Econ 230B – Graduate Public Economics

Tax evasion: information, supply, norms

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Roadmap

1. The size of tax evasion
2. Why do people evade?
3. Tax evasion and globalization
4. The supply side of evasion services

1 The size of tax evasion

Most models of optimal taxation assume away enforcement issues. In practice:

- Enforcement is costly for government (administration) and private agents (compliance)
- Substantial tax evasion, eg in countries with high self-employment
- Two widely used surveys: Andreoni, Erard, Feinstein (JEL 1998); Slemrod and Yitzhaki (Handbook of PE, 2002)

Measuring tax evasion with randomized audit studies

Widely used source to study tax evasion: statified random audits

- In the US: IRS conducts thorough audits of stratified sample of tax returns periodically $\rightarrow$ National Research Program (NRP)
- Other countries have similar programs, e.g., Denmark (Kleven et al., Econometrica 2011)
- Important for policy (optimal audit strategy) & economic statistics (estimates of unreported income used in national accounts)

Tax gap in the United States

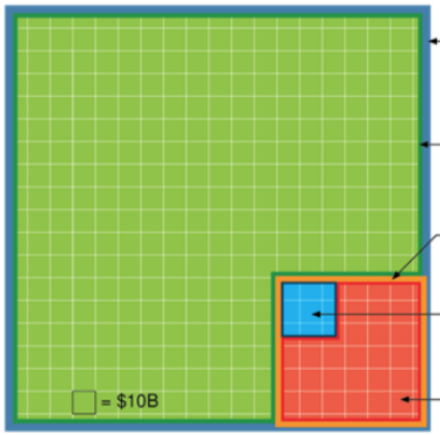
Results from latest NRP studies (IRS 2019) for 2011, 2012, 2013:

- Tax gap (= taxes evaded / taxes owed) around 16% in total
- No clear trend over time
- Tax gap concentrated among income items with no 3rd party reporting (such as self-employment income)
- Withholding reduces tax gap (liquidity constraint $\rightarrow$ some taxpayers can never pay taxes owed unless withheld at source)

Tax Gap Estimates for Tax Years 2011–2013

(Money amounts are in billions of dollars; estimates are annual average amounts.)

IRS Research, Applied Analytics & Statistics



Estimated Total True Tax Liability*
$2,683B

Tax Paid Voluntarily & Timely
$2,242B 83.6% Voluntary Compliance Rate (VCR)

Gross Tax Gap
$441B

Enforced & Other Late Payments
$60B

Net Tax Gap (Tax Not Collected)
$381B 85.8% Net Compliance Rate (NCR)

Calculating the Net Tax Gap

Nonfiling
Underreporting
+ Underpayment
Gross Tax Gap
– Enforced & Other Late Payments
Net Tax Gap

Total True Tax Liability	Tax Paid Voluntarily & Timely	Gross Tax Gap: Nonfiling	Underreporting	Under-payment	Gross Tax Gap	Enforced & Other Late Payments	Net Tax Gap (Tax Not Collected)
$2,683	$2,242	$39	+ $352	+ $50	= $441	– $60	= $381
By Type of Tax							
Individual Income Tax	Individual Income Tax	Individual Income Tax	Individual Income Tax	Individual Income Tax	Individual Income Tax	Individual Income Tax	Individual Income Tax
$1,398	$1,084	$31	+ $245	+ $38	= $314	– $43 (14%)	= $271
			Business Income $110; Non-Business Income $57; Credits $42; Income Offsets [1] $20; Filing Status $5; Other Taxes [2] $1; Unallocated Marginal Effects [3] $10				
Corporation Income Tax	Corporation Income Tax	Corporation Income Tax	Corporation Income Tax	Corporation Income Tax	Corporation Income Tax	Corporation Income Tax	Corporation Income Tax
$294	$251	#	+ $37	+ $5	= $42	– $10 (24%)	= $32
			Large Corpo-rations $26; Small Corpo-rations $11				
Employment Tax	Employment Tax	Employment Tax [4]	Employment Tax	Employment Tax	Employment Tax	Employment Tax	Employment Tax
$920	$839	$6	+ $69	+ $6	= $81	– $5 (6%)	= $77
			Self-Employ-ment Tax $45; FICA & Uncollected FICA TAX $24; Unem-ployment $1				
Estate Tax	Estate Tax	Estate Tax	Estate Tax	Estate Tax	Estate Tax	Estate Tax	Estate Tax
$16	$13	$2	+ $1	+ $<0.5	= $3	– $2 (55%)	= $1

NOTES:

* Totals include Excise Tax.

#—No estimate.

Detail may not add to totals due to rounding.

[1] Includes adjustments, deductions, and exemptions.

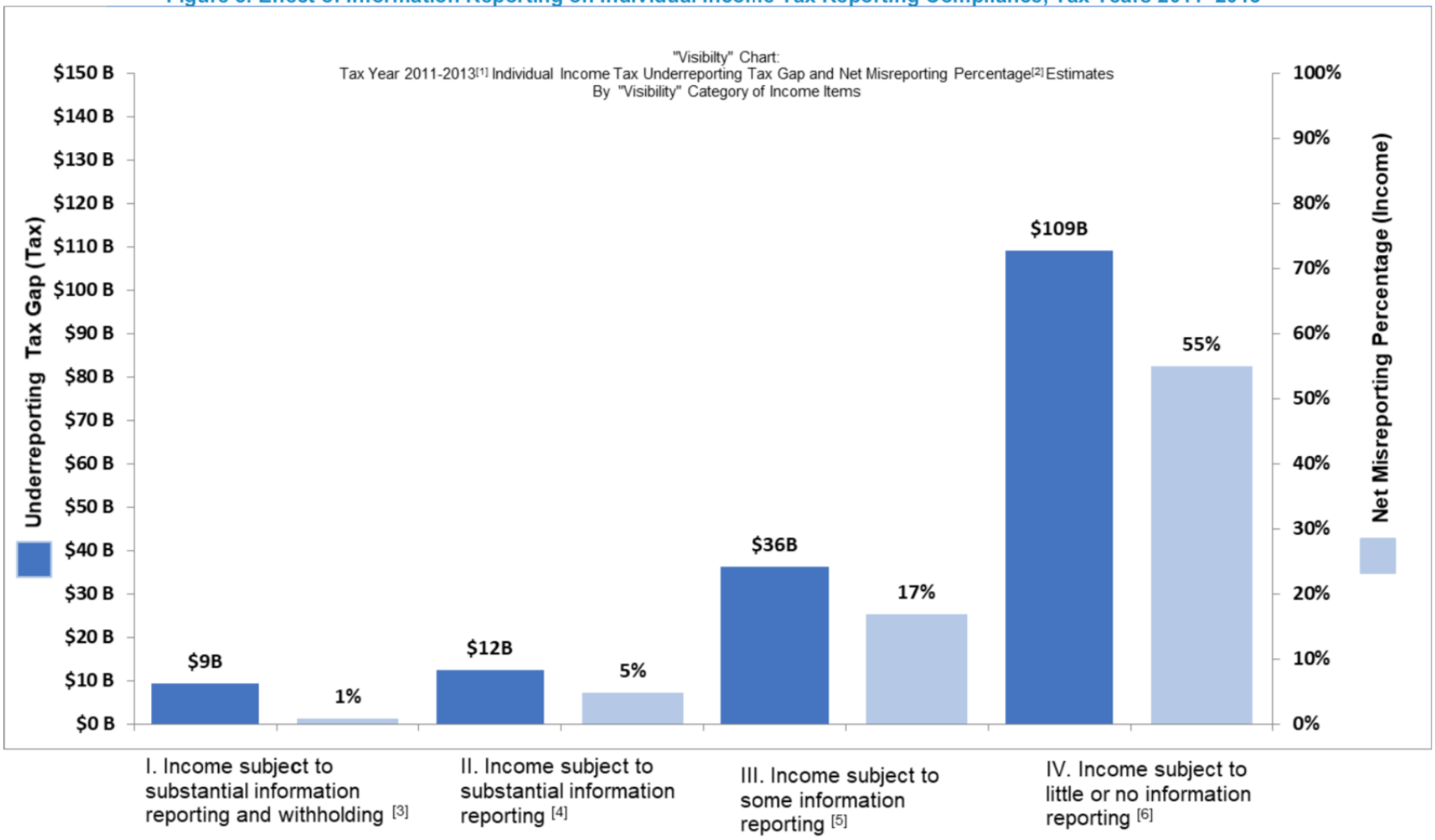
[2] Includes the Alternative Minimum Tax and taxes reported in the "Other Taxes" section of the Form 1040 except for self-employment tax and unreported social security and Medicare tax (which are included in the employment tax gap estimates).

[3] Is the difference between (1) the estimate of the individual income tax underreporting tax gap where underreported tax is calculated based on all misreporting combined and (2) the estimate of the individual income tax underreporting tax gap based on the sum of the tax gaps associated with each line item where the line item tax gap is calculated based on the misreporting of that item only. There may be differences if the marginal tax rates are different in these two situations.

[4] Self-employment tax only.

Revised 09/2019

Figure 3. Effect of Information Reporting on Individual Income Tax Reporting Compliance, Tax Years 2011–2013



[1] The TY 2011--2013 estimate is the annual average for the TY 2011, 2012, and 2013 timeframe. This chart displays the tax gap attributable to the underreported income category and the rate at which that income is misreported as measured by the Net Misreporting Percentage.
[2] The Net Misreporting Percentage is the ratio of the net misreported amount to the sum of the absolute values of the amounts that should have been reported, expressed as a percentage. For categories I - IV, the net misreported amount is understatements of income less overstatements of income. On net, income is understated for these categories.
[3] Includes wages & salaries.
[4] Includes pensions & annuities, unemployment compensation, dividend income, interest income, taxable Social Security benefits.
[5] Includes partnership/S corp. income, capital gains, alimony income.
[6] Includes nonfarm proprietor income, other income, rents and royalties, farm income, Form 4797 income.

Detection controlled estimation (DCE)

How is the gap tax estimated?

- If all evasion is detected in random audits, then income unreported Y_{1i} could be studied using following Tobit model:

$$Y_{1i} = \begin{cases} Y_{1i}^* & \text{if } Y_{1i}^* > 0 \\ 0 & \text{if } Y_{1i}^* \leqslant 0 \end{cases}$$

- Where $Y_{1i}^* = X_{1i}\beta_1 + \epsilon_{1i}$ latent var measuring propensity to evade

- Problem: only fraction of evasion is detected (auditors miss some)

To estimate undetected evasion, IRS uses DCE model (Feinstein '91)

- Consider Y_{2i} the extent of detection on return i (cond. on $Y_{1i} > 0$)

$$Y_{2i} = \begin{cases} 1 & \text{if } Y_{2i}^* \geqslant 1 \quad \text{(complete detection)} \\ 0 & \text{if } Y_{2i}^* \leqslant 0 \quad \text{(no detection)} \\ Y_{2i}^* & \text{if } 0 < Y_{2i}^* < 1 \quad \text{(detection of fraction } Y_{2i}^* \text{ of evasion)} \end{cases}$$

- Where $Y_{2i}^* = X_{2i}\beta_2 + \epsilon_{2i}$ is latent variable measuring fraction of evasion detected (cond. on evasion happening)

- X_{2i}: examiner's experience, complexity of the return, etc.

Feinstein (1991) estimates this model using ML and finds a lot of evasion goes undetected in IRS random audit studies:

- Intuition: some examiners find more evasion $\rightarrow$ if all examiners were like them, total evasion would be 3 $\times$ detected evasion
- But results very sensitive to parametric assumptions (correlation between ϵ_{1i} and ϵ_{2i}) [examiners not randomly assigned]
- Absolute detection rates are not identified (can't know whether the best examiner captures 100% or less than evasion)

Based on DCE, IRS $\times$ detected evasion by 3.

2 Why do people evade taxes?

Seminal model: Allingham and Sandmo (JpubE 1972)

- Individual taxpayer problem:

$$\max_{\bar{w}} \ (1-p) \cdot u(w - \tau \cdot \bar{w}) + p \cdot u(w - \tau \cdot \bar{w} - \tau(w - \bar{w})(1+\theta))$$

- where w is true income, $\bar{w}$ reported income, τ tax rate, p probability to be caught evading, θ fine factor, $u(.)$ concave

- Let $c^{uncaught} = w - \tau \cdot \bar{w}$
- Similarly, $c^{caught} = w - \tau \cdot \bar{w} - \tau(w - \bar{w})(1 + \theta)$
- FOC in $\bar{w}$: $-\tau(1-p)u'(c^{uncaught}) + p\theta\tau u'(c^{caught}) = 0$

$$\frac{u'(c^{caught})}{u'(c^{uncaught})} = \frac{1-p}{p\theta}$$

- SOC: $\tau^2(1-p)u''(c^{uncaught}) + p\tau^2\theta^2 u''(c^{caught}) < 0$
- Key result: evasion $w - \bar{w} \downarrow$ with p and θ (Yitzhaki, 1987).

- Proof of $d\bar{w}/dp > 0$: Differentiate FOC with respect to p and $\bar{w}$

$$-dp \cdot \tau u'(c^{uncaught}) - d\bar{w} \cdot \tau^2(1-p)u''(c^{uncaught}) = dp \cdot \theta\tau u'(c^{caught}) + d\bar{w} \cdot p\theta^2\tau^2 u''(c^{caught})$$

$$\Rightarrow d\bar{w} \cdot [-\tau^2(1-p)u''(c^{uncaught}) - p\theta^2\tau^2 u''(c^{caught})] = dp \cdot [\theta\tau u'(c^{caught}) + \tau u'(c^{uncaught})]$$

- Similar proof for $d\bar{w}/d\theta > 0$

- No effect of marginal tax rate on evasion if linear penalty, linear taxation & risk-neutrality. In more general model, substitution effect of the marginal tax rate on evasion is ambiguous

Why is tax evasion so low in OECD countries?

Puzzle: US has low audit rates ($p = .01$) and fines ($\theta \simeq .2$). With reasonable risk aversion (say CRRA $\gamma = 1$), tax evasion should be much higher than observed.

Two types of explanations:

- Unwilling to cheat: Social norms and morality [people dislike being dishonest] (Luttmer and Singhal, 2014)
- Unable to cheat: Probability of being caught is much higher than observed audit rate because of 3rd party reporting

Determinants of tax evasion

Large literature studies tax evasion levels and effect of tax rates, penalties, audit proba, prior audit experiences, socio-economic charac.

Early literature relies on observational [non-experimental] data which creates identification and measurement issues:

- Evasion is difficult to measure
- Most independent variables [audits, penalties, etc.] are endogenous responses to evasion and also difficult to measure

$\rightarrow$ Recent literature uses random audits and/or field experiments

Kleven et al. (Ecometrica 2011)

- Large stratified random sample (40,000 taxpayers audited)
- Very low rates of detected evasion: macro tax gap about 2.5%
- But evasion rate for self-reported items is almost 40%, evasion rate for third party reported items is only 0.3%
- Tot evasion very low because 95% of income is 3rd-party-reported
- Information trumps social & economic factors:
  $Evade_i = \alpha + \beta Self\,Reported\,Income_i + \gamma Social\,Factors_i + \varepsilon_i$

Determinants of the Probability of Audit Adjustment: Social, Economic, and Information Factors

	Social factors		Socio-economic factors		Information factors		All factors	
Constant	**14.42**	(0.64)	**11.92**	(0.66)	**1.44**	(0.25)	**3.98**	(0.62)
Female	**-5.76**	(0.43)	**-4.45**	(0.45)			**-2.05**	(0.41)
Married	**1.55**	(0.46)	-0.36	(0.48)			**-1.64**	(0.44)
Member of church	**-1.98**	(0.59)	**-2.67**	(0.58)			**-1.19**	(0.54)
Copenhagen	-0.29	(0.67)	1.20	(0.67)			1.00	(0.62)
Age above 45	-0.37	(0.45)	-0.35	(0.45)			0.10	(0.42)
Home owner			**5.96**	(0.48)			-0.35	(0.46)
Firm size below 10			**4.43**	(0.82)			**2.97**	(0.76)
Informal sector			**3.25**	(0.86)			-0.99	(0.79)
Self-Reported Income					**9.47**	(0.53)	**9.72**	(0.54)
Self-Reported Income > 20K					**17.46**	(0.91)	**17.08**	(0.92)
Self-Reported < -10K					**14.63**	(0.72)	**14.53**	(0.72)
Audit Flag					**15.48**	(0.59)	**15.32**	(0.60)
R-square	**1.1%**		**2.1%**		**17.1%**		**17.4%**	
Adjusted R-square	**1.0%**		**2.1%**		**17.1%**		**17.4%**	

Source: Kleven et al. (2010)

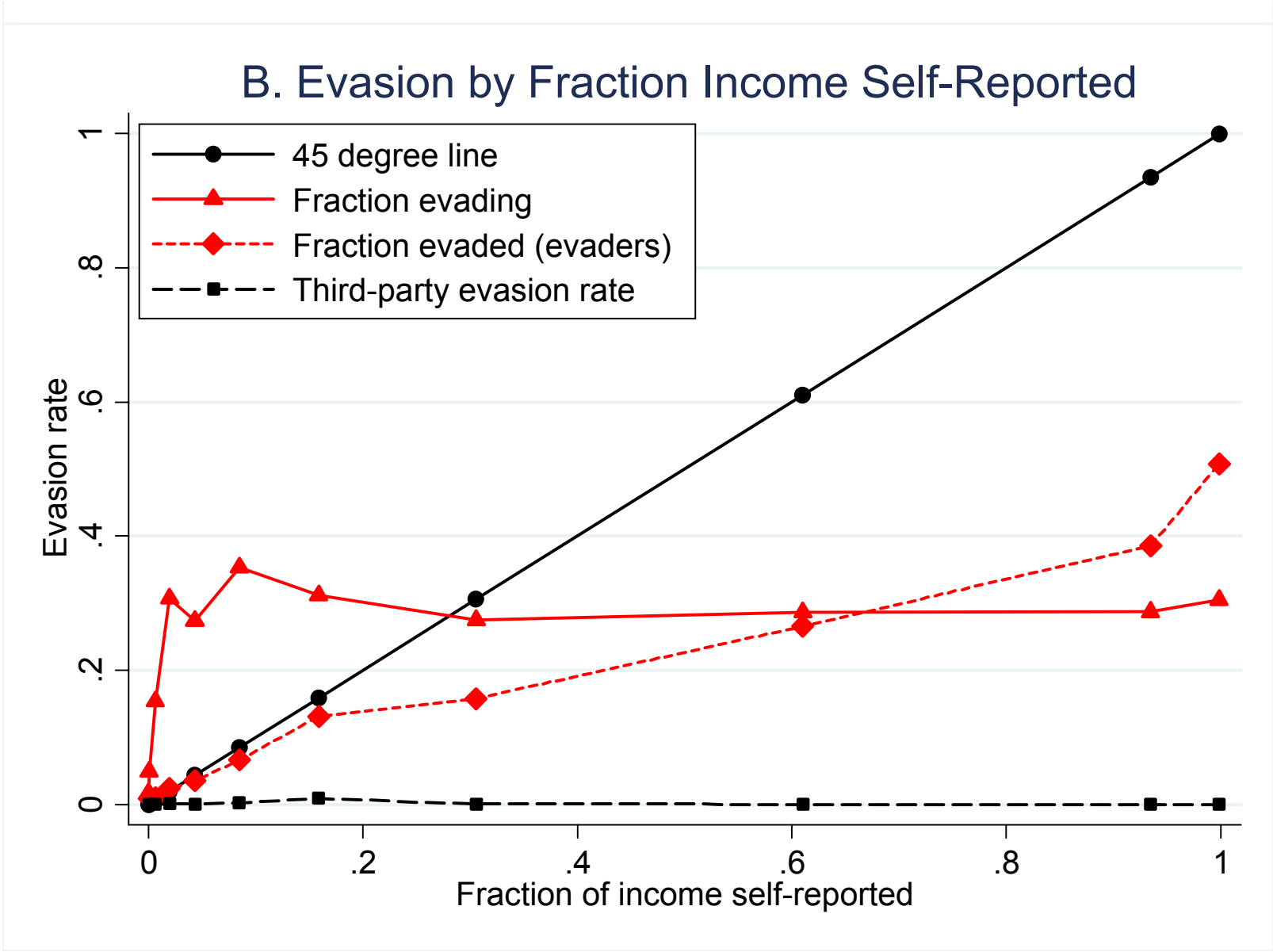
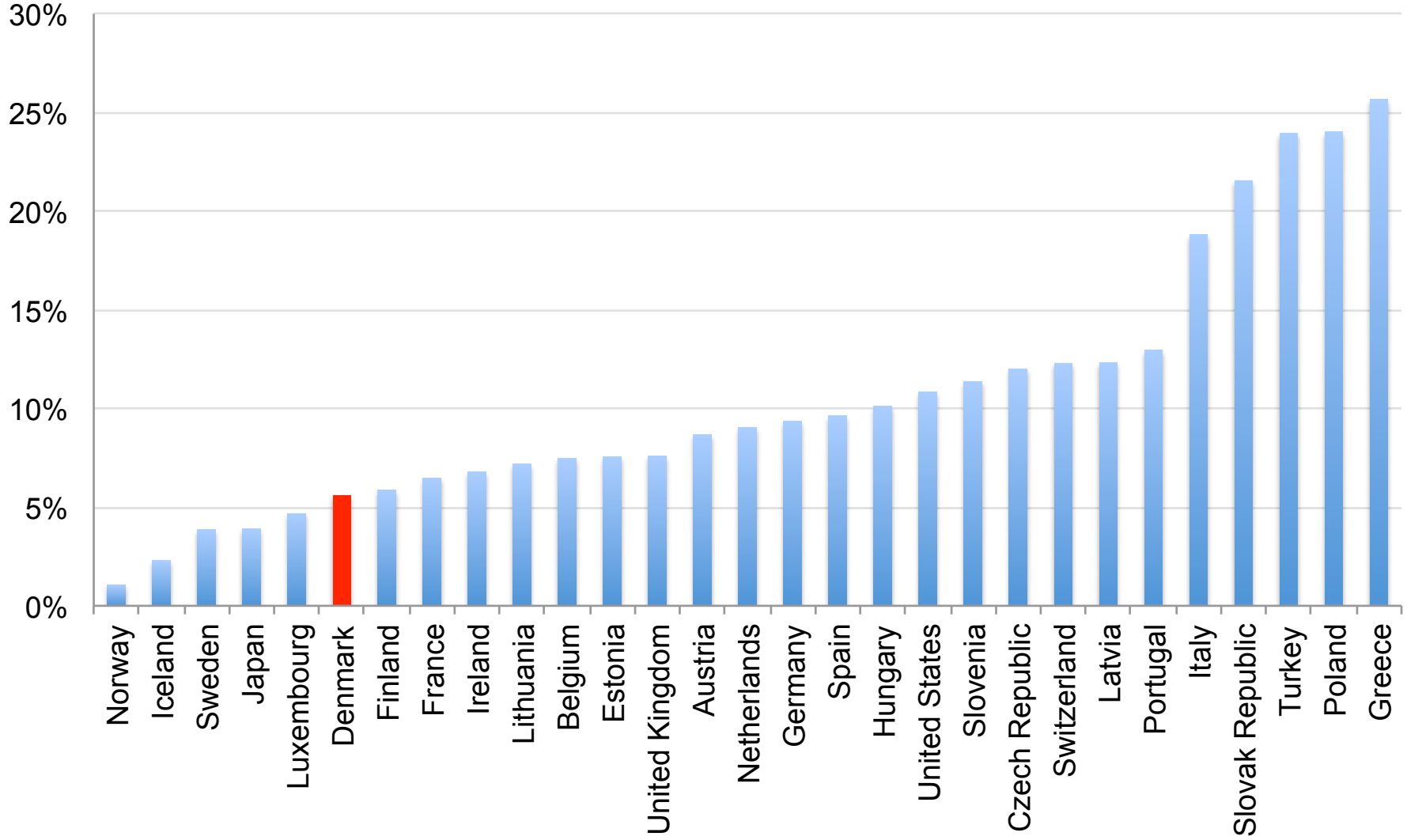


Figure 3. Anatomy of Tax Evasion[18]

Panel A displays the density of the ratio of evaded income to self-reported income (after au

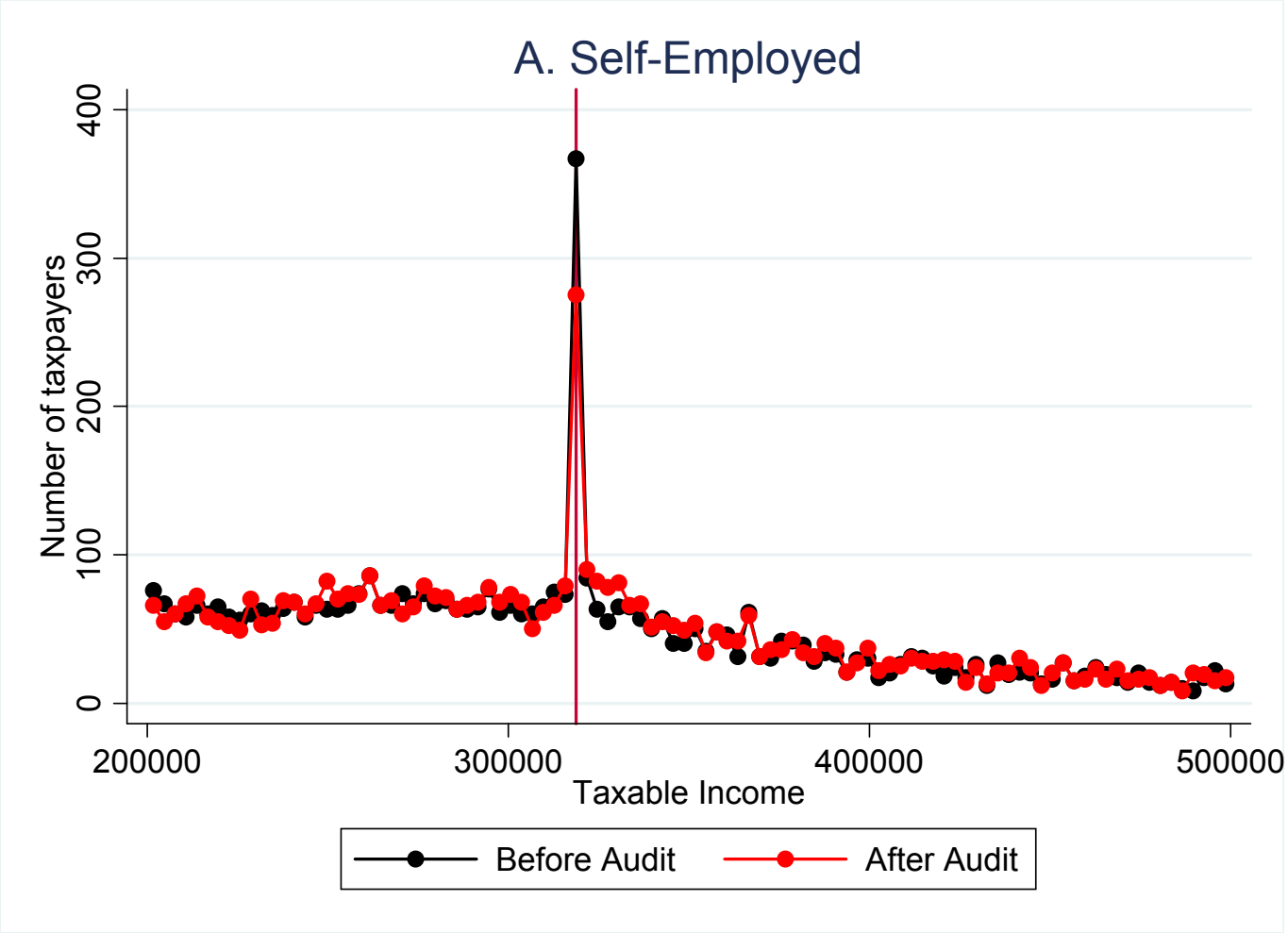
The share of self-employment income in GDP in OECD countries
(Gross mixed income as a % of factor-cost GDP)



The effect of marginal tax rates on evasion

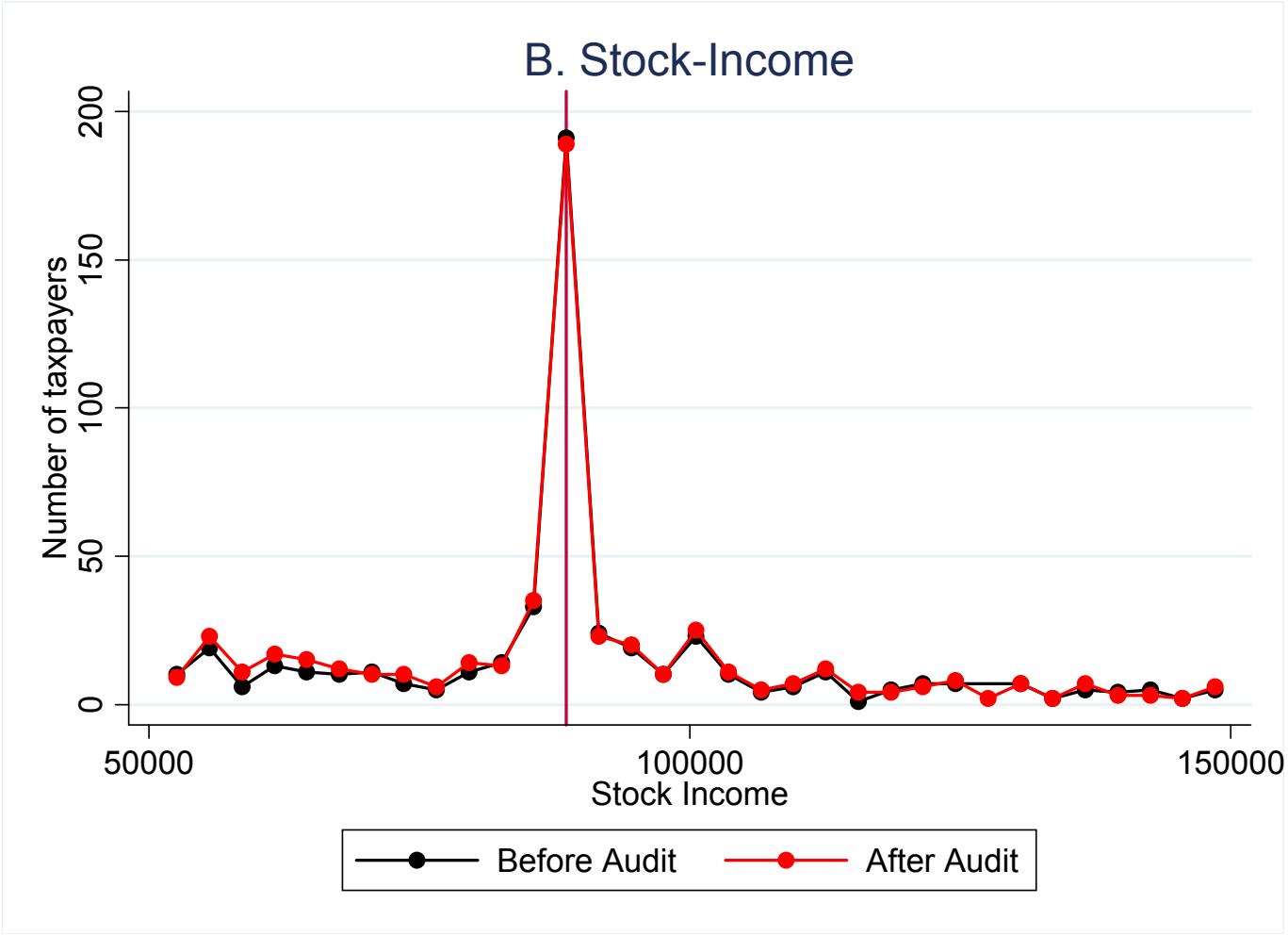
- Kleven et al. (2011) also provide quasi-experimental causal effects of marginal tax rates on evasion
- Use bunching evidence before and after audit
- Find most bunching not due to evasion but avoidance $\rightarrow$ effect of MTR on evasion is modest
- Information reporting is much more important than low marginal tax rates to achieve enforcement

Bunching at the Top Kink in the Income Tax



Source: Kleven et al. (2010)

Bunching at the Kink in the Stock Income Tax



Source: Kleven et al. (2010)

3 Tax evasion and globalization

Globalization has opened new forms of evasion: hiding assets abroad

- Offshore wealth $\approx 8\%$ of world's household financial wealth (Zucman QJE 2013)

- Hard to study with random audits

  Small number of rich individuals sampled

  Hard to detect complex evasion involving foreign intermediaries

$\rightarrow$ Random audits need to be supplemented with other sources

Data to capture offshore evasion

- Tax amnesties (eg, offshore voluntary disclosure program in the US: Johannesen et al. 2018)

- Leaks from providers of tax evasion services: Panama Papers, Swiss leaks, offshore leaks, etc. (Alstadsæter et al. AER 2019)

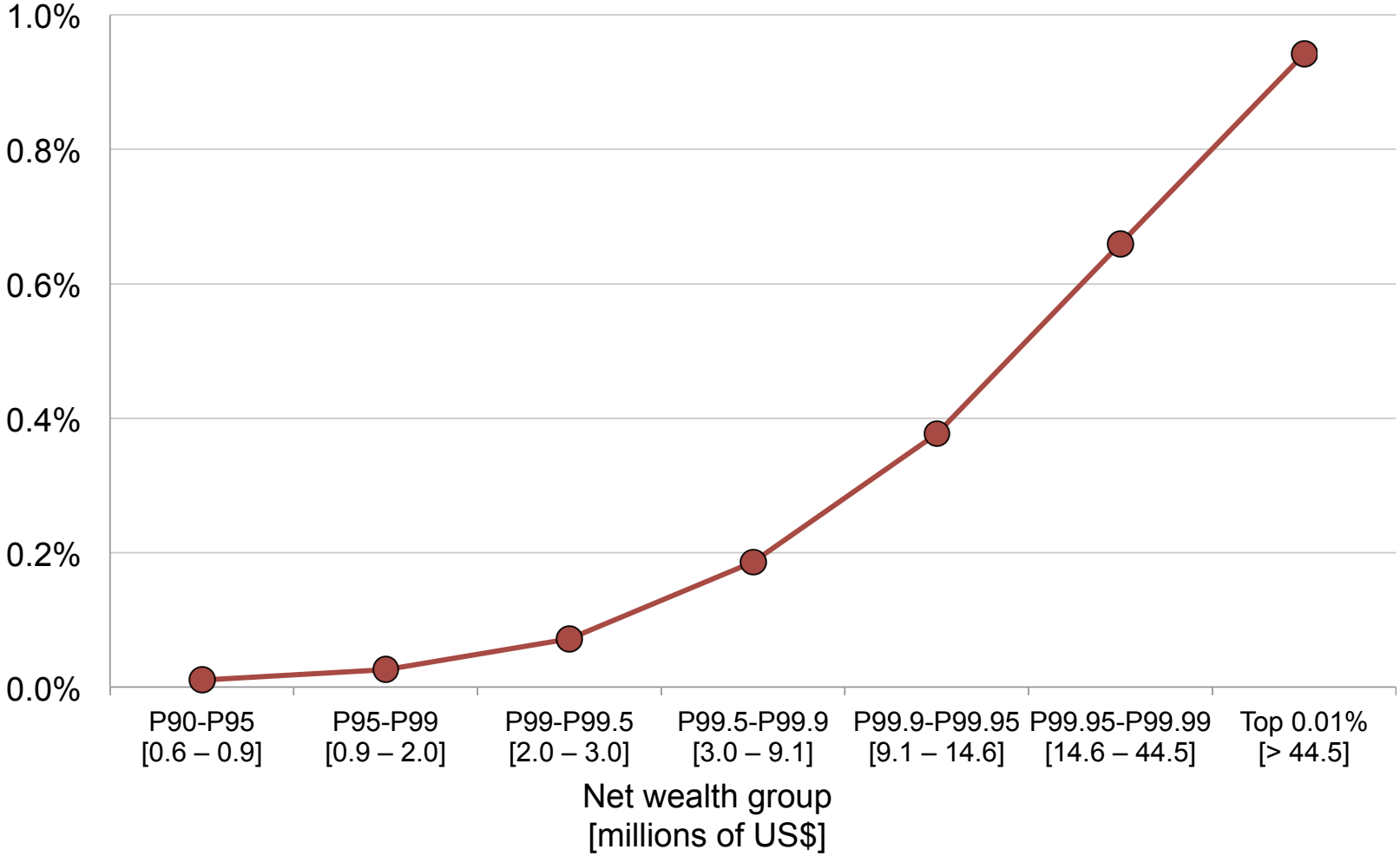
- Macro statistics on wealth held in tax havens (tax haven central banks, BIS; eg, Johannesen-Zucman AEJ 2014)

Alstadsæter et al. (AER 2019)

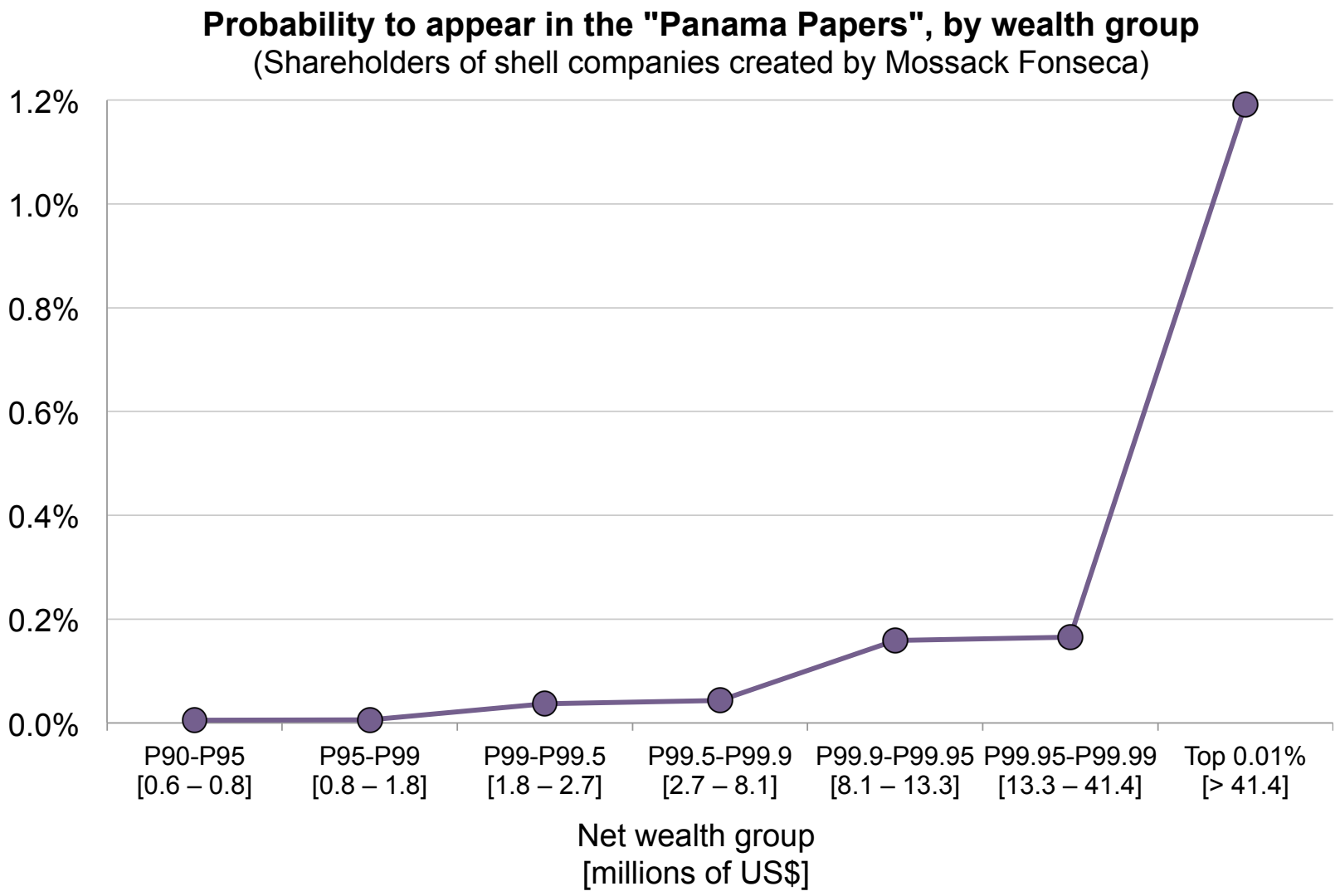
- Complete file of the clients of HSBC Switzerland was leaked in 2007 and obtained by tax authorities
- HSBC: large bank ($\approx$ 5% of Swiss offshore wealth)
- Accounts frequently held through shell companies, but HSBC recorded identity of beneficial owners
- Clear-cut way to identify evasion by linking to tax returns of clients $\rightarrow$ linking done in Scandinavia
- Similar exercise done for Panama Papers leak and tax amnesty

Probability to own an unreported HSBC account, by wealth group

(HSBC leak)

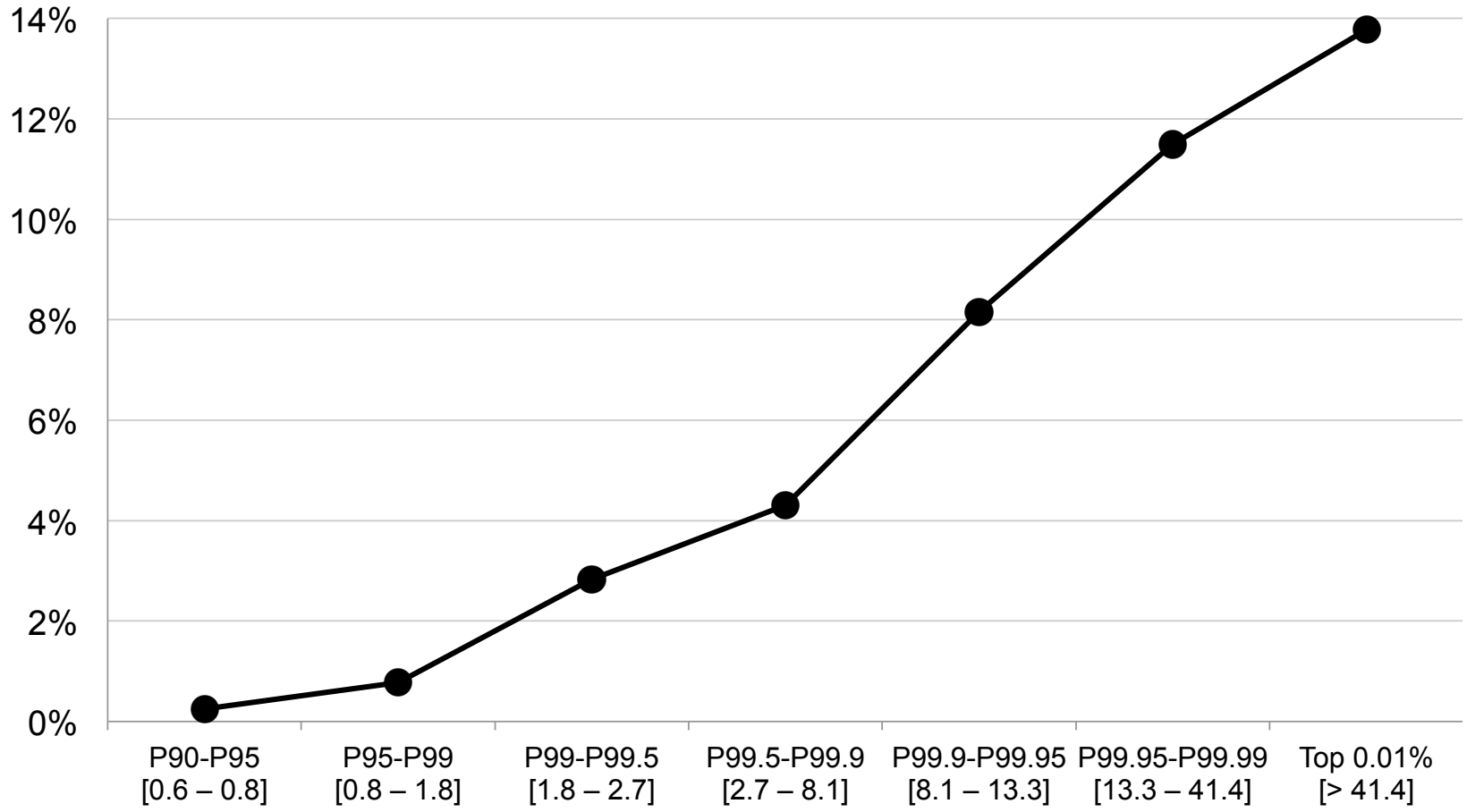


Source: Alstadsæter (2019)

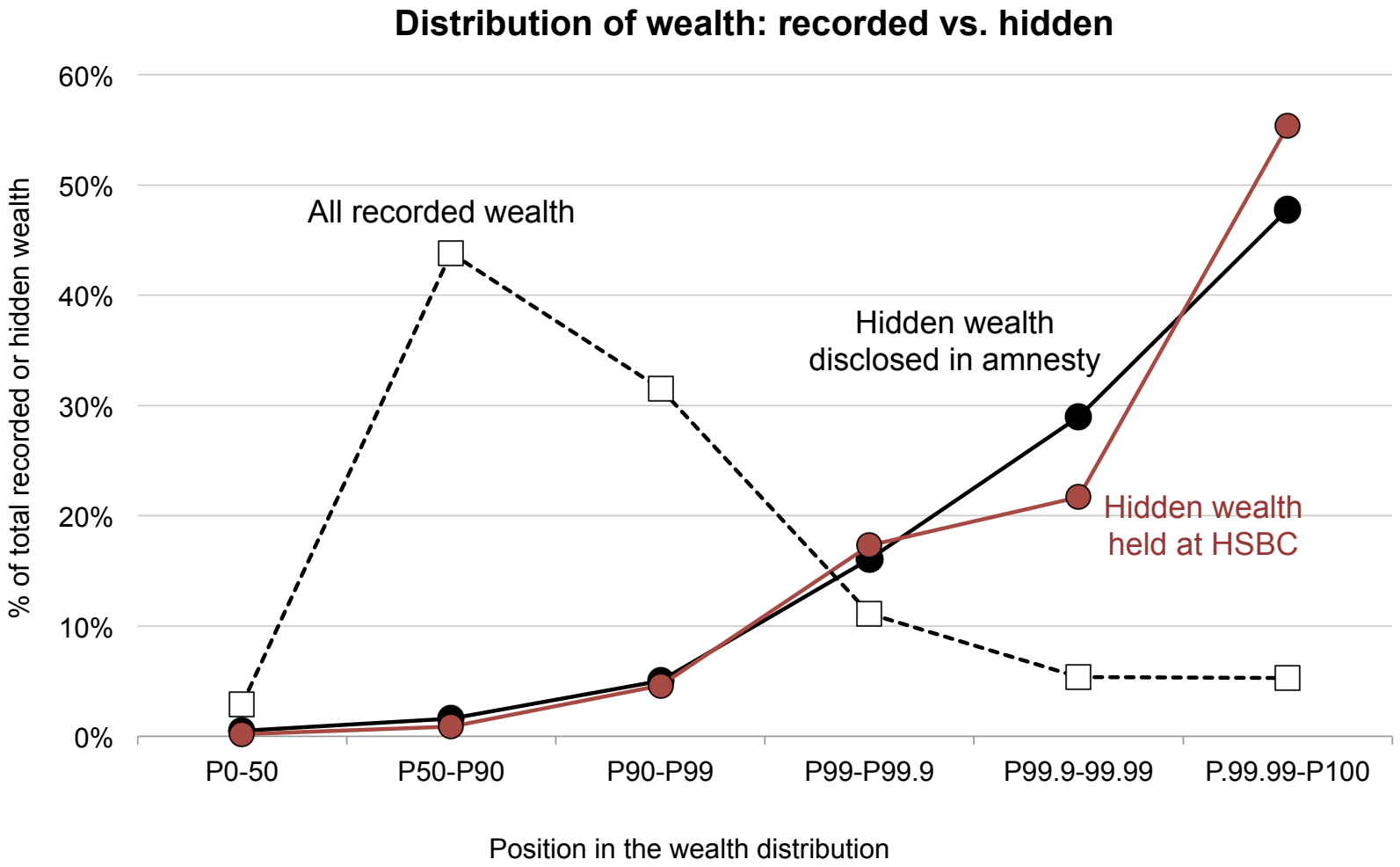


Source: Alstadsæter (2019)

Probability to voluntarily disclose hidden wealth, by wealth group
(Swedish and Norwegian tax amnesties)



Source: Alstadsæter (2019)

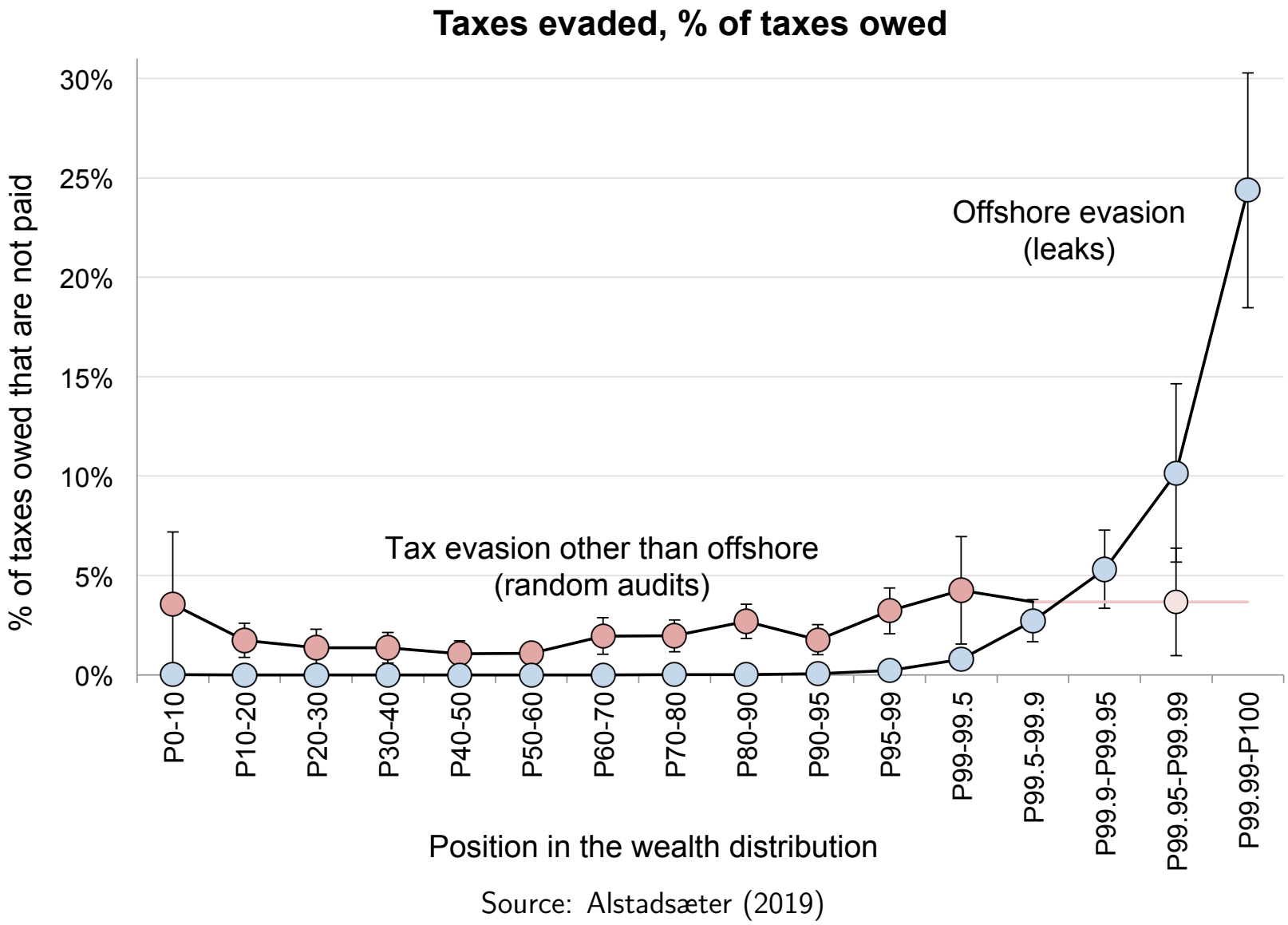


Source: Alstadsæter (2019)

Distributional Tax Gaps

Idea: combine random audits and leaks to allocate total tax evasion across the income distribution.

- Make assumptions on stock of offshore wealth (based on macroeconomic statistics)
- Assume that offshore wealth distributed like in HSBC and amnesties
- Apply rate of return on offshore wealth and use tax simulator to estimate evaded tax



Source: Alstadsæter (2019)

4 The supply of evasion services

Why high evasion rates at the top? Hard to understand in AS model (= demand side). Alstadsæter et al. (2019): model of supply side

- Population of mass one with wealth density $f(y)$
- Monopolistic bank sells tax evasion services (historically, Swiss banks have operated as a cartel), charges θ per \$ of wealth hidden
- Infinitely elastic demand at price θ: bank optimizes on # of clients
- Manages $k(s)$ in wealth when serves $s = 1 - F(y)$ and earns $\theta k(s)$ in revenue

Bank has probability λs to be caught $\rightarrow$ fine $\phi k(s)$

Risk-neutral bank maximizes profits

$$\pi(s) = \theta k(s) - \lambda s \phi k(s)$$

At interior optimum:

$$\theta = \left(\frac{1}{\epsilon_k(s)} + 1 \right) \phi \lambda s$$

- Where $\epsilon_k(s) = sk'(s)/k(s)$ is elasticity of the amount of hidden wealth managed with respect to s

If wealth Pareto-distributed, supply of evasion services is:

$$s = \frac{\theta}{(1+b)\,\lambda\phi}$$

- b is the inverted Pareto-Lorenz coefficient (high $b \rightarrow$ high inequality)

Higher λ or higher $\phi \rightarrow$ fewer & richer clients

If high inequality, bank will serve tiny fraction of the pop.

Policies to curb tax evasion

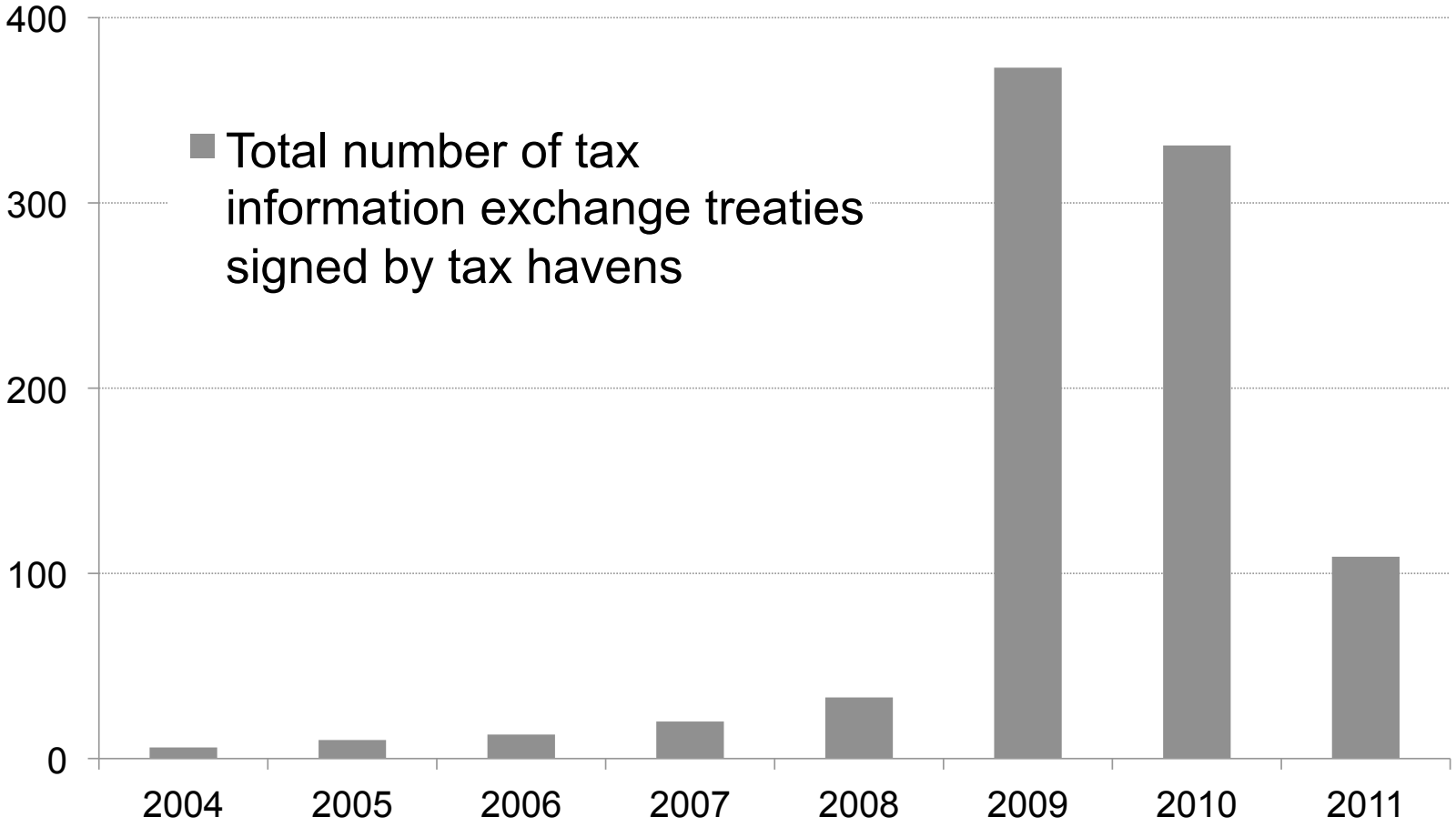
- High fines for suppliers (ϕ): shrinks the supply of evasion services
- More practical than high fines for evaders, but "too big to indict" problem
- Tax evasion: increasingly a financial regulation problem?
- Increase detection probability λ: third-party reporting. But can be difficult to enforce internationally

International information sharing

- Without third-party reporting on these assets, very easy to evade residence-based taxes (on personal capital income and wealth)
- Traditionally, tax havens exchanged no/very little information
- This is changing: FATCA and similar laws in other OECD countries
- More complciated compared to domestic information sharing: incomplete cooperation & incentives of tax havens

Pitfalls of incomplete coop. (Johannesen & Zucman '14)

- April 2009: G20 countries force tax havens to sign bilateral information exchange treaties
- But to be compliant a tax haven needs to sign only 12 treaties
- Bilateral data from Bank for International Settlements show bank deposits shifted to havens with no treaty
- Highlights importance to have global cooperation


400
300
200
100
0
Total number of tax information exchange treaties signed by tax havens
2004
2005
2006
2007
2008
2009
2010
2011

Research design: panel regressions with country-pair fixed effects

$$log(Deposits_{ijq}) = \alpha + \beta Treaty_{ijq} + \gamma_{ij} + \theta_q + \epsilon_{ijq}$$

- i: source country (e.g., France)
- j: host country (e.g., Switzerland)
- Quarterly observations 2004-2011
- Time and country-pair fixed effects

Dependent variable: deposits of savers of country *i* in banks of country *j*		
VARIABLES	BANK: havens SAVER: non-havens	BANK: havens SAVER: non-havens
Treaty between *i* and *j*	**-0.1156**** **(0.0349)**	
Treaty (Contemp)		0.0223 (0.6331)
Treaty (+1 quarter)		-0.0927 (0.1300)
Treaty (+2 quarters)		-0.1306** (0.0449)
Treaty (+3 quarters)		-0.1724*** (0.0057)
Treaty (>3 quarters)		-0.1818** (0.0137)
Observations	30,960	30,960
Countrypair FE	YES	YES
Time FE	YES	YES

Robust p-values in parentheses, clustered at the country-pair level

Dependent variable: deposits of savers of country *i* in banks of country *j*

VARIABLES	BANK: havens SAVER: non-havens	BANK: havens SAVER: non-havens
Treaty between *i* and *j*	-0.1659***	-0.0498
	(0.0052)	(0.4286)
Saving tax directive (STD)	-0.2161***	-0.2198***
	(0.0004)	(0.0003)
# of treaties signed by *i* with havens other than *j*	**0.0059****	
	(0.0402)	
# of treaties signed by *i* with havens other than *j* × $Treaty_{ijq}$		0.0001
		(0.9719)
# of treaties signed by *i* with havens other than *j* × (1 - $Treaty_{ijq}$)		0.0120***
		(0.0033)
Observations	30,960	30,960
Countrypair fixed effects	YES	YES
Time fixed effects	YES	YES

Robust p-values in parentheses, clustered at the country-pair level

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