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 ($\approx 10\%$ of taxes collected in the US), for government (administration) and private agents (compliance)
- Substantial tax evasion, especially in countries with high self-employment and at top of the wealth distribution
- 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)

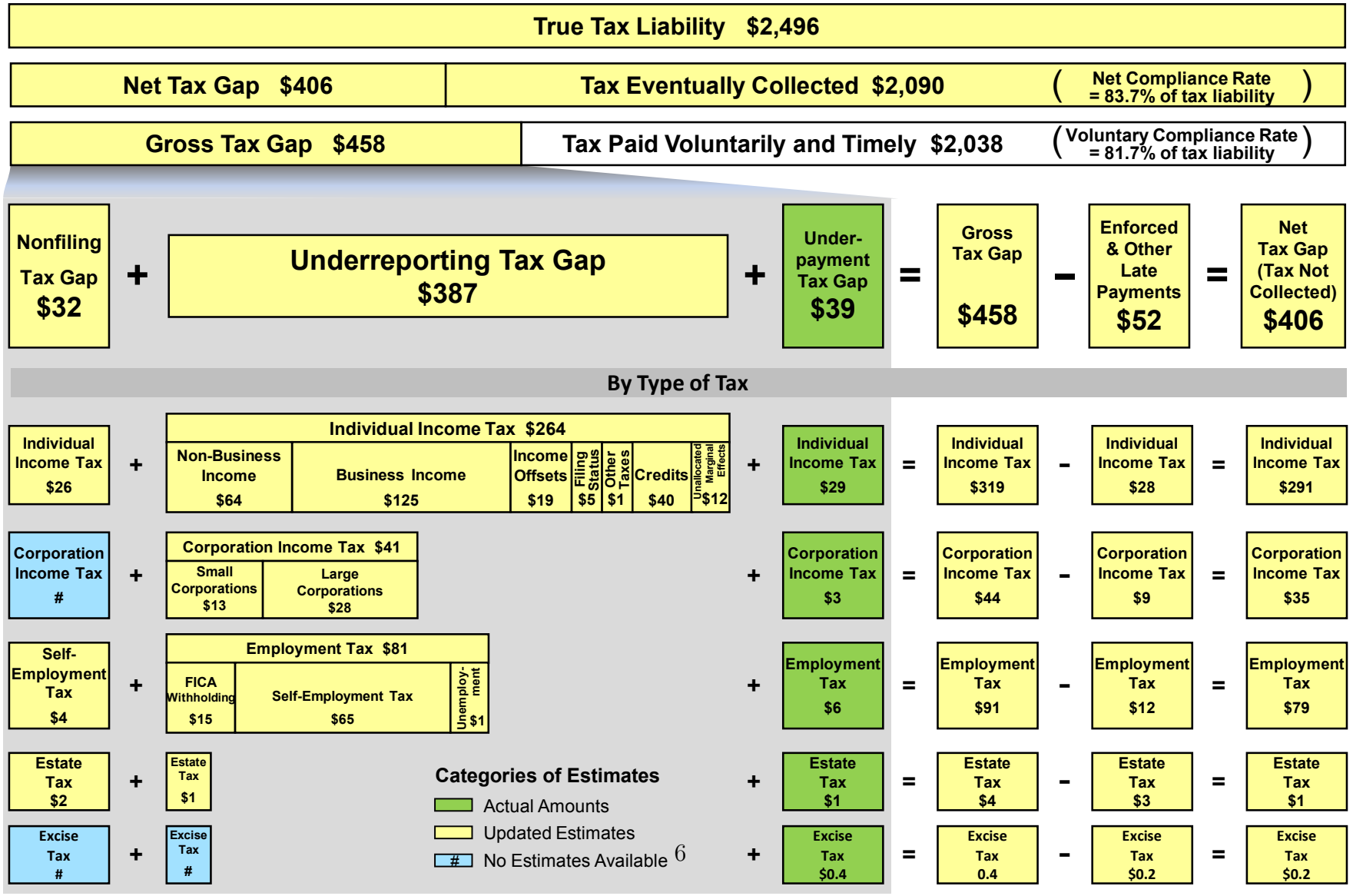
Tax gap in the United States

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

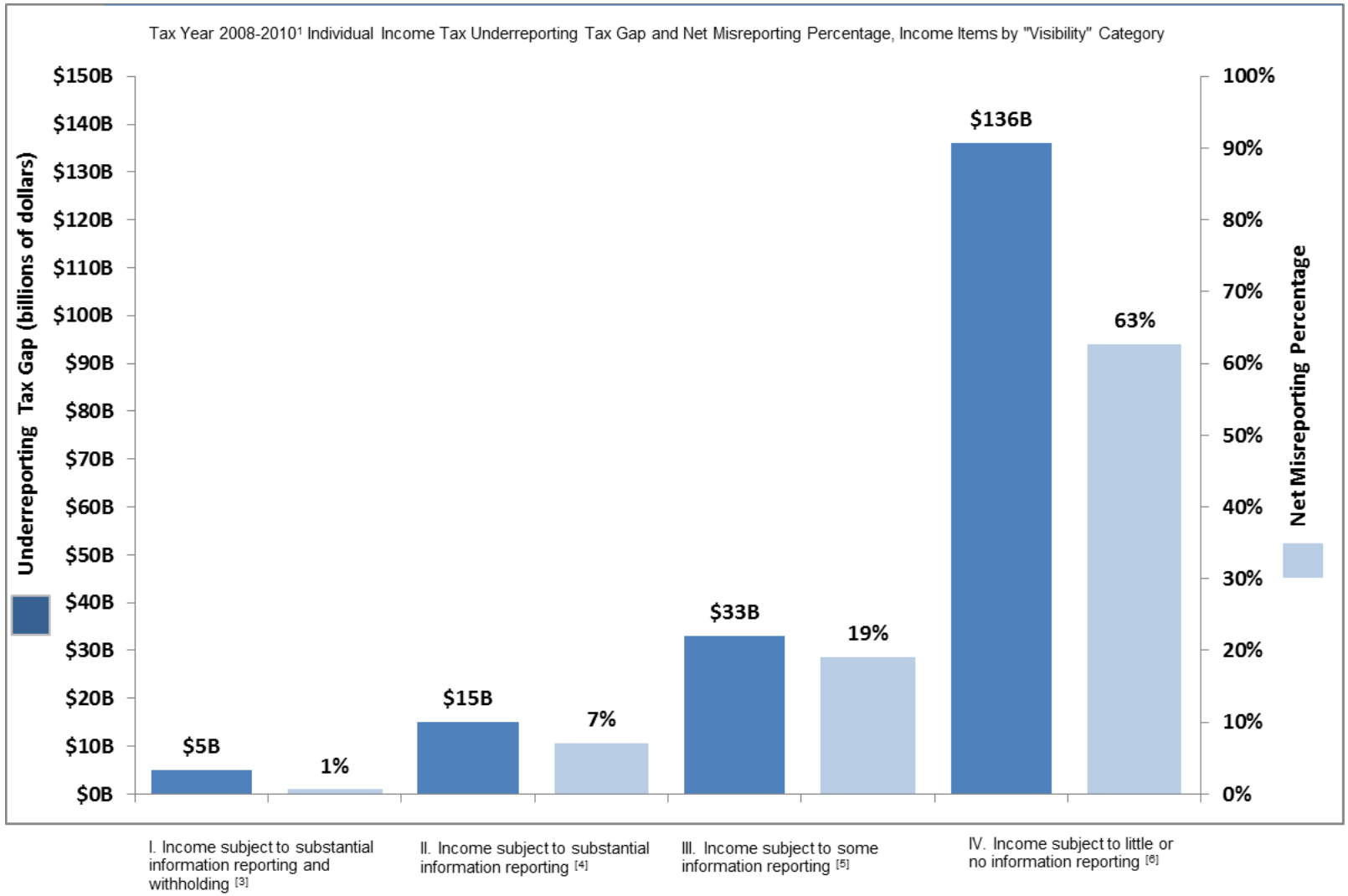
Tax Year 2008-2010 Annual Average ($ Billions)



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. Hugely 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)

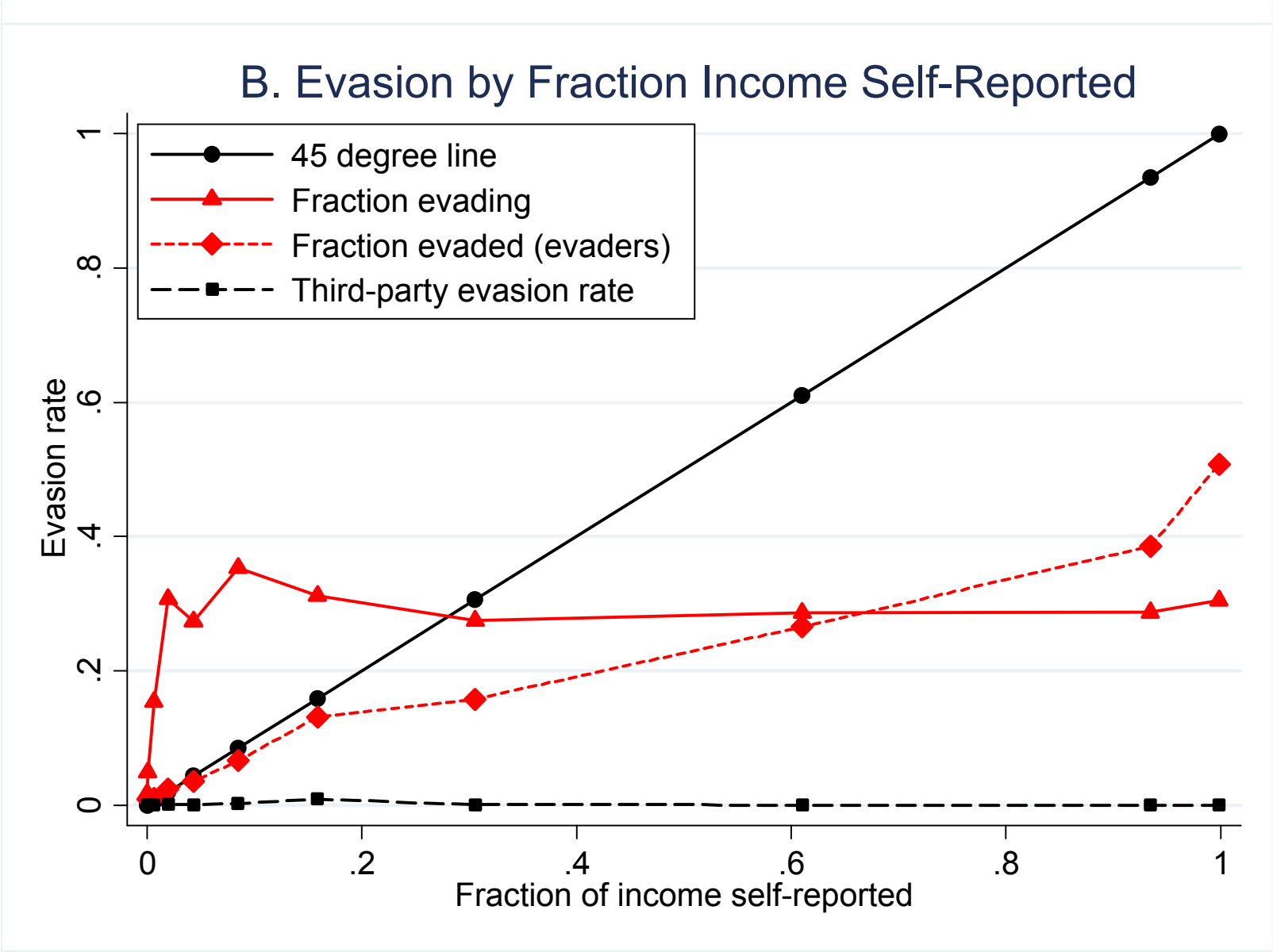
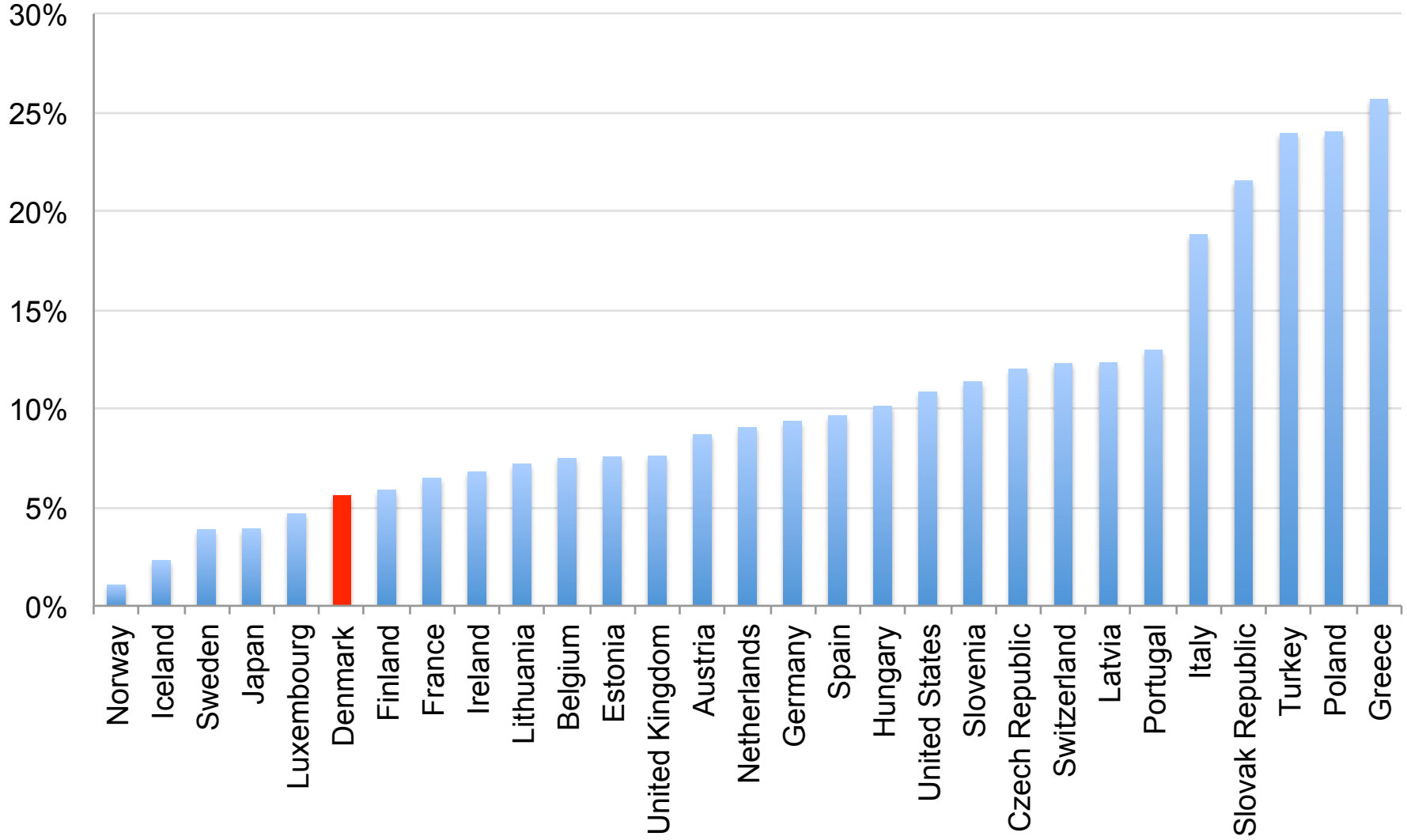


Figure 3. Anatomy of Tax Evasion[17]

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

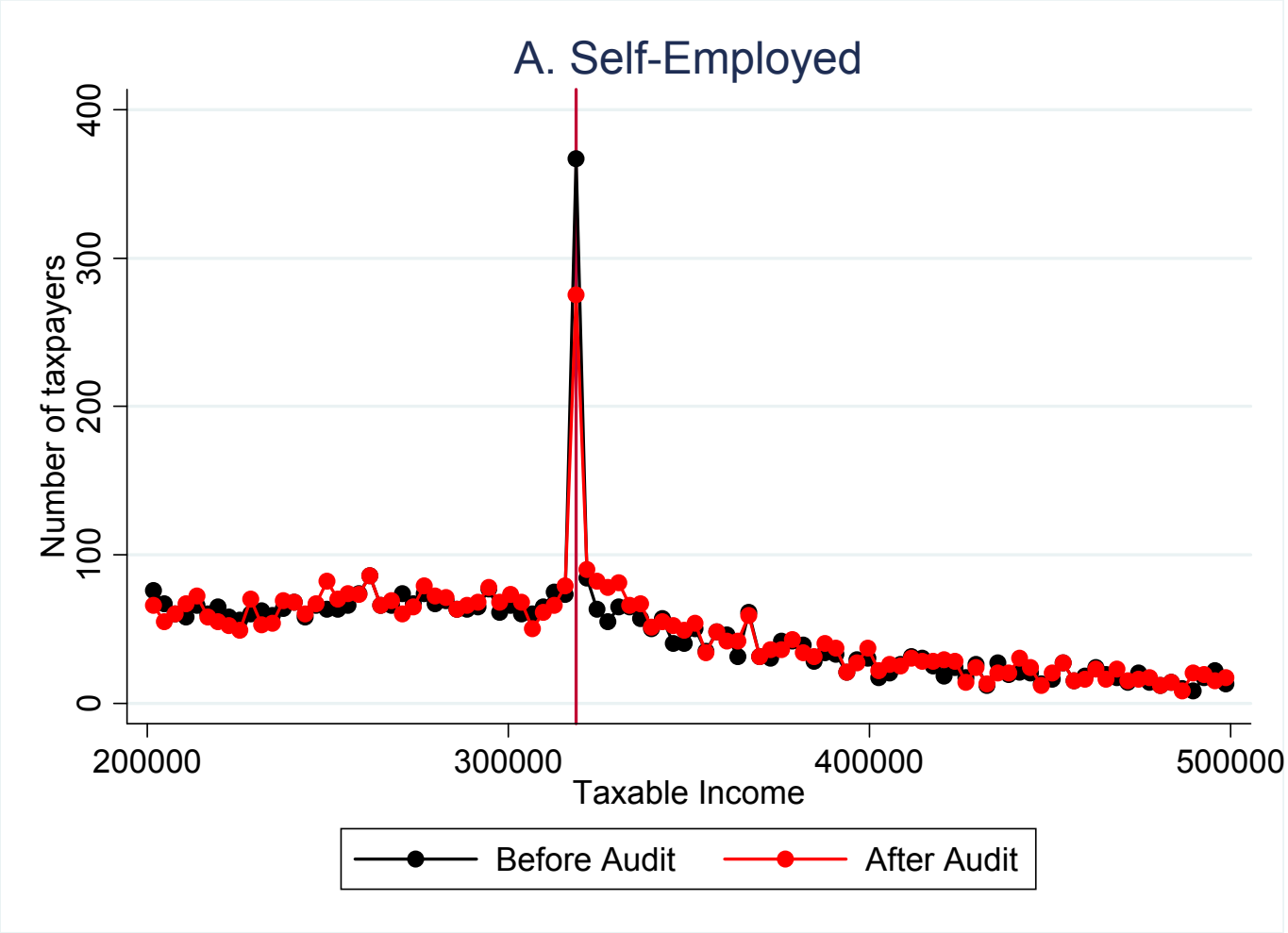
The share of self-employment income in GDP in OECD countries
(Gross mixed income as a % of factor-cost GDP)



The effect of marginal tax rates on evasion

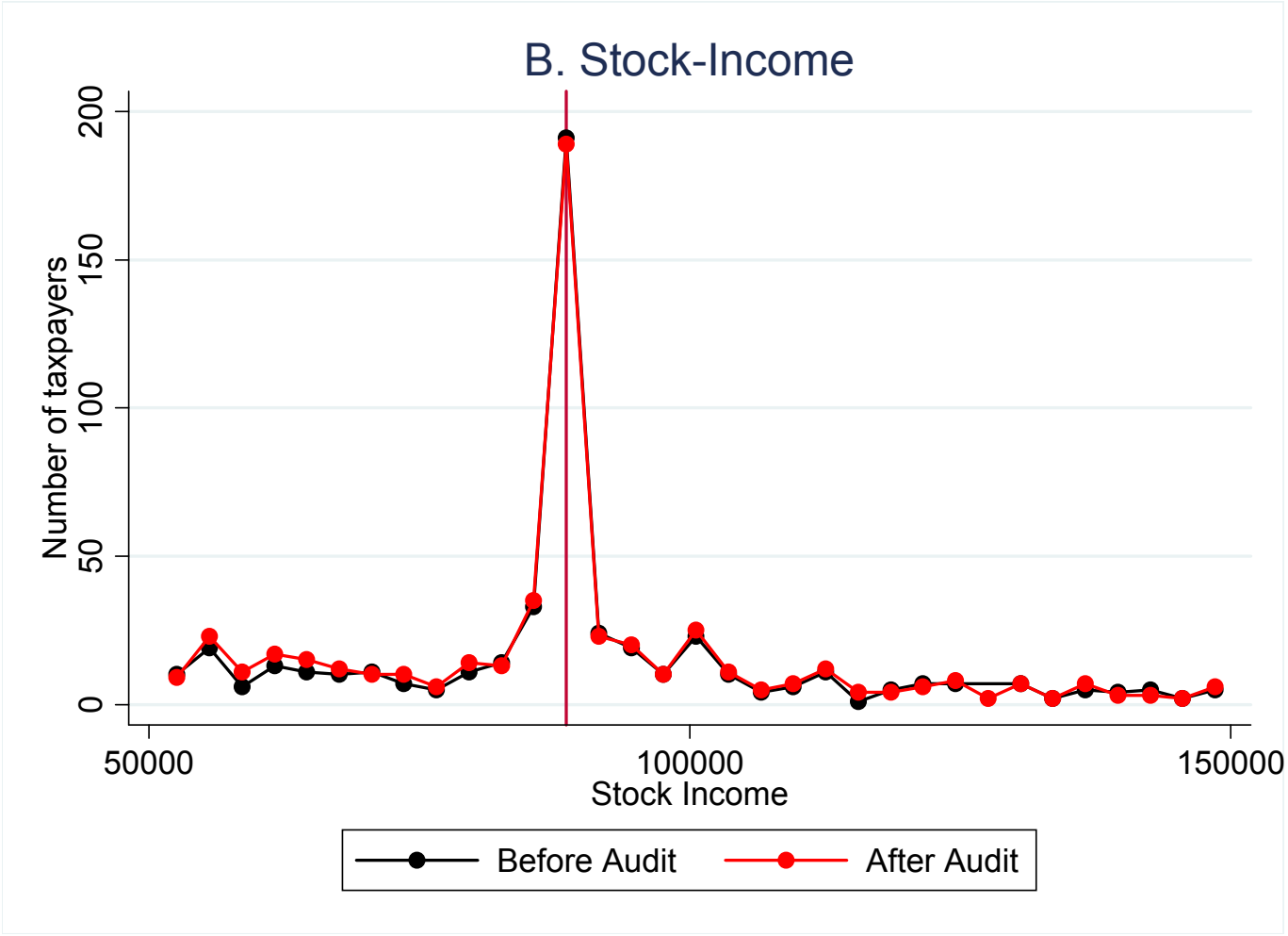
- Kleven et al. (2011) also provide quasi-experimental causal effects of marginal tax rates on evasion
- Use bunching evidence before and after audit
- Find most bunching not due to evasion but avoidance $\rightarrow$ effect of MTR on evasion is modest
- Information reporting is much more important than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



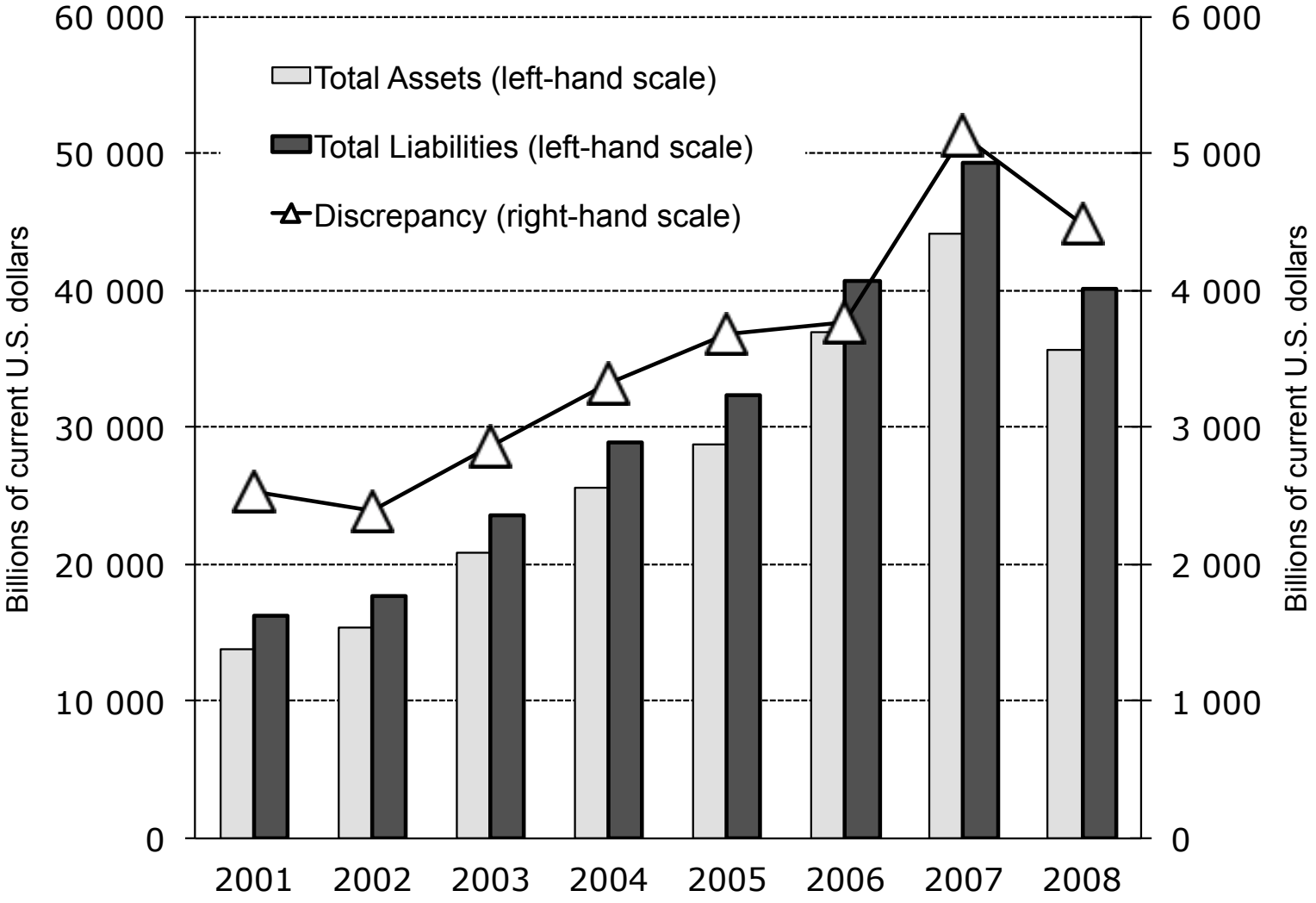
Source: Kleven et al. (2010)

3 Supply side of evasion services

- A whole industry facilitates tax evasion by selling wealth concealment services (numbered accounts, shell corporations, etc.)
- See Offshore Leaks, Swiss Leaks, Panama Papers...
- Such forms of evasion typically go undetected in randomized audit studies $\rightarrow$ very poorly known
- What are implications for size & distribution of tax evasion?
- And what determines the supply of evasion services?

Size of offshore wealth

- Monthly statistics by the Swiss National Bank
- Systematic anomalies in the international investment positions of countries caused by offshore portfolio wealth
- 8% of the world's financial wealth offshore (Zucman' 13, '14, '15)
- If anything lower bound (only includes financial assets, excludes art, real estate, etc.)



Source: Zucman (2013)

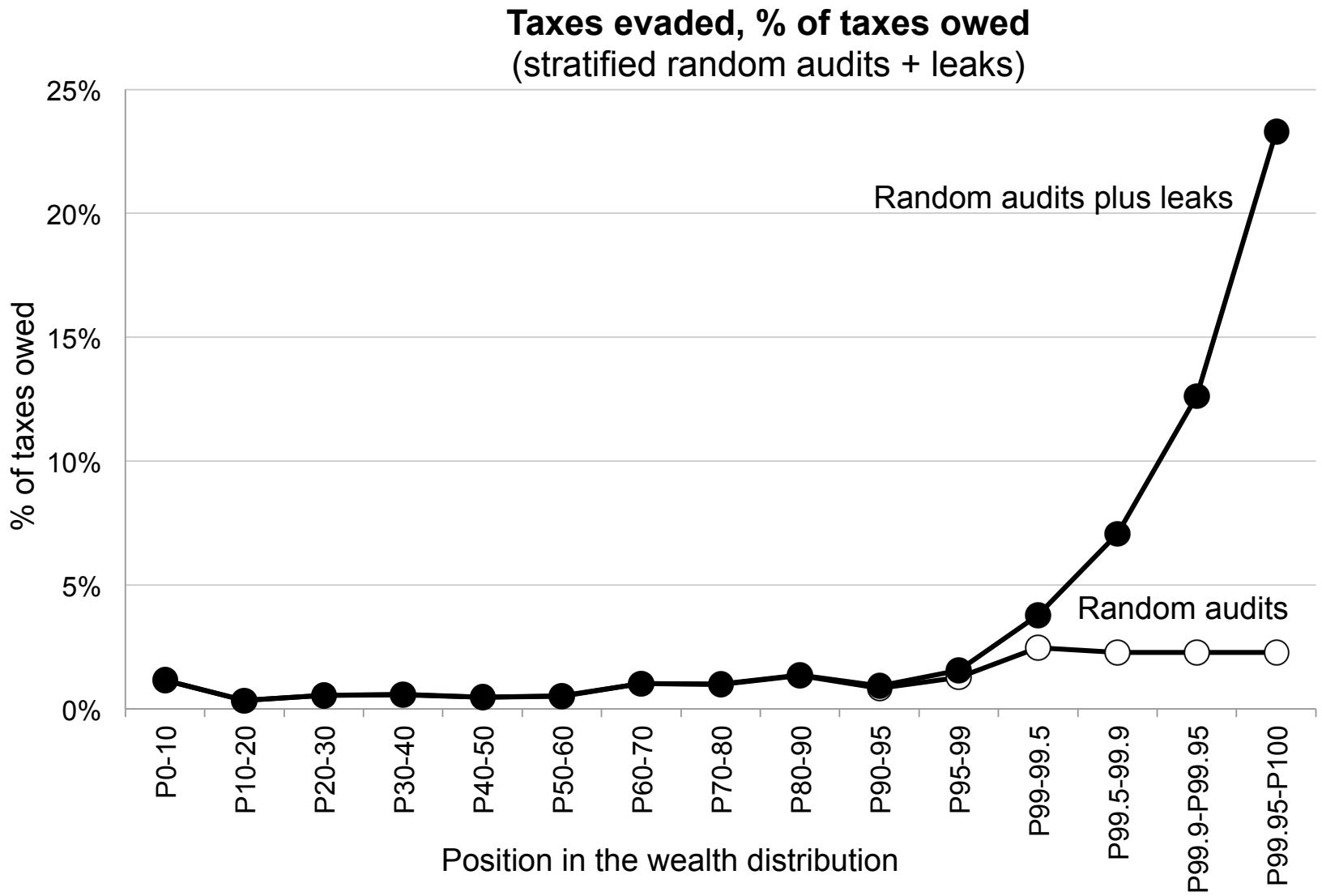
	Offshore wealth ($ bn)	Share of financial wealth held offshore	Tax revenue loss ($ bn)
Europe	2,600	10%	75
USA	1,200	4%	36
Asia	1,300	4%	35
Latin America	700	22%	21
Africa	500	30%	15
Canada	300	9%	6
Russia	200	50%	1
Gulf countries	800	57%	0
Total	**7,600**	**8.0%**	**190**

Source: Zucman (2014)

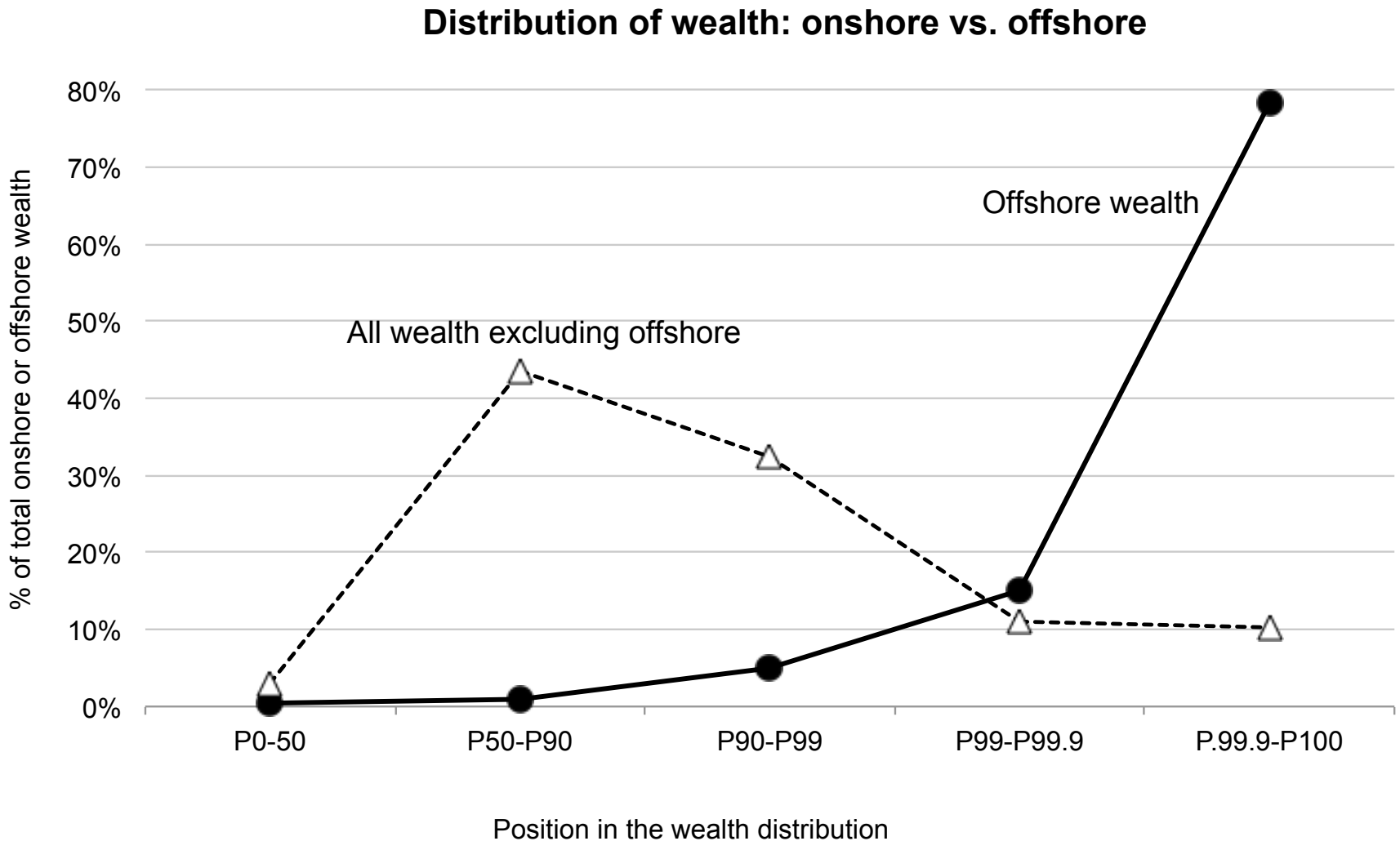
Distribution of undetected evasion

Alstadsæter, Johannesen & Zucman (2017) study leaks from HSBC Switzerland

- Leak random & from big, representative intermediary
- Match to population-wide tax records in Norway, Sweden, Denmark
- Combine with high quality random audit studies to capture size and distribution of—detected and previously undetected—tax evasion in Scandinavia



Source: Source: Alstadsæter, Johannesen and Zucman (2016)



Source: Alstadsæter, Johannesen and Zucman (2016)

Alstadsæter, Johannesen & Zucman (2017): model

- 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
- Simplification: infinitely elastic demand at price $\theta \rightarrow$ bank optimizes on the number of clients it serves
- 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 (instantaneous proba λ per client) $\rightarrow$ triggers fine $\phi k(s)$

Risk-neutral bank maximizes profits

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

At interior optimum:

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

- 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:

$$s = \frac{\theta}{\left(\frac{a}{a-1} + 1\right) \phi \log(\frac{1}{1-p})}$$

- $p = 1 - e^{-\lambda}$ is the probability that the bank is caught when it serves the full population
- a is the Pareto coefficient (low $a \rightarrow$ high inequality)

When inequality high, bank will serve a tiny fraction of the population

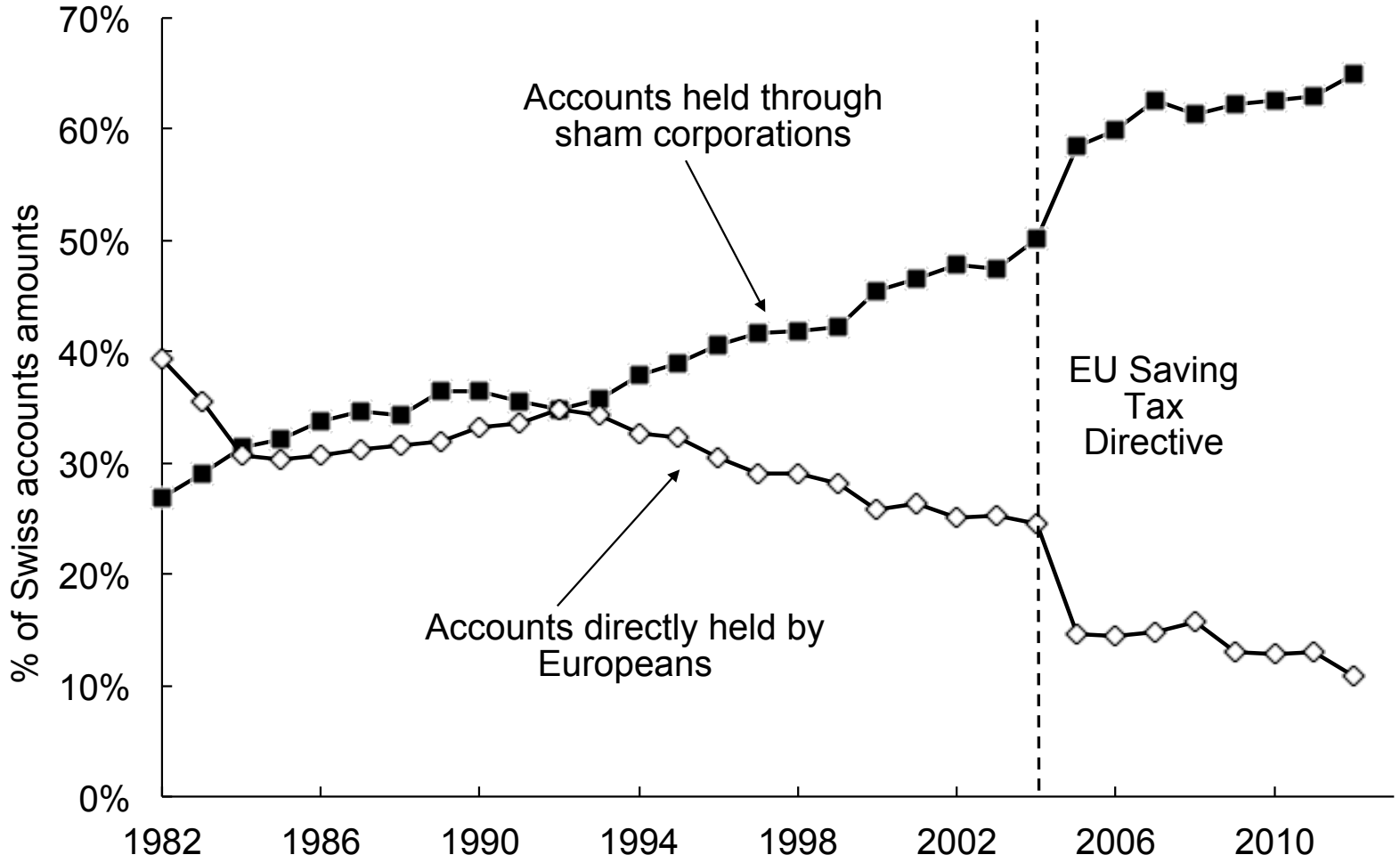
Higher p or higher $\phi \rightarrow$ fewer & richer clients

Policies to curb international tax evasion

- Automatic exchange of bank information (FATCA law in US)
- Extends 3rd party reporting internationally $\rightarrow$ could in principle reduce evasion

Key question: incentives to provide truthful information?

- Depends on incentives of offshore bankers, size of banks (whistleblowing less likely in small firms), penalties, inequality
- Past experience (European Saving Tax Directive) not promising (Zucman 2013, Johannesen and Zucman 2014, Omartian 2017)



Source: Zucman (2015)

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