Econ 230B – Graduate Public Economics

Tax evasion

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Roadmap

1. The size of tax evasion
2. Why do people evade?
3. 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, at top of the wealth distribution, and in businesses
- 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)

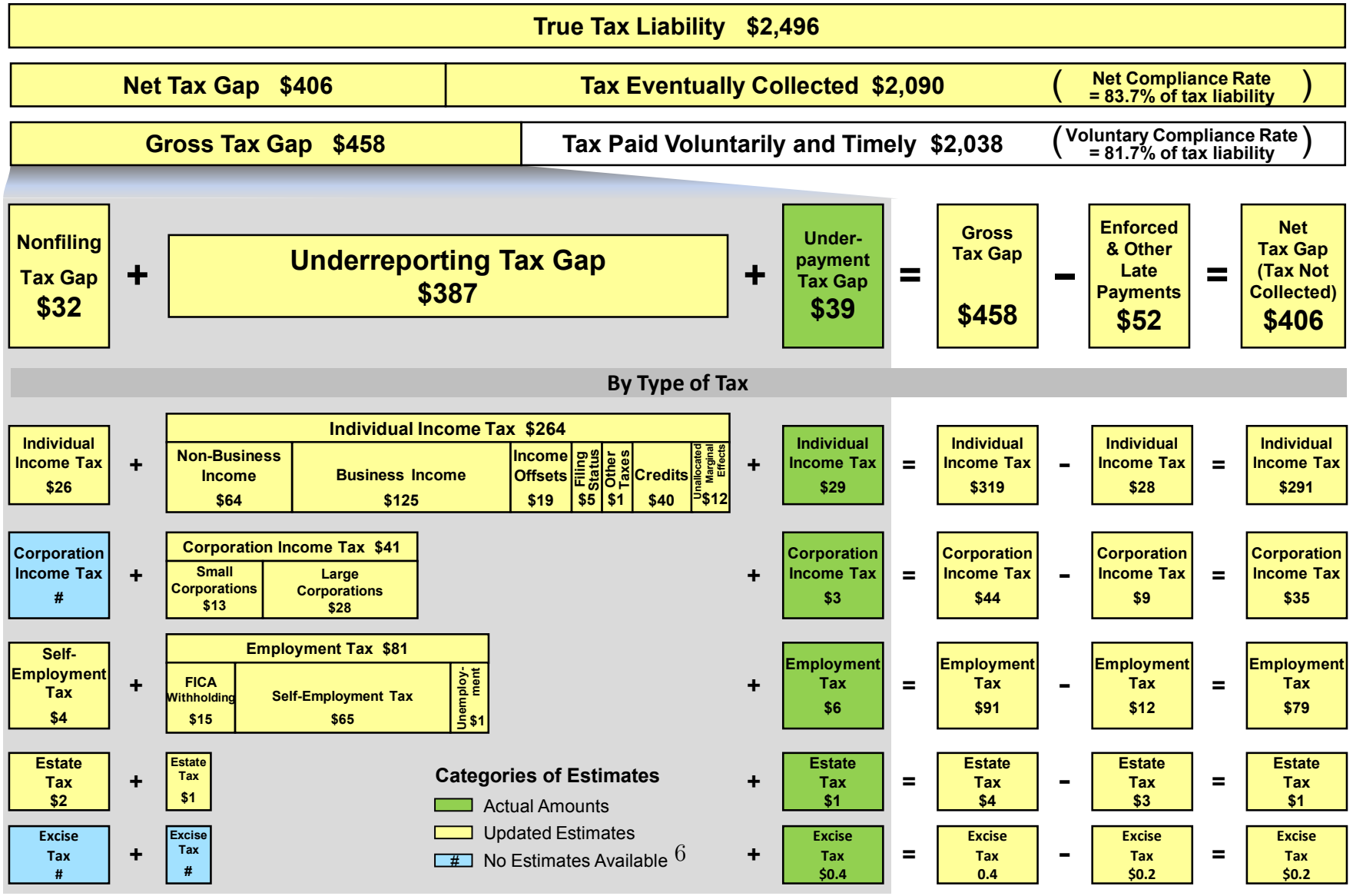
Tax gap in the United States

Results from latest wave of NRP studies for years 2008, 2009, 2010:

- 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 Map

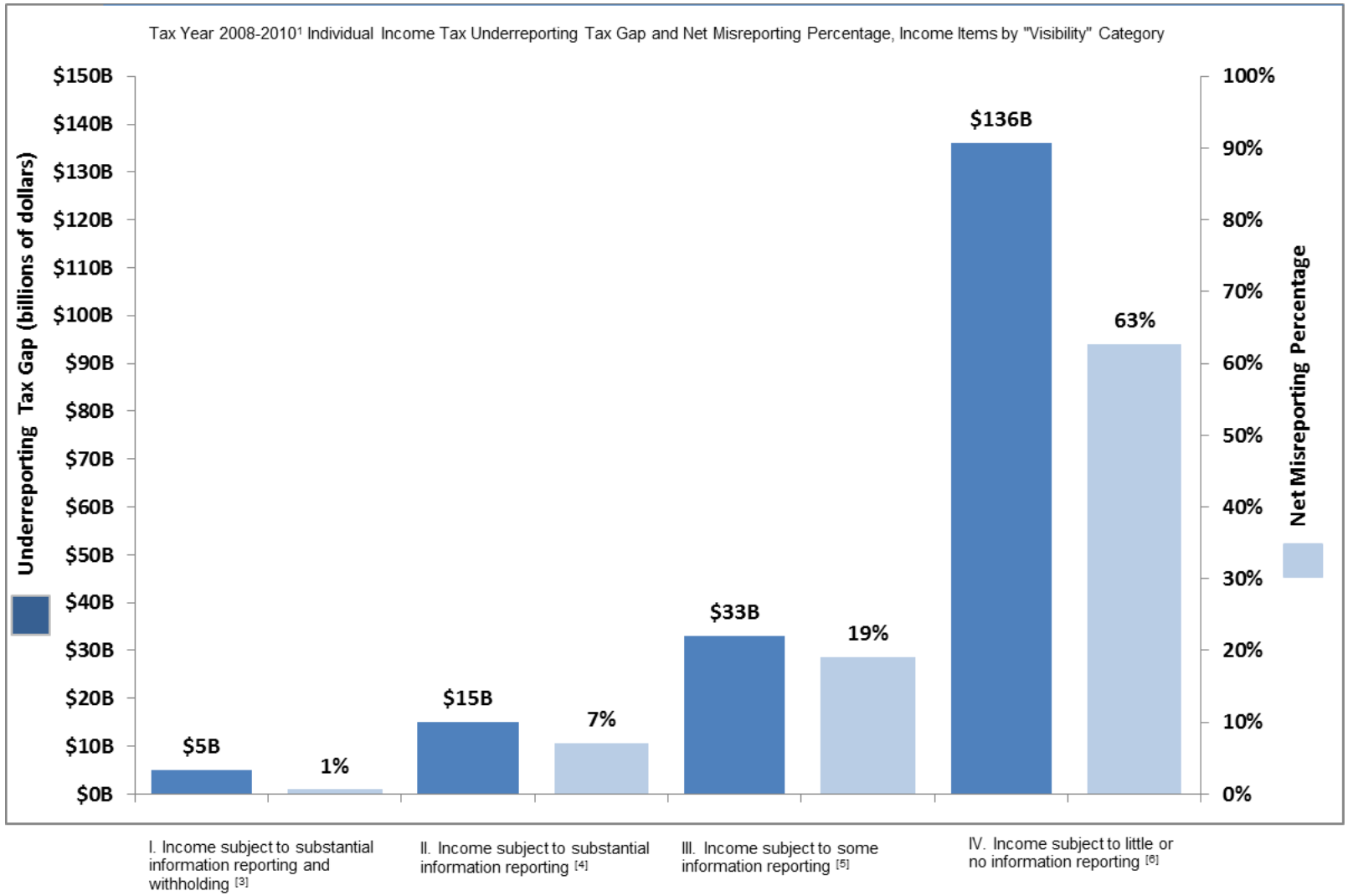
Tax Year 2008-2010 Annual Average ($ Billions)



Internal Revenue Service, April 2016

Detail may not add to total due to rounding . Not to scale.

Figure 1. Effect of Information Reporting on Individual Income Tax Reporting Compliance, Tax Years 2008–2010



[1] The TY 2008 -- 2010 estimate is the annual average for the Tax Year 2008, 2009, and 2010 timeframe.
[2] The Net Misreporting Percentage is the net misreported amount as a ratio of the sum of the absolute values of the amounts that should have been reported expressed as a percentage. For the items included in this chart, the net misreported amount is understatements of income less overstatements of income. On net, income is understated.
[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. Prior definition also included deductions and exemptions.
[6] Includes nonfarm proprietor income, other income, rents and royalties, farm income, Form 4797 income. Prior definition also included adjustments to income.

Internal Revenue Service, April 2016

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. Uncertain.

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 $c^{uncaught} = w - \tau \cdot \bar{w}$
- $c^{caught} = w - \tau \cdot \bar{w} - \tau(w - \bar{w})(1+\theta)$

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

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

- Key result: evasion $w - \bar{w} \downarrow$ with p and θ (Yitzhaki, 1987)

- Proof: differentiate FOC with respect to p, θ and $\bar{w}$

- 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 theoretically 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 serious 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)

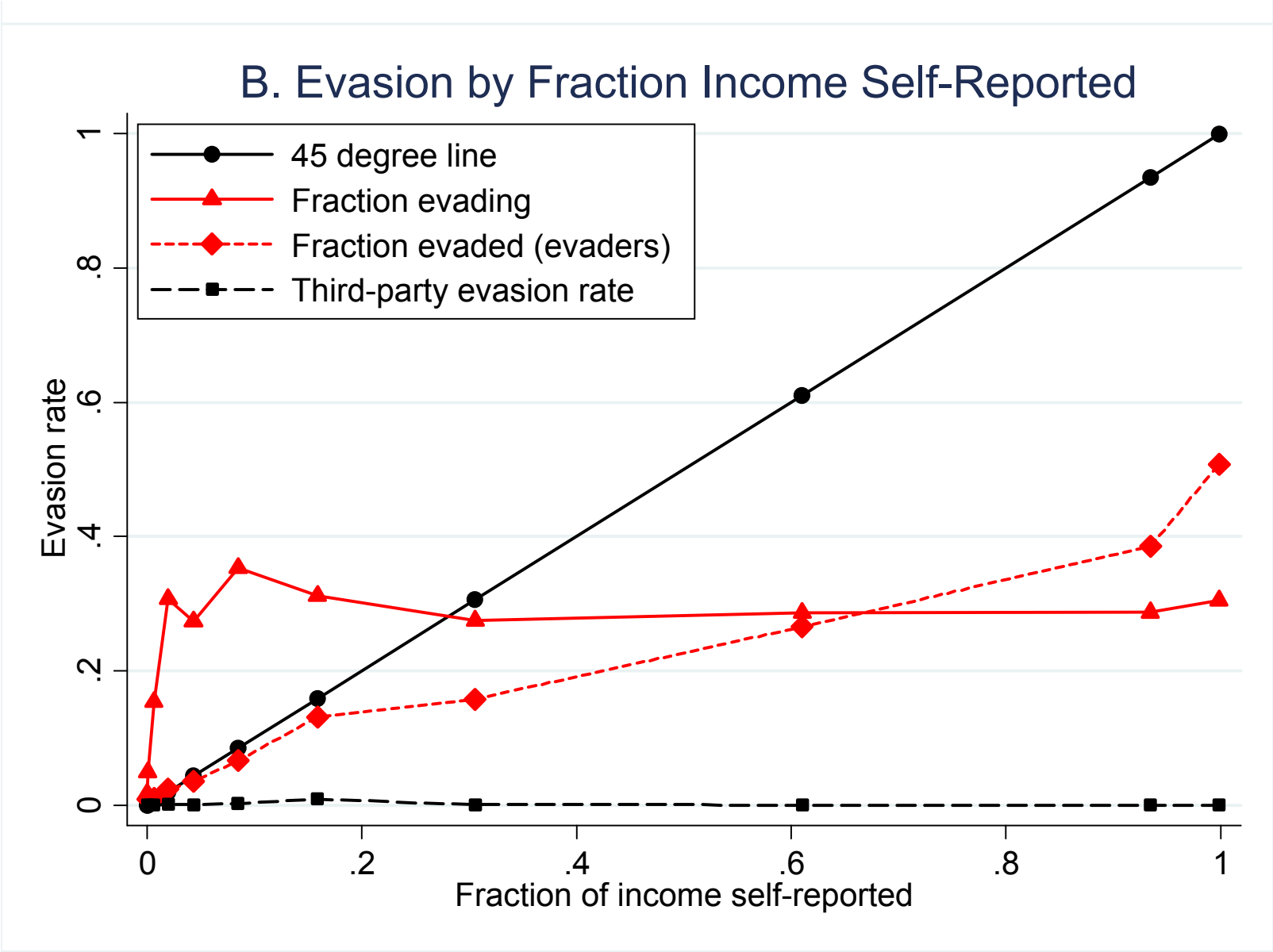
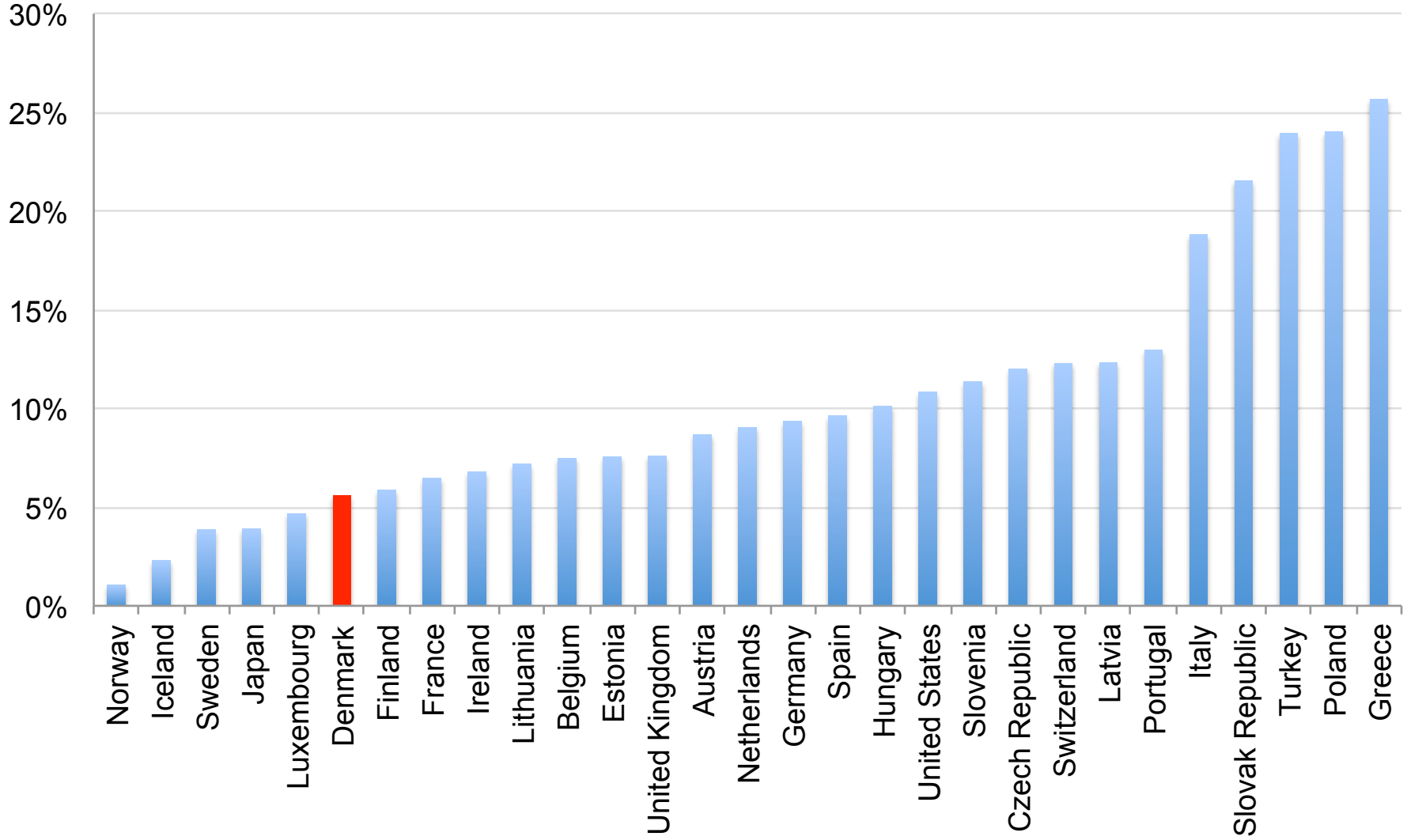


Figure 3. Anatomy of Tax Evasion[17]

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

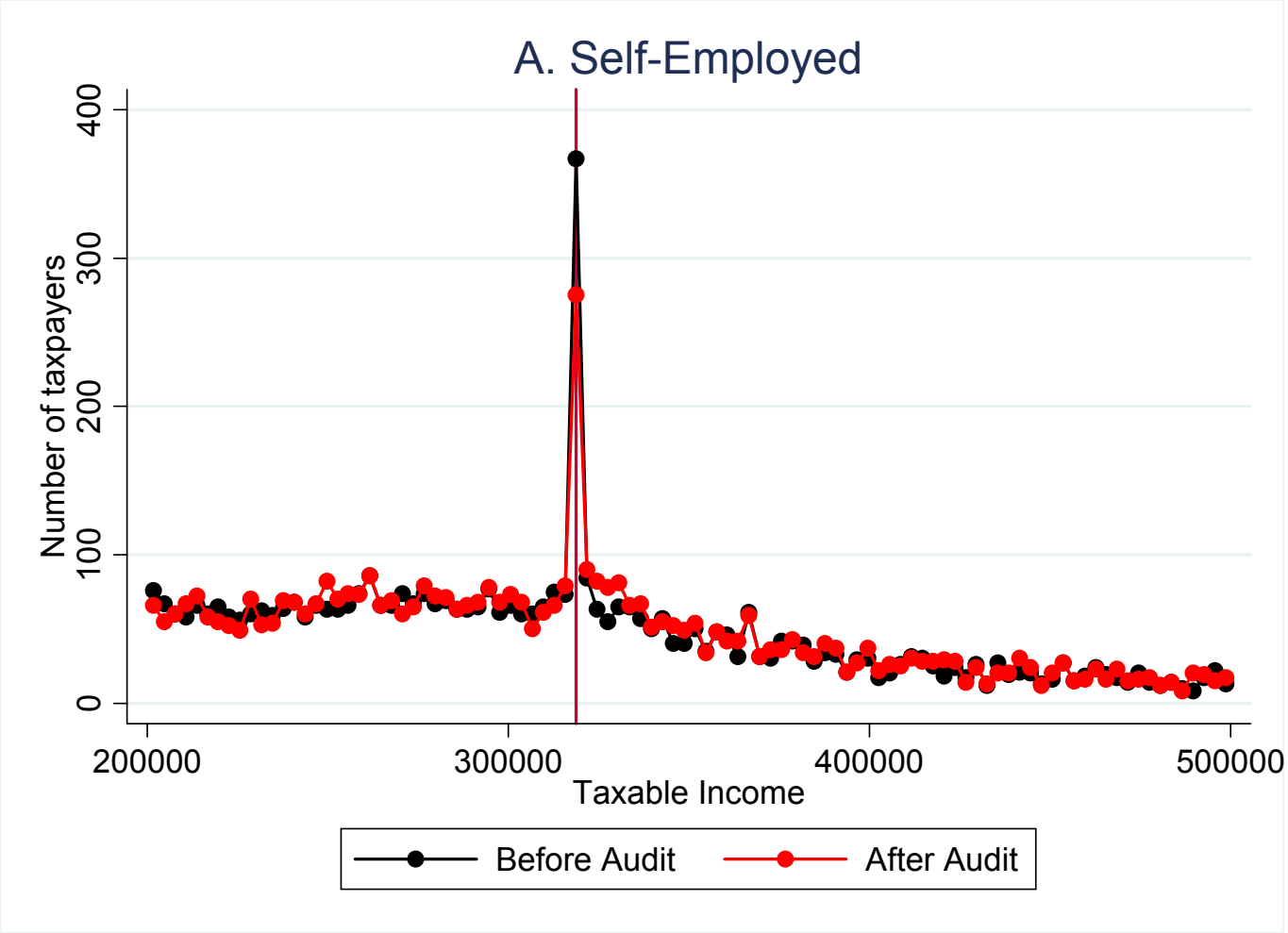
The share of self-employment income in GDP in OECD countries
(Gross mixed income as a % of factor-cost GDP)



The effect of marginal tax rates on evasion

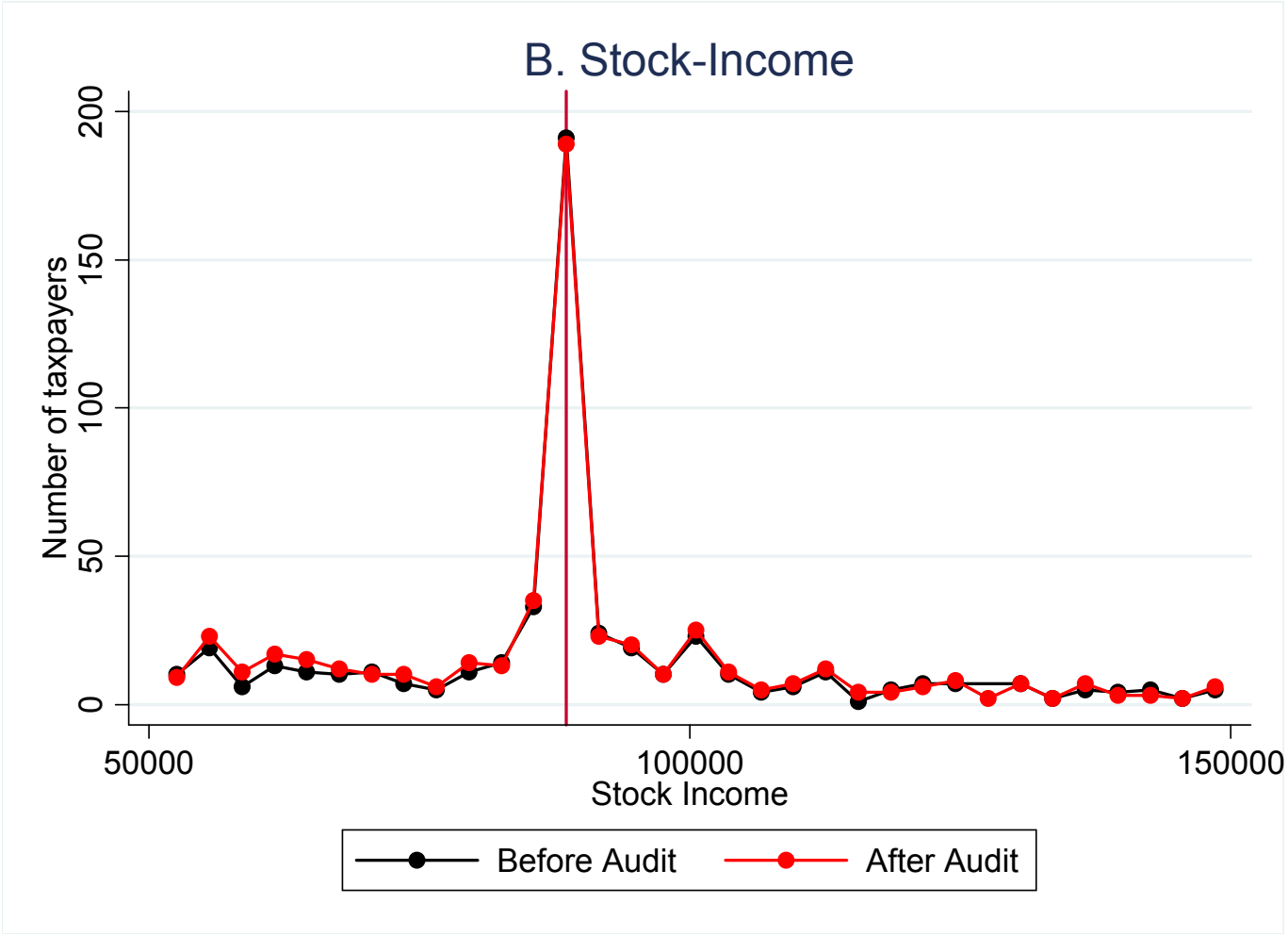
- Kleven et al. (2011) also provide quasi-experimental causal effects of marginal tax rates on evasion
- Use bunching evidence before and after audit
- Find most bunching not due to evasion but avoidance $\rightarrow$ effect of MTR on evasion is modest
- Information reporting is much more important than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

Tax evasion at the top

Hard to study with random audits:

- Small number of rich individuals sampled
- Hard to detect complex evasion involving intermediaries

$\rightarrow$ Random audits need to be supplemented with other sources to capture evasion by the wealthy

Data to capture evasion by the wealthy

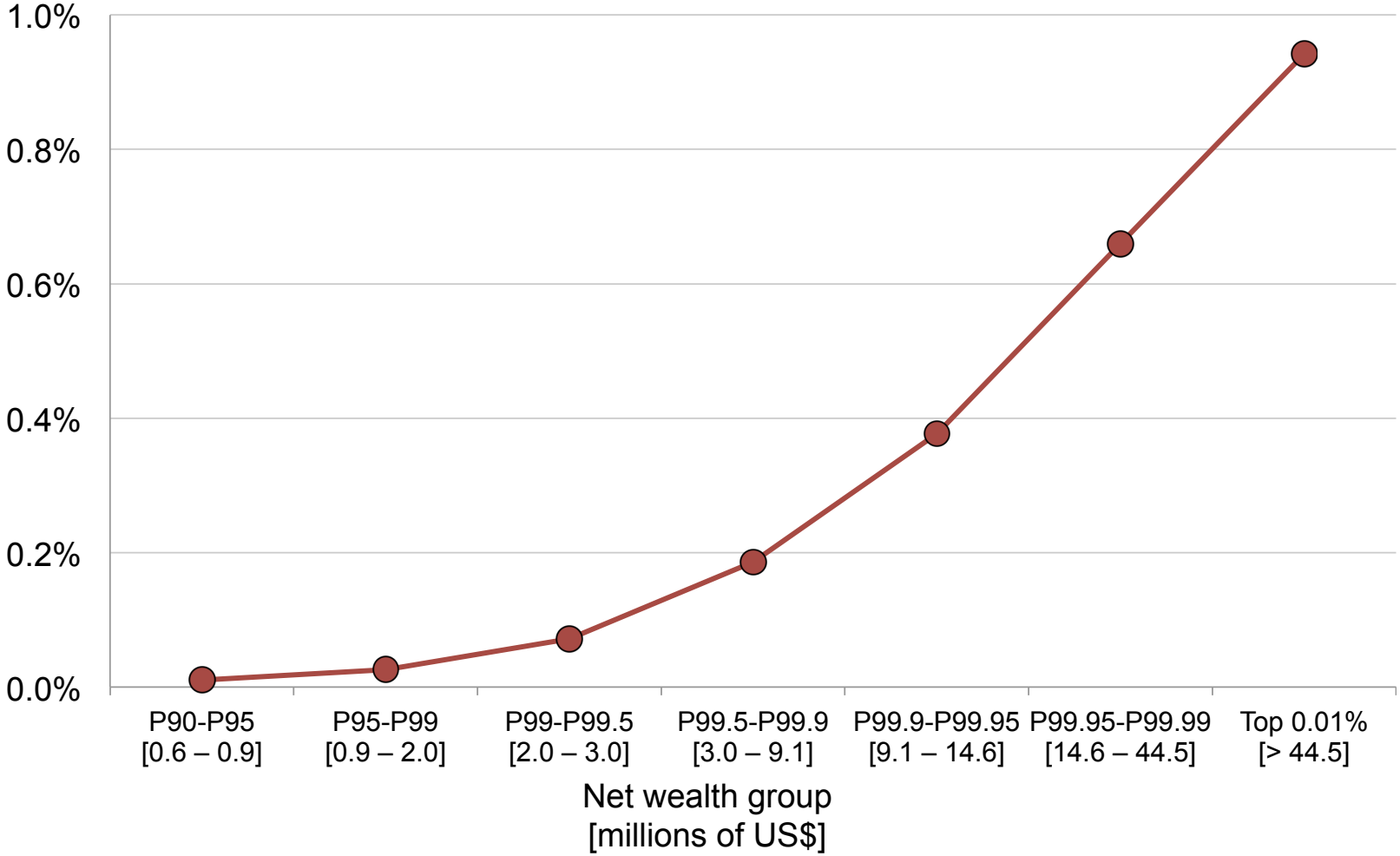
- Macro statistics on wealth held in tax havens (Zucman QJE 2013)
- Tax amnesties (eg, offshore voluntary disclosure program in the US: Johannesen et al. 2018)
- Leaks from providers of tax evasion services: Panama Papers, Swiss leaks, offshore leaks, etc. (Alstadsæter et al. AER 2019)

Alstadsæter et al. (AER 2019)

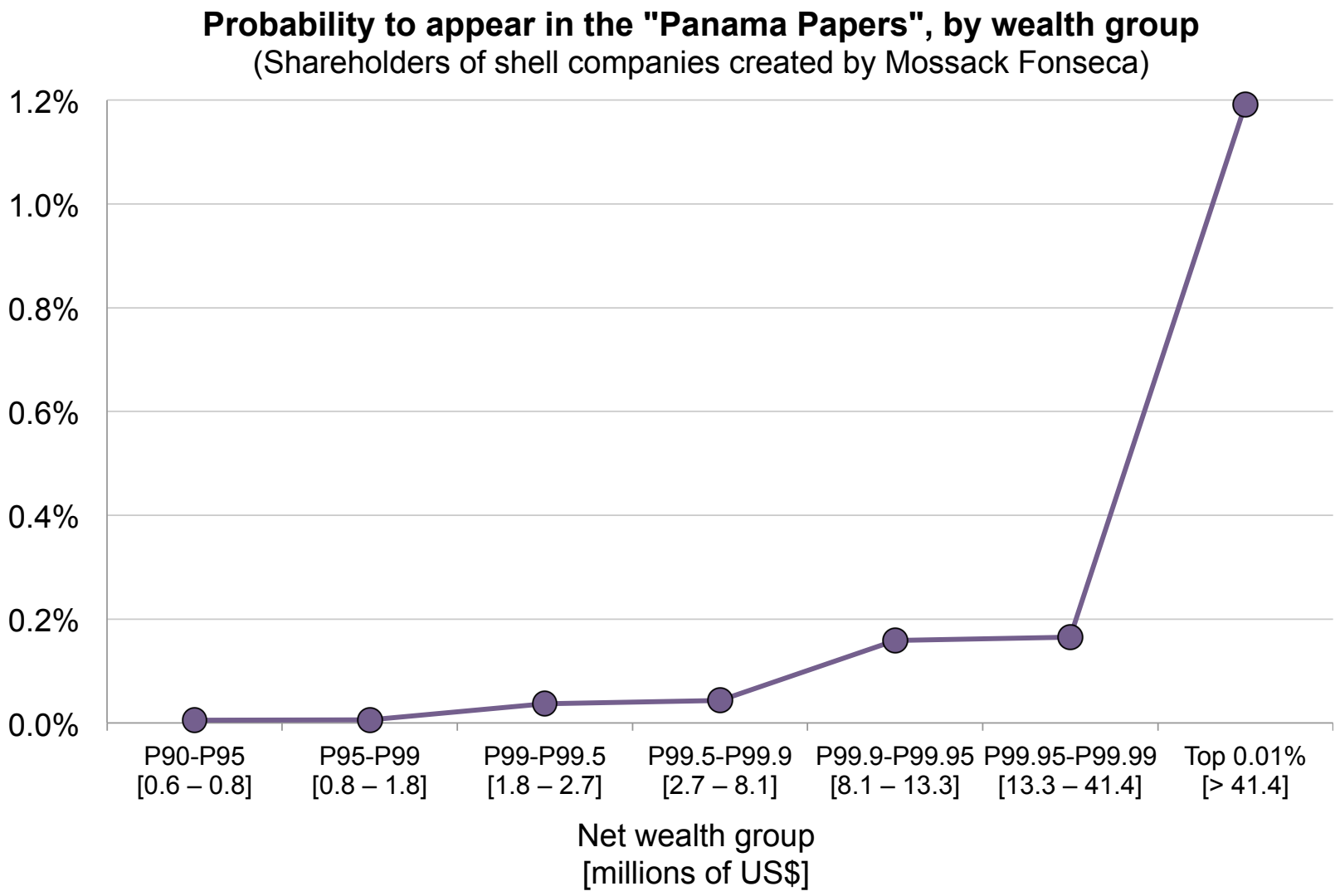
HSBC Switzerland leak (2007):

- Large bank ($\approx$ 5% of Swiss offshore wealth)
- Representative
- Recorded identity of beneficial owners
- Clear-cut way to identify evasion by linking to tax returns of clients
  $\rightarrow$ linking done in Scandinavia

Probability to own an unreported HSBC account, by wealth group
(HSBC leak)

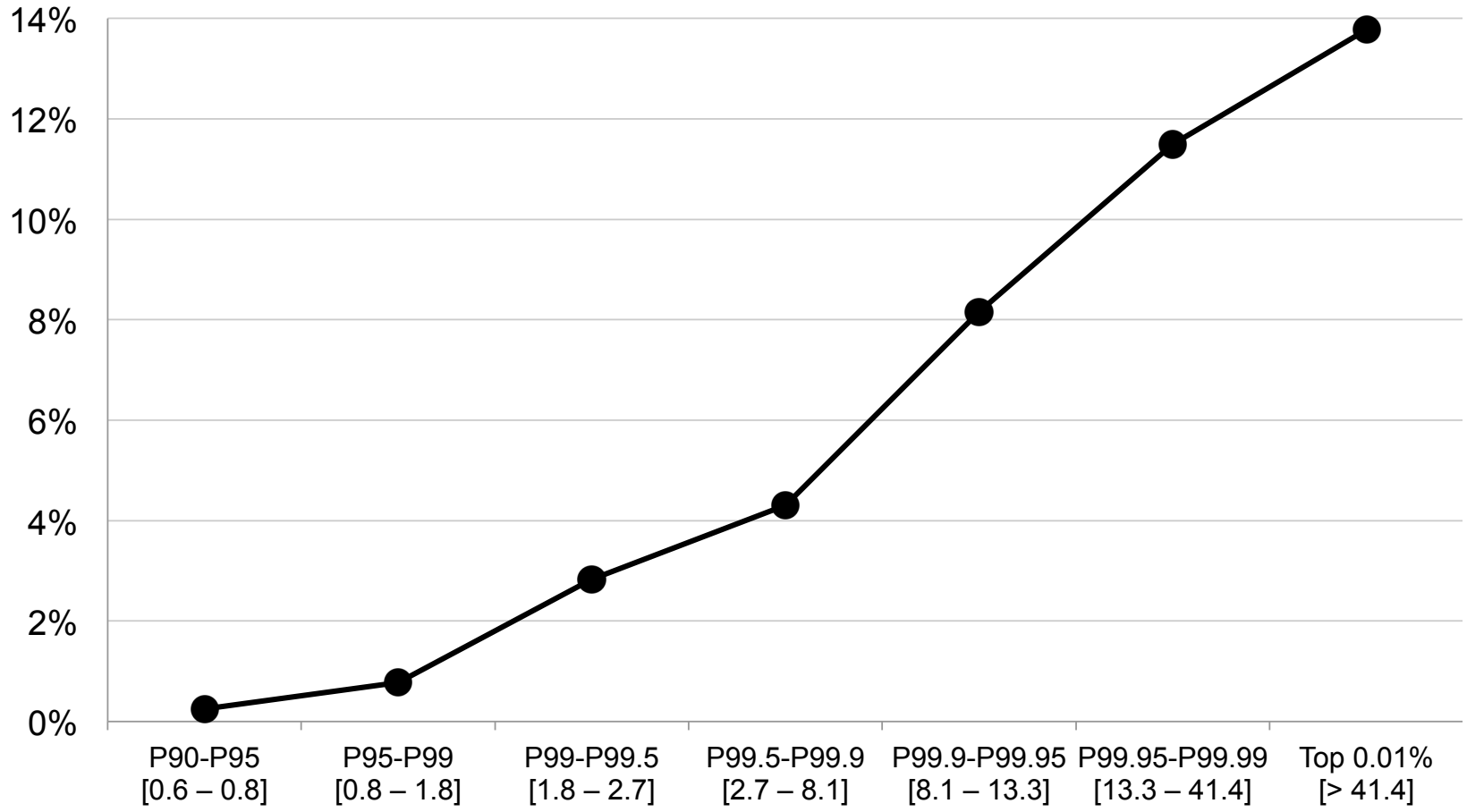


Source: Alstadsæter (2019)



Source: Alstadsæter (2019)

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



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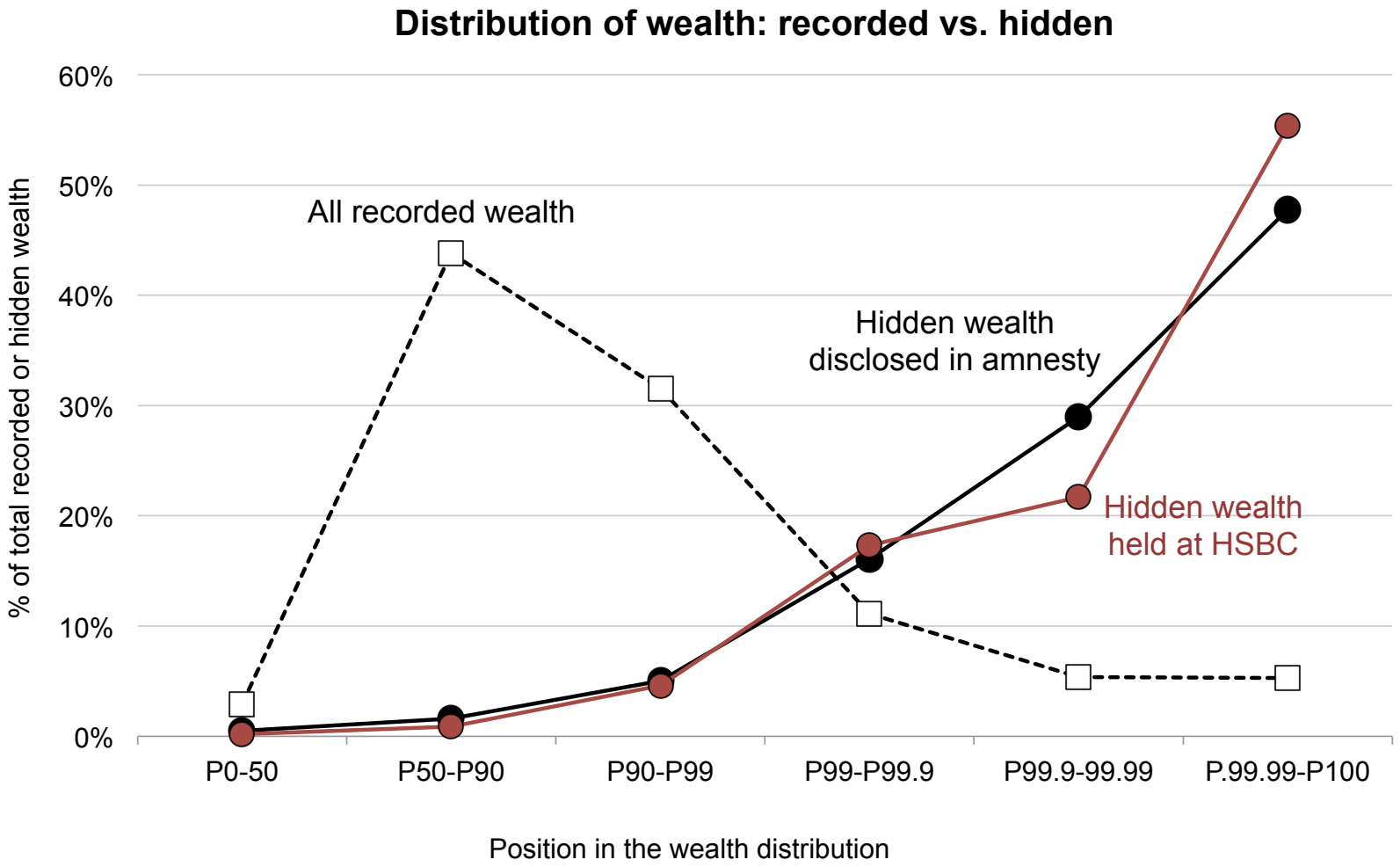

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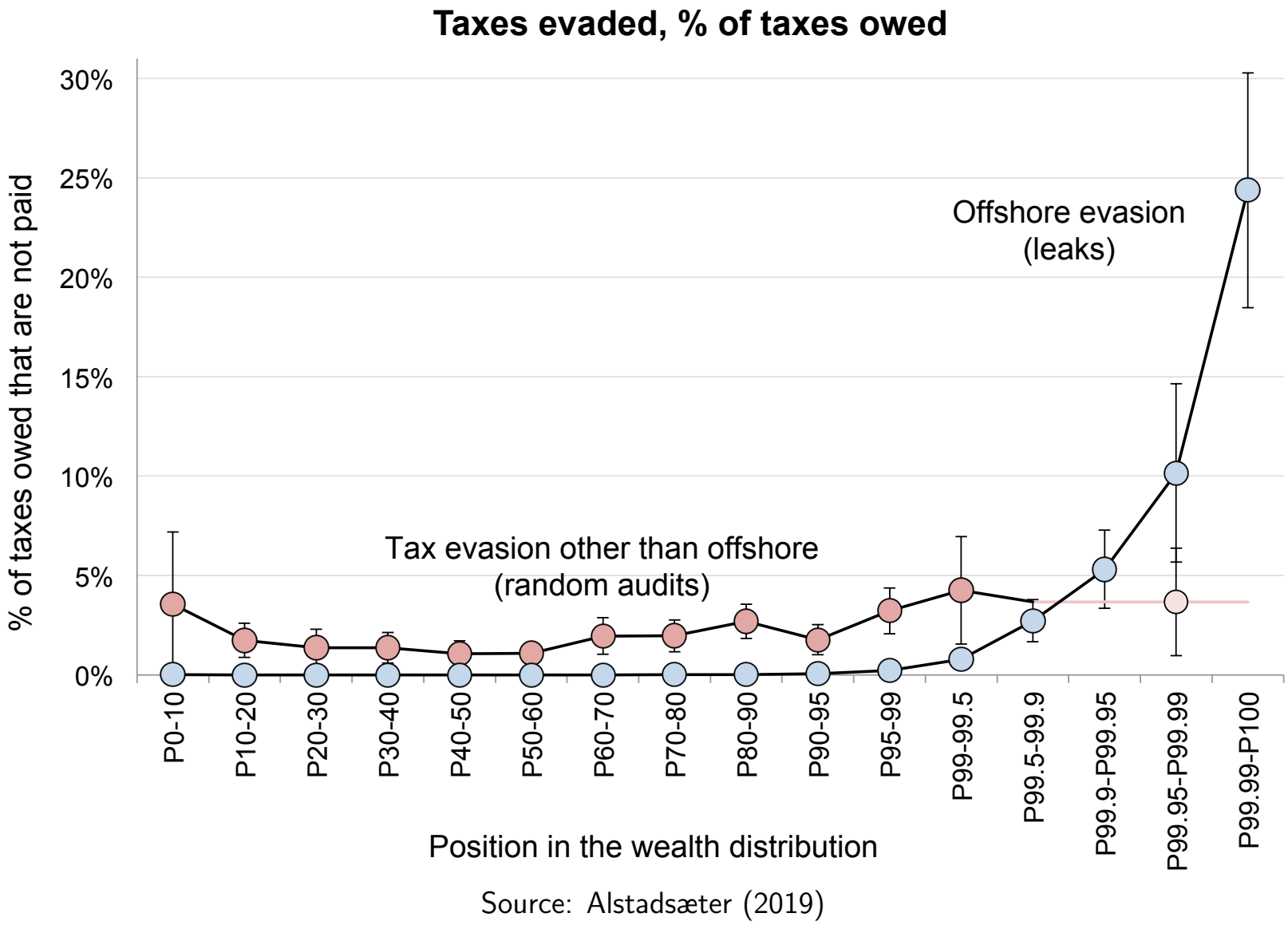


Source: Alstadsæter (2019)

Alstadsæter et al. (2019): model

Why high evasion rates at the top? Impossible to understand in AS model (= demand side). Need to study the supply

- 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:

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

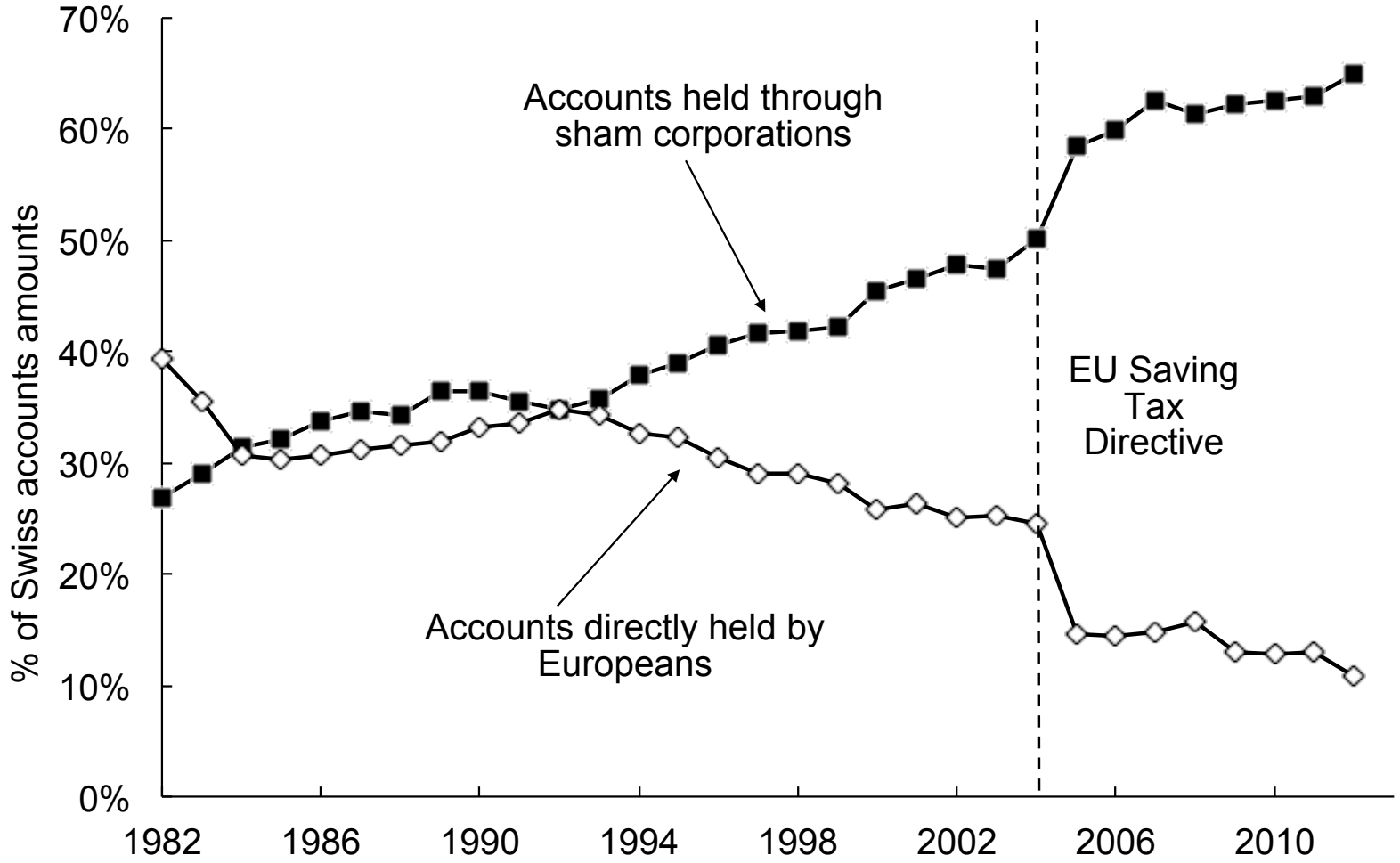
- b is the inverted Pareto-Lorenz coefficient (high $b \rightarrow$ high inequality)

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

- Increase detection probability λ: third-party reporting (but can be difficult to enforce internationally: need to learn from Fatca)
- 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?



Source: Zucman (2015)

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