

Tax Evasion: Information, Supply, Norms

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Outline

1. Measuring the size of tax evasion
2. Measuring the distribution of tax evasion
3. Why do people evade taxes?

Measuring the Size of Tax Evasion

Measuring tax evasion with randomized audit studies

Widely used source to study tax evasion: stratified random audits

- ▷ In the US: IRS conducts thorough audits of stratified sample of tax returns periodically → 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 → some taxpayers can never pay taxes owed unless withheld at source)

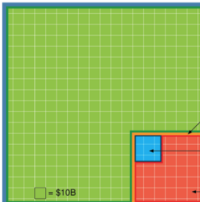
IRS tax gap studies

Tax Gap Estimates for Tax Years 2011-2013

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



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 5.8% Net Compliance Rate (NCR)

Calculating the Net Tax Gap

$$\begin{aligned} & \text{Nonfiling} \\ & \text{Underreporting} \\ & + \text{Underpayment} \\ & \hline & \text{Gross Tax Gap} \\ & - \text{Enforced \& Other Late Payments} \\ & \hline & \text{Net Tax Gap} \end{aligned}$$

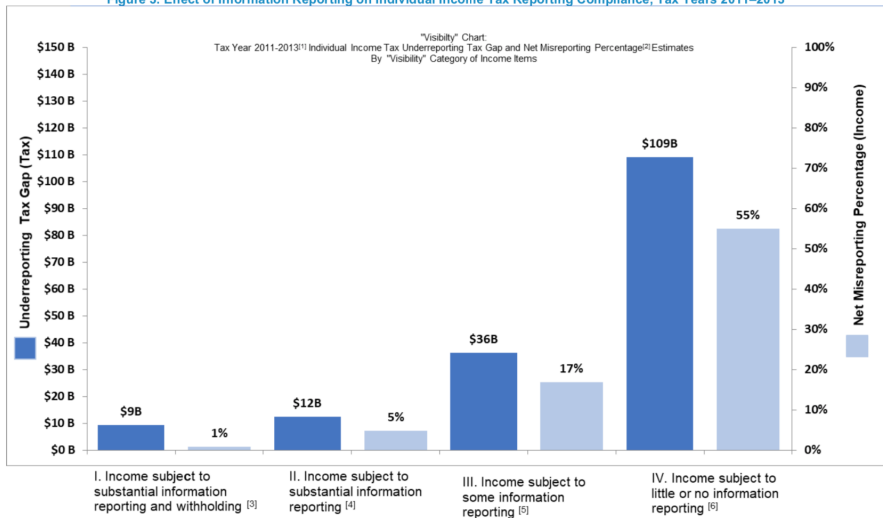
Total True Tax Liability	Tax Paid Voluntarily & Timely	Gross Tax Gap						Enforced & Other Late Payments	Net Tax Gap (Tax Not Collected)			
\$2,683	\$2,242	Nonfiling	Underreporting						Underpayment	\$441	\$60	\$381
Individual Income Tax	Individual Income Tax	Individual Income Tax	Individual Income Tax						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	Non-Business Income [1]	Credits	Income Offsets [1]	Filing Status [2]	Other Taxes [2]	Unallocated Marginal Effects [3]			
			\$110	\$57	\$42	\$20	\$5	\$1	\$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 Corporations	Small Corporations								
			\$26	\$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-Employment Tax	FICA & Uncollected FICA TAX	Unemployment							
			\$45	\$24	\$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.

IRS tax gap studies

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? In the US, an adjustment is made to account for undetected evasion

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

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

- ▷ Where $Y_{1i}^* = X_{1i}\beta_1 + \epsilon_{1i}$ latent var measuring propensity to evade
- ▷ Problem: only fraction of evasion is detected

Detection controlled estimation (DCE)

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

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

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

- ▷ Where $Y_{2i}^* = X_{2i}\beta_2 + \epsilon_{2i}$ is latent variable measuring fraction of evasion detected (cond. on evasion)
- ▷ X_{2i} : examiner's experience, complexity of return, etc.

Detection controlled estimation: Limits

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

- ▷ Intuition: some examiners find more evasion → if all examiners were like them, total evasion would be $3 \times$ detected evasion
- ▷ But results sensitive to parametric assumptions (examiners not randomly assigned)
- ▷ Absolute detection rates not identified (can't know if top examiner captures 100% of evasion or less)

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

Measuring the Distribution of Tax Evasion

Supplementing random audits with other sources

Random audits can also be used to measure distribution of tax evasion

Main limit: hard to detect sophisticated evasion at the top

- ▷ Lack of resources in tax authorities
- ▷ Corporate/individual interface

→ Need to combine random audits with other sources

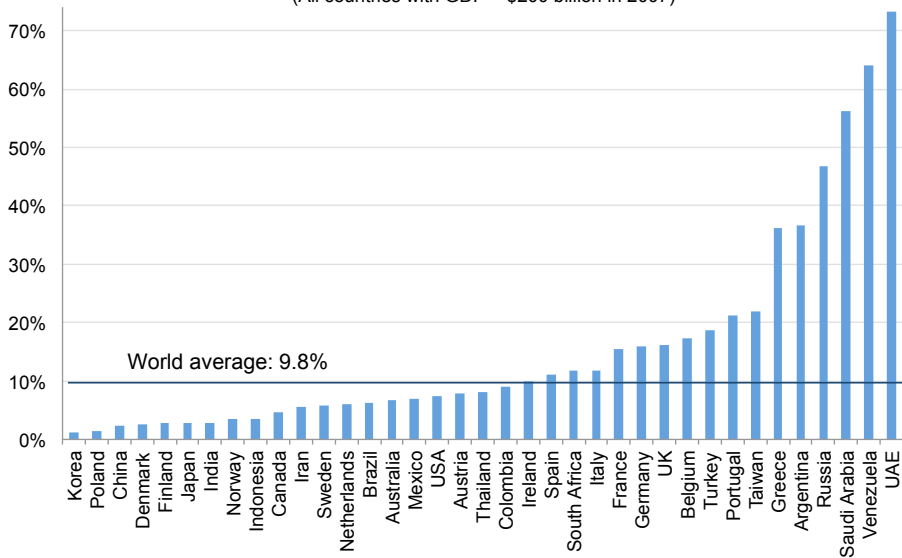
Measuring sophisticated top-end evasion

Data to capture sophisticated evasion:

- ▷ Macro statistics on wealth held in tax havens: tax haven central banks, BIS (Zucman, 2013; Johannesen and Zucman, 2014; Alstadsæter et al., 2018)
- ▷ Leaks: Panama Papers, Swiss leaks, offshore leaks, etc. (Alstadsæter et al., 2019; Londoño-Vélez and Avila-Mahecha, 2021)
- ▷ Tax amnesties (e.g., US: Guyton et al., 2021; Argentina: Londoño-Vélez & Tortarolo, 2022; Netherlands: Leenders et al., 2023)

Financial wealth equivalent to 10% of world GDP is held in tax havens

Offshore wealth / GDP
(All countries with GDP > \$200 billion in 2007)

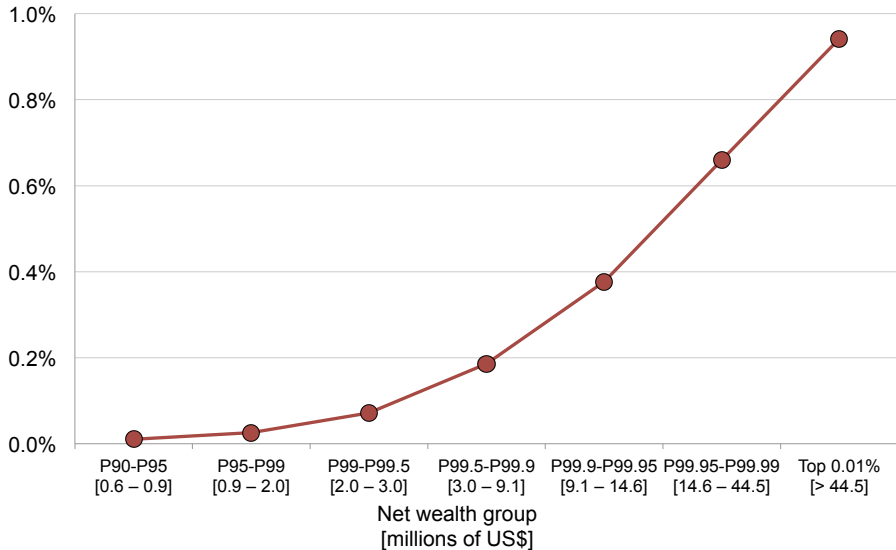


Alstadsæter et al. (2019)

- ▷ 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

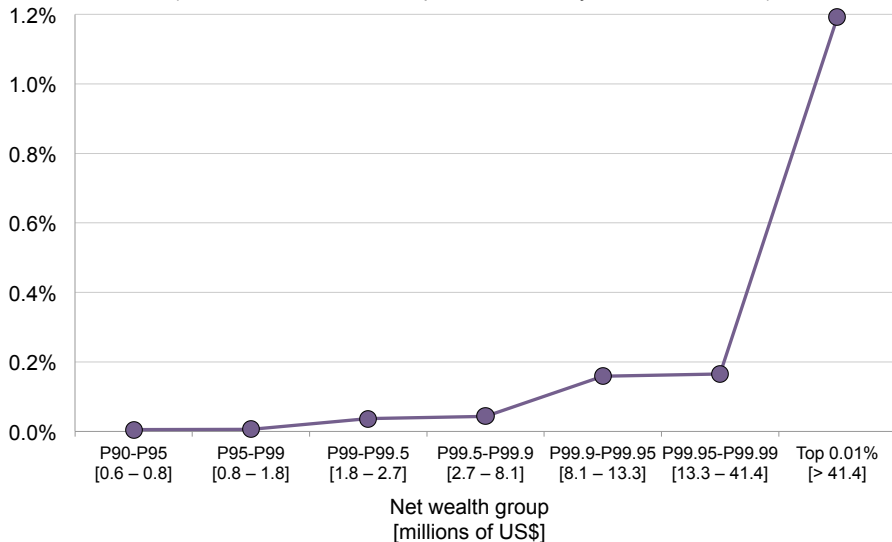
Probability to own hidden assets at HSBC Switzerland

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



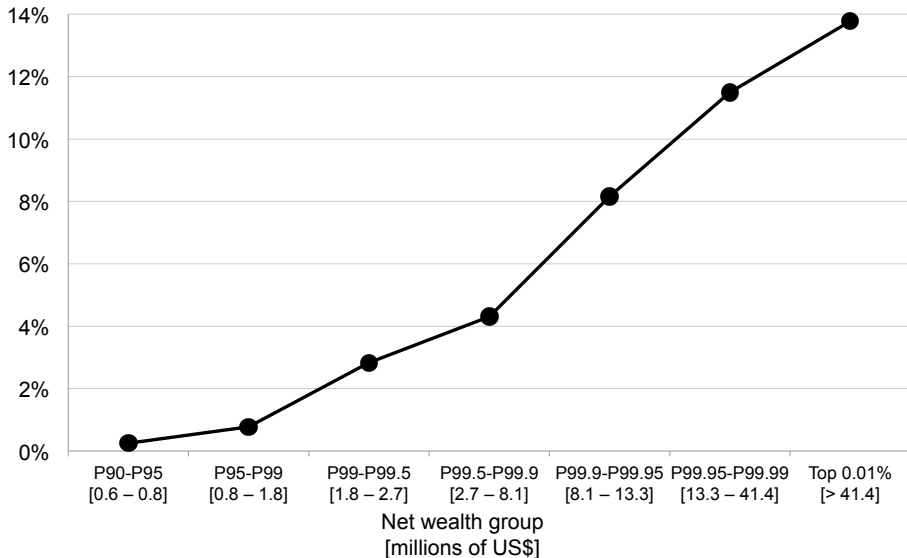
Probability to appear in the Panama Papers

Probability to appear in the "Panama Papers", by wealth group
(Shareholders of shell companies created by Mossack Fonseca)

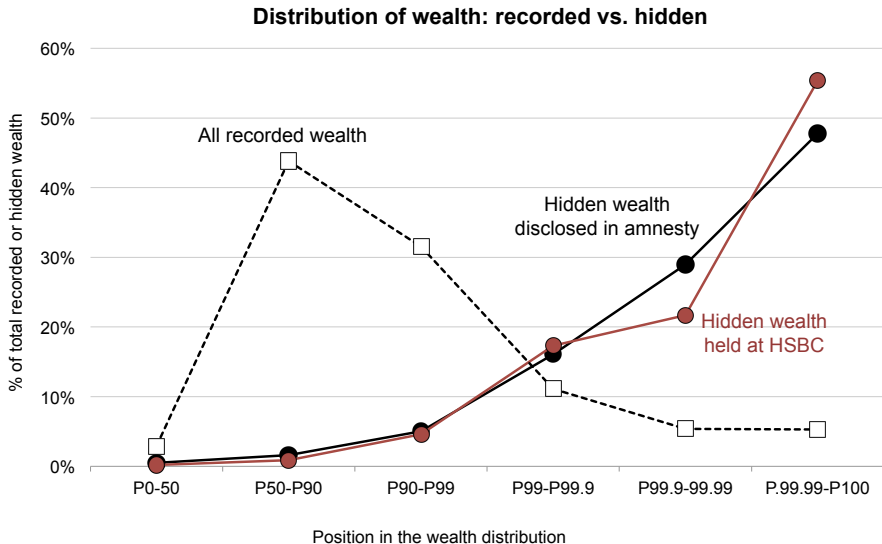


Probability to disclose hidden assets in a tax amnesty in Scandinavia

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



Distribution of offshore assets

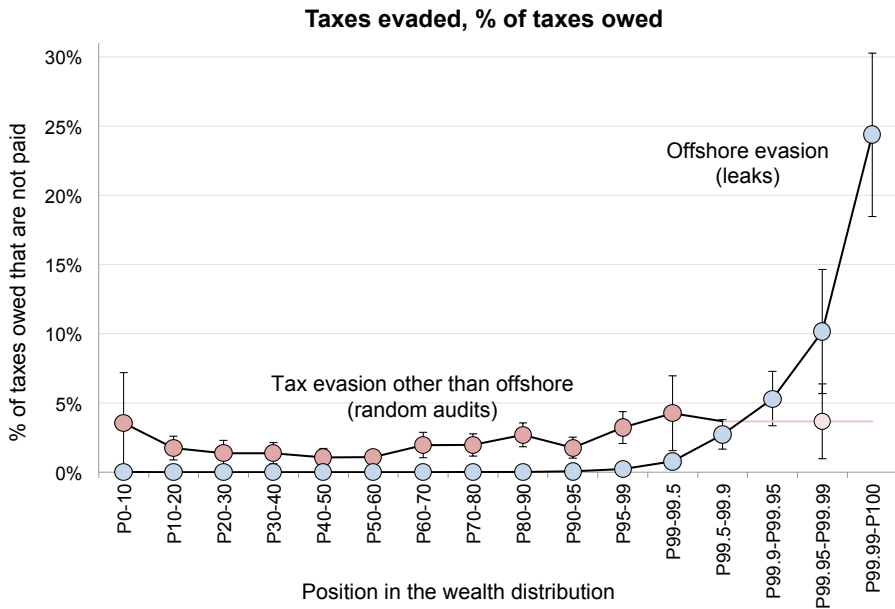


Distributional Tax Gaps

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

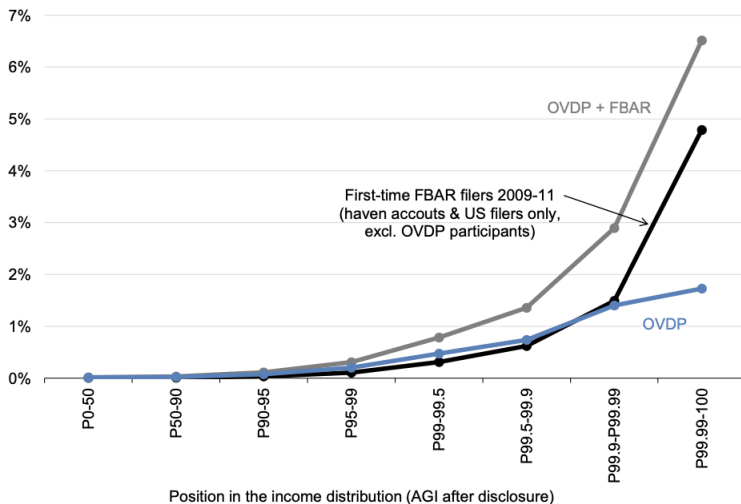
- ▷ Make assumptions on stock of offshore wealth (based on macroeconomic statistics)
- ▷ Assume that offshore wealth distributed like in HSBC and amnesties
- ▷ Apply rate of return on offshore wealth and use tax simulator to estimate evaded tax

The role of offshore tax evasion at the top in Scandinavia



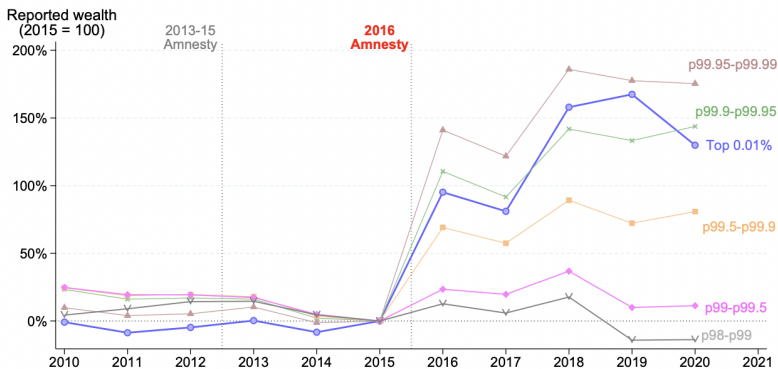
Offshore financial wealth is very concentrated: the case of the US

(b) Share Disclosing by Income Rank

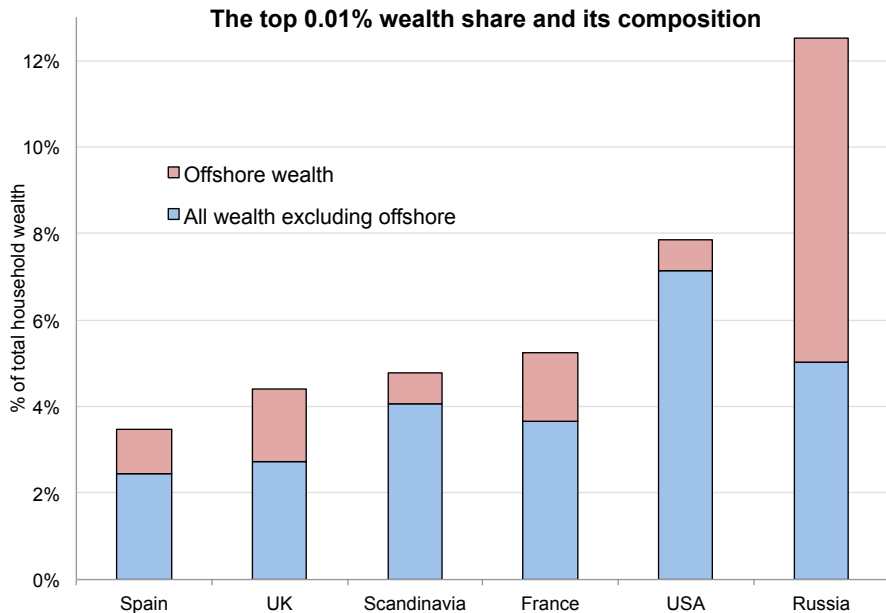


Offshore financial wealth is very concentrated: the case of Argentina

Figure 8: The increase in reported assets is greater for Argentina's wealthiest 0.1%



The weight of offshore wealth at the top



Why do People Evade?

Demand side models

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, $u(\cdot)$ concave

Allingham-Sandmo (1973)

- ▷ 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).

Limits of Allingham-Sandmo

Two main puzzles:

- ▷ Empirically, low audit rates ($p = .01$) and fines ($\theta \simeq .2$) \rightarrow with reasonable risk aversion, tax evasion should be generally higher than observed
- ▷ It should fall with income since audit rates rise with income

Solving the puzzles:

- ▷ Unable to cheat because of 3rd party reporting
- ▷ Supply of evasion services at the top

Kleven et al. (Econometrica 2011)

- ▷ Large stratified random sample (40,000 taxpayers audited)
- ▷ Very low rates of detected evasion: macro tax gap about 2.5% (no DCE in Denmark)
- ▷ 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

Third-party reporting swamps socio-economic factors

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%	

Third-party reporting swamps socio-economic factors

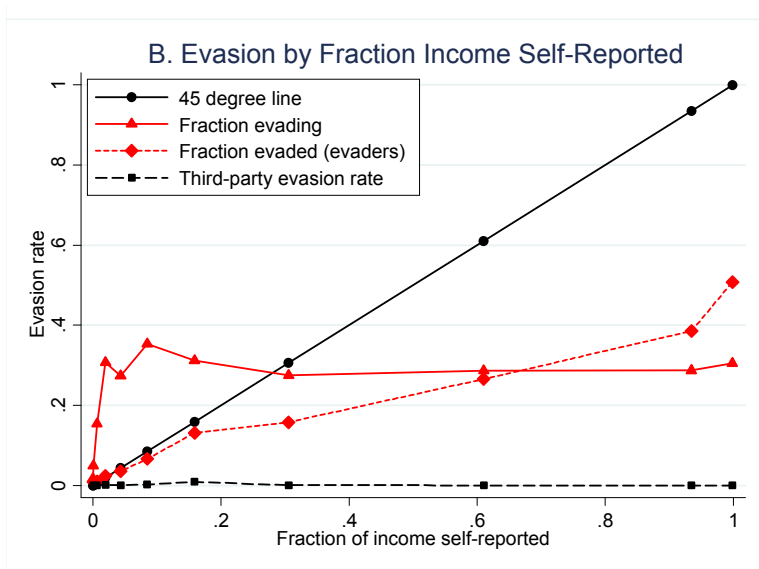
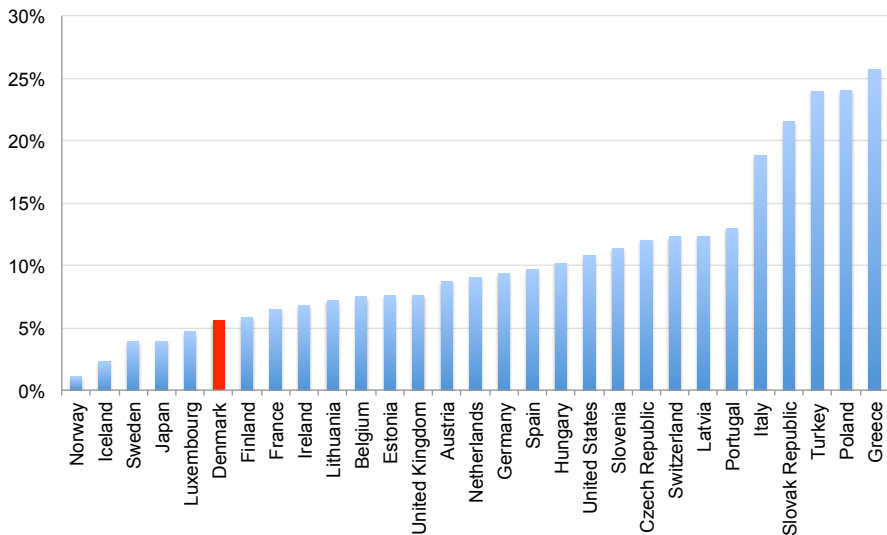


Figure 3. Anatomy of Tax Evasion

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

High-income countries have high share of third-party reported income

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



Explaining high evasion rates at the top: the role of the supply side

High evasion rates at top hard to understand in standard Allingham-Sandmo (1972) model (= demand side)

Alstadsæter et al. (2019): model of supply side. Setup:

- ▷ 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

Supply of evasion services (continued)

- ▷ Bank manages $k(s)$ in wealth when serves share $s = 1 - F(y)$ of the pop., 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

Supply of evasion services (continued)

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 population

Policies to curb tax evasion

Policy implications of the model:

- ▷ 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

The automatic exchange of bank information

Since 2017–18, offshore banks must automatically send reports to foreign countries' tax authorities.

- ▷ First US law (FATCA passed in 2010, started in 2015), then global standard (Common Reporting Standard, started in 2018)
- ▷ A landmark: from bank secrecy to bank transparency

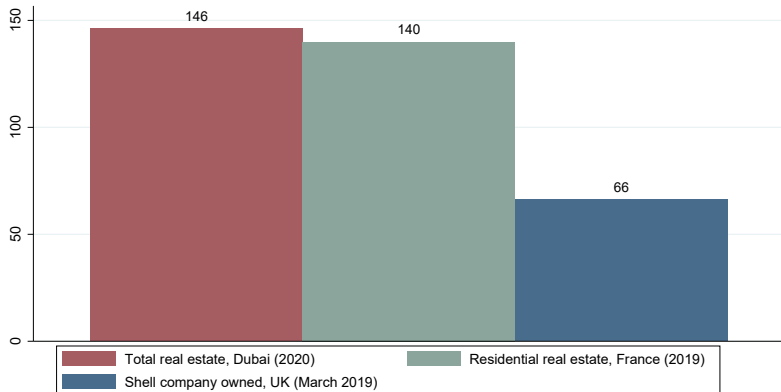
Limits of the automatic exchange of bank information

Main limits:

- ▷ Incentives of offshore financial institutions to truthfully cooperate
- ▷ Many developing countries still excluded
- ▷ Incomplete coverage: excludes real estate, a growing issue (Alstadsæter, Planterose, Zucman, and Økland, 2022)

Offshore real estate is large and growing: the case of Dubai

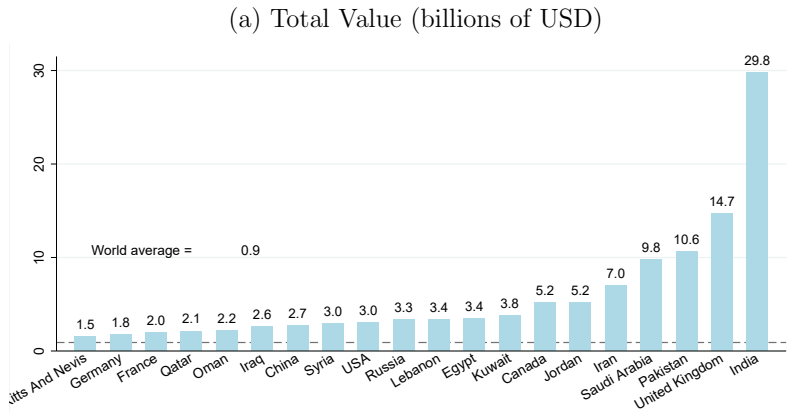
(a) Estimates of offshore real estate wealth



Who owns real estate in Dubai?

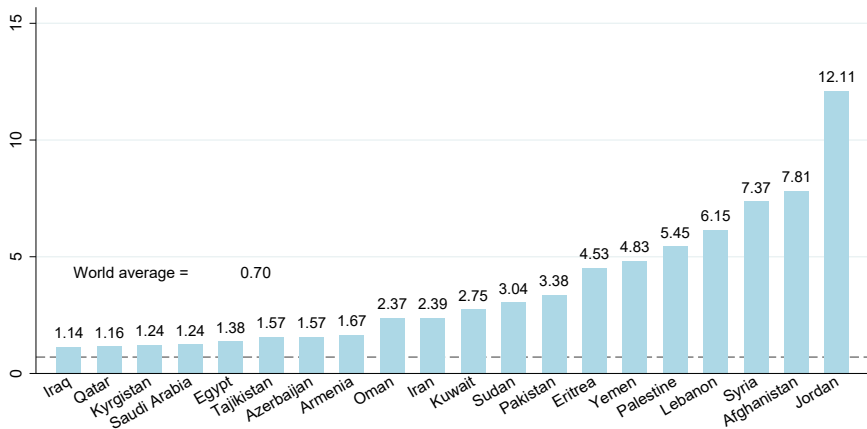
Proximity and historical ties matter

Figure 4: Real Estate Held in Dubai in 2020: Top 20 Countries



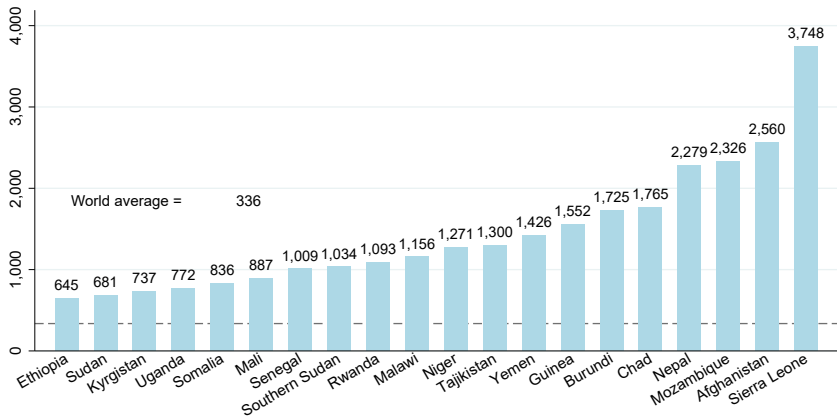
For some low-income countries, Dubai real estate = as much as 5%-10% of GDP

(a) Total Value (% of GDP)



Dubai properties are worth 1,000s \times the average income of home country's owners

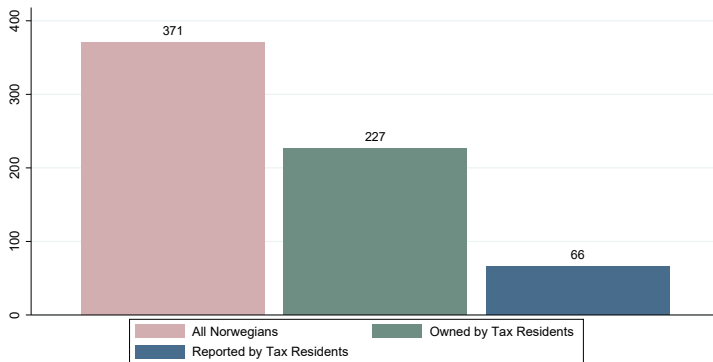
(b) Average Value (Multiples of GDP Per Capita)



About 70% of properties owned by Norwegians not reported for tax purposes

Figure 10: Reported vs. Total Dubai Real Estate of Norwegians

(a) Number of properties



Conclusion

Can capital be taxed?

Widespread view that capital taxation is doomed in a globalized world:

- ▷ Tax competition & avoidance mean “mobile” factors cannot be taxed much
- ▷ Standard economists’ view: use VAT and labor taxes, offset regressivity with progressive transfers

Limits of the conventional view

1. VAT + transfers means very low tax rates for the rich
→ dynamic effect on wealth inequality

2. Tax competition & evasion are not laws of nature, they are policy choices:

- ▷ Choices that were not very transparently or democratically debated but choices nonetheless
- ▷ Other choices are possible: current form of globalization is just one among many

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