*** (0.021)	0.224*** (0.035)	0.139*** (0.020)	0.175*** (0.024)	0.176*** (0.036)	0.232*** (0.031)
Group3	0.206*** (0.021)	0.179*** (0.014)	0.195*** (0.019)	0.231*** (0.032)	0.151*** (0.018)	0.218*** (0.022)	0.214*** (0.033)	0.216*** (0.027)
<i>Additional impact in group [...] for heterogeneous variable=1</i>								
Group1 x Heterogenous variable (int1)	-0.063 (0.046)	-0.048 (0.054)	-0.089** (0.045)	-0.036 (0.061)	0.022 (0.046)	-0.074 (0.049)	-0.035 (0.061)	-0.068 (0.072)
Group2 x Heterogenous variable (int2)	-0.096*** (0.029)	-0.100*** (0.034)	-0.086*** (0.028)	-0.115*** (0.039)	-0.017 (0.029)	-0.073** (0.033)	-0.056 (0.041)	-0.125*** (0.047)
Group3 x Heterogenous variable (int3)	-0.070*** (0.026)	-0.080*** (0.031)	-0.058** (0.025)	-0.083** (0.036)	0.022 (0.026)	-0.096*** (0.031)	-0.064* (0.038)	-0.052 (0.042)
Observations	3,596	3,596	3,596	3,596	3,596	3,596	3,596	1,619

Outline

Taxation in Developing Countries: Big Picture

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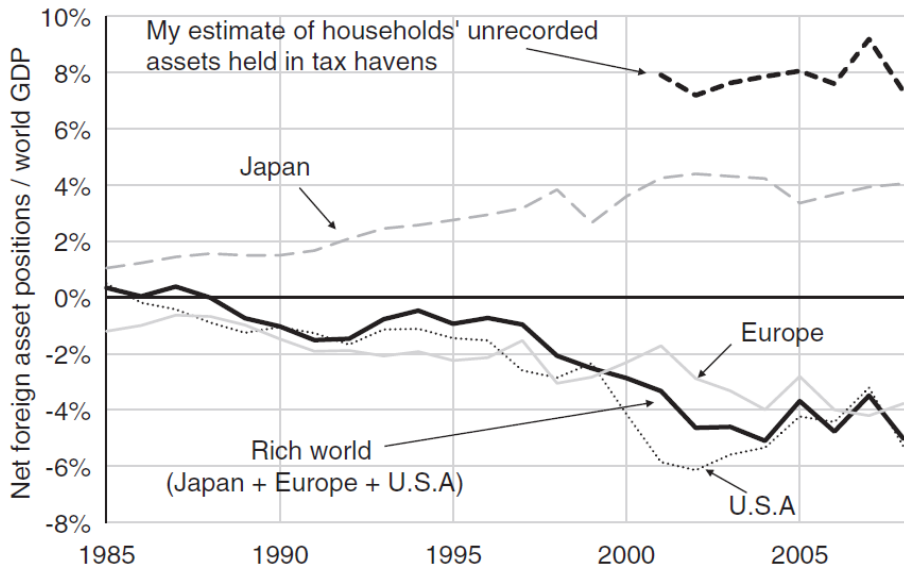
International Taxation and Developing Countries

Zucman (QJE 2013) *The Missing Wealth of Nations: Are Europe and the US Net Debtors or Net Creditors?*

Zucman (2013): Overview

- ▶ At the global level, liabilities > assets. The world is a net debtor!
- ▶ Capital seems to be moving away from the rich world, EU and US net debtors. “China owns the world”
- ▶ Zucman: This is a statistical illusion. Accounting for offshore wealth properly → EU and US are net creditors.

Zucman (2013): Overview



Zucman (2013): Definitions

- ▶ Each country's International Investment Position (IIP) shows its foreign assets and liabilities.

TABLE I
SECURITIES FORM THE BULK OF CROSS-BORDER WEALTH

	Trillions of current US\$	% of world GDP
Securities	40.1	65
Bonds	26.4	43
Equities (including mutual fund shares)	13.7	22
Foreign direct investment	17.7	29
Other (loans, deposits, etc.)	32.0	52
Total cross-border wealth	89.9	146

Notes. World GDP (2008)=US\$61.4 trillion. Values are as of end of 2008. Securities include all “portfolio investments” and the fraction of “reserve assets” invested in equities and bonds. In international investment statistics, all mutual fund shares are classified as equities (irrespective of whether the funds invest in equities or bonds). Derivatives are excluded because they are not measured yet in all leading economies. *Source.* IMF Balance of Payments Statistics and the updated and extended version of the External Wealth of Nations database constructed by Lane and Milesi-Ferretti (2007).

Zucman (2013): Definitions

- ▶ Denote by A_{ij} the amount of securities issued by country j and owned by residents of country i
- ▶ Covered agents: Large banks etc, report directly a_{ij} . Others (households) indirectly \tilde{a}_{ij}
- ▶ Securities are entrusted to a bank somewhere for custody, in country k

$$A_{ij} = \sum_k A_{ij}^k = \sum_k \left(a_{ij}^k + \tilde{a}_{ij}^k \right) =$$
$$\underbrace{\left[a_{ij}^i + \tilde{a}_{ij}^i \right]}_{\text{onshore}} + \underbrace{\sum_{k \neq i} \left(a_{ij}^k + \tilde{a}_{ij}^k \right)}_{\text{offshore}}$$

- ▶ The problem: The \tilde{a}_{ij}^k aren't recorded in i or k
- ▶ The trick: The \tilde{a}_{ij}^k are liabilities in j

Zucman (2013): Swiss Case Study

TABLE II

LARGE PORTFOLIOS OF SECURITIES ARE HELD IN SWISS BANKS BY FOREIGNERS

	Belonging to foreigners	Belonging to Swiss residents
Foreign securities	1,545	810
Bonds	540	484
Equities	1,005	326
(of which: mutual fund shares)	767	196
Fiduciary bank deposits	478	45
Total	2,022	855

Notes. Values are in billions of current U.S. dollars, as of end 2008. *Source.* Securities: Swiss National Bank's *Monthly Statistical Bulletin* (<http://www.snb.ch/en/iabout/stat/statpub/statmon/stats/statmon>), series *D5₁*, *D5_{1a}*, *D5_{1b}*, *D5₂*, and *D5_{2b}*, and *Banks in Switzerland* (<http://www.snb.ch/en/iabout/stat/statpub/bchpub/stats/banken>), series 38a, 38b, 38c. Fiduciary deposits: *Monthly Statistical Bulletin*, series *D4*, *D4_{1a}*, *D4_{2a}*, and *Banks in Switzerland* series 36, 37, 38.

Zucman (2013): Swiss Case Study

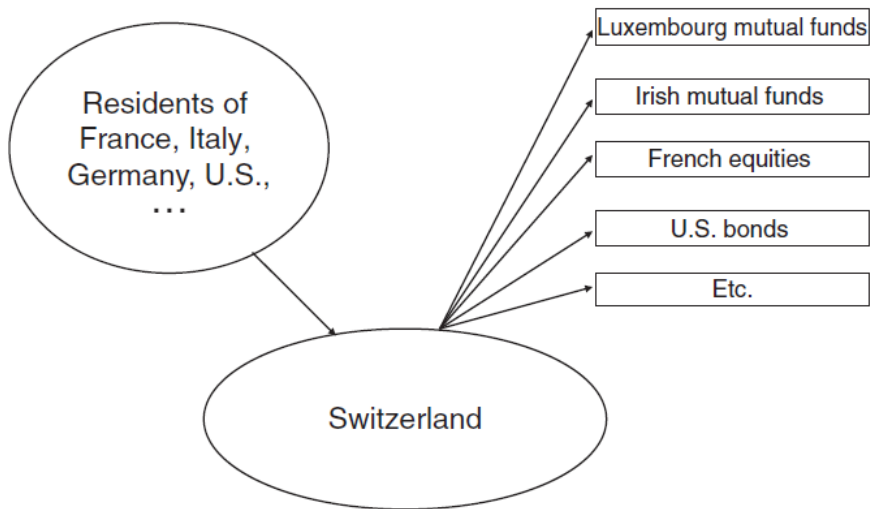


FIGURE II

Through Their Swiss Accounts, Foreigners Mostly Invest in Mutual Funds

Zucman (2013): Swiss Case Study

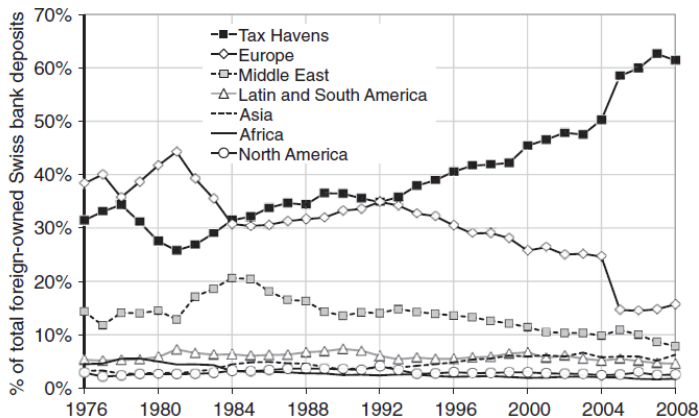


FIGURE III

Most Swiss Accounts Probably Belong to Europeans

This figure shows which countries' residents own Swiss fiduciary bank deposits, as reported by the Swiss National Bank (SNB). The SNB does not see through the sham corporations with addresses in such places as Panama or the British Virgin Islands used by European, U.S., and other rich countries' households as nominal owners of their accounts. This explains the high share of deposits assigned to tax havens. *Source: Online Appendix Table A25.*

Zucman (2013): Estimating Total Offshore Wealth

- ▶ e.g. French hh holds Luxembourg asset through Swiss bank.
 - ▶ no French record
 - ▶ Switzerland records nothing
 - ▶ Luxembourg records liability
- ▶ Generalize: L_j = liabilities of country j A_{ij} true assets i holds on j . \hat{A}_{ij} statistical estimate of A_{ij}

$$\sum_j L_j > \sum_j \sum_i A_{ij}$$

- ▶ As a result, more dividends and interest will be paid than received too.

Zucman (2013): Estimating Total Offshore Wealth

- ▶ This applies in flows too: e.g. a US individual uses Bahamian account to buy a UK equity.
- ▶ \Rightarrow if offshore account holders are net buyers of securities, more securities sold than purchased globally.
- ▶ To measure assets assume:
 1. direct reporters and onshore household assets measured correctly
 2. global portfolio liabilities accurately recorded
- ▶ Then difference between liabilities and assets captures tax haven wealth.

$$\Omega = \sum_i L_i - \sum_i \hat{A}_i$$

Zucman (2013): Results

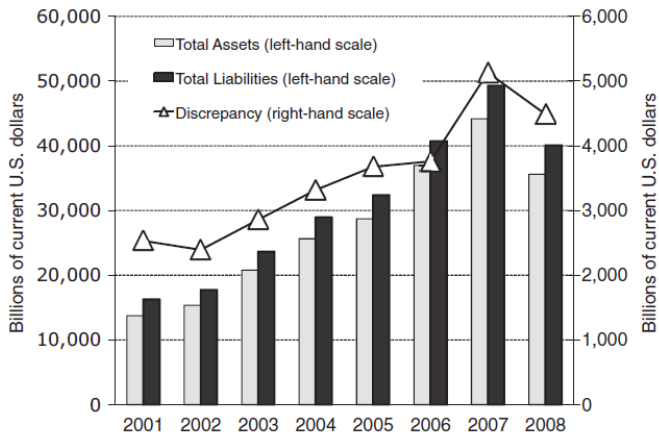


FIGURE IV

Each Year, Less Securities Assets Are Recorded Than Liabilities

This figure charts the securities assets and liabilities identifiable world-wide. Securities include all equities and bonds classified as portfolio investments or reserves. The totals cover 237 countries and territories along with international organizations. *Source:* Online Appendix Table A3.

Zucman (2013): Results

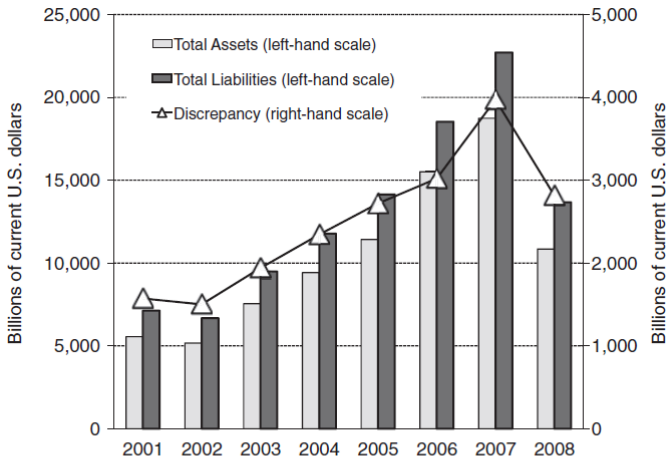


FIGURE V

Each Year, Less Equity Assets Are Recorded Than Liabilities

This figure charts the equity assets and liabilities identifiable worldwide. Equities include all equities classified as portfolio investments or reserves. The totals cover 237 countries and territories along with international organizations. *Source:* Online Appendix Table A3.

Zucman (2013): Results

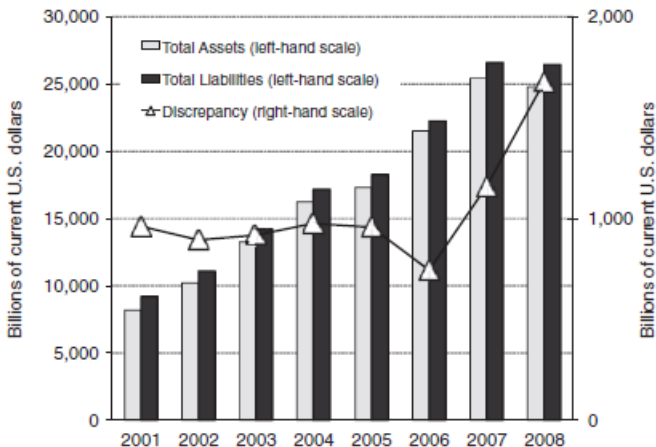


FIGURE VI

Each Year, Less Bond Assets Are Recorded Than Liabilities

This figure charts the bond assets and liabilities identifiable worldwide. Bonds include all debt securities classified as portfolio investments or reserves. The totals cover 237 countries and territories along with international organizations. *Source:* Online Appendix Table A3.

Zucman (2013): Results

TABLE III
ESTIMATED OFFSHORE WEALTH, WORLD AND SWITZERLAND

	World	Switzerland
Offshore securities	4,490	1,545
Bonds	37%	35%
Equities	63%	65%
(Of which: mutual fund shares)	48%	50%
Offshore bank deposits	1,388	478
Total offshore financial wealth	5,878	2,022

Zucman (2013): Results

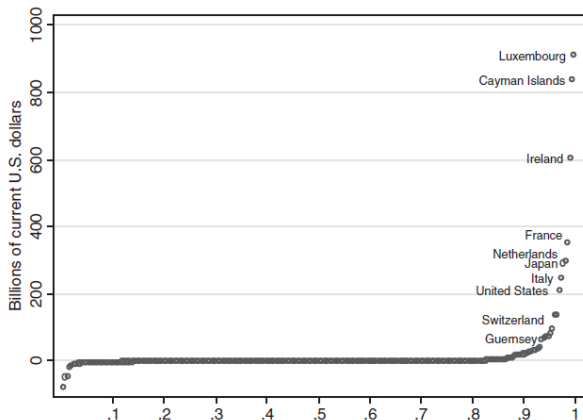


FIGURE VII

Many Mutual Fund Shares Have no Readily Identifiable Owners in the Official Statistics

Each dot represents a country j and is equal to the difference between the securities liabilities reported in 2008 by j (L_j) and the sum of the securities assets on j held by 236 countries i and international organizations ($\sum_i A_{ij}$). The securities issued by Luxembourg, the Cayman Islands, and Ireland are mostly mutual fund shares. *Source:* Online Appendix Tables A13 and A14.

Zucman (2013): Results

TABLE V

ACCOUNTING FOR THE WEALTH IN TAX HAVENS CAN TURN THE EUROZONE INTO A NET CREDITOR

Share (%) of offshore portfolios in Switzerland belonging to eurozone residents	Share (%) of offshore portfolios in havens other than Switzerland belonging to eurozone residents			
	0	25	50	75
0	-11	-6	0	6
40	-6	0	5	11
50	-5	1	7	12
60	-3	2	8	13

Notes. The official eurozone's net foreign asset position/GDP ratio averaged -11% over the 2001-2008 period. If eurozone residents owned 40% of the unrecorded assets held through Switzerland and 50% of those held through the other tax havens, the true net foreign asset position/GDP ratio of the eurozone averaged +5%. *Source.* Online Appendix Table A28.

Zucman (2013): Results

TABLE VI

ACCOUNTING FOR THE WEALTH IN TAX HAVENS IMPROVES THE U.S. NET FOREIGN ASSET POSITION

Share (%) of offshore portfolios in Switzerland belonging to U.S. residents	Share (%) of offshore portfolios in havens other than Switzerland belonging to U.S. residents			
	0	25	50	75
0	-18	-13	-9	-5
5	-17	-13	-8	-4
15	-16	-12	-7	-3

Notes. The official U.S. net foreign asset position/GDP ratio averaged -18% over the 2001-2008 period. If U.S. residents owned 15% of the unrecorded assets held through Switzerland and 25% of those held through the other tax havens, the true net foreign asset position/GDP ratio of the U.S. averaged -12%. *Source.* Online Appendix Table A29.