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?
4. Effect of policies to curb tax evasion

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 $\rightarrow$ 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:

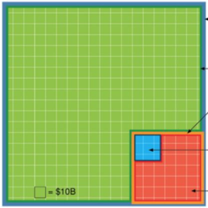
- ▷ Tax gap (= taxes evaded / taxes owed) around 16% in total
- ▷ No clear trend over time
- ▷ Tax gap concentrated among income items with no 3rd party reporting (such as self-employment income)
- ▷ Withholding reduces tax gap (liquidity constraint $\rightarrow$ some taxpayers can never pay taxes owed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

IRS tax gap studies

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 $1,398	Individual Income Tax $1,084	Individual Income Tax $31	+ Individual Income Tax $245	+ Individual Income Tax $38	= Individual Income Tax $314	− Individual Income Tax $43 (14%)	= Individual Income Tax $271
Corporation Income Tax $294	Corporation Income Tax $251	Corporation Income Tax #	+ Corporation Income Tax $37	+ Corporation Income Tax $5	= Corporation Income Tax $42	− Corporation Income Tax $10 (24%)	= Corporation Income Tax $32
Employment Tax $920	Employment Tax $839	Employment Tax [4] $6	+ Employment Tax $69	+ Employment Tax $6	= Employment Tax $81	− Employment Tax $5 (6%)	= Employment Tax $77
Estate Tax $16	Estate Tax $13	Estate Tax $2	+ Estate Tax $1	+ Estate Tax $<0.5	= Estate Tax $3	− Estate Tax $2 (55%)	= Estate Tax $1

Individual Income Tax underreporting:

Business Income	Non-Business Income	Credits	Income Offsets [1]	Filing Status	Other Taxes [2]	Unallocated Marginal Effects [3]
$110	$57	$42	$20	$5	$1	$10

Corporation Income Tax underreporting:

Large Corporations	Small Corporations
$26	$11

Employment Tax underreporting:

Self-Employment Tax	FICA & Uncollected FICA TAX	Unemployment
$45	$24	$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).

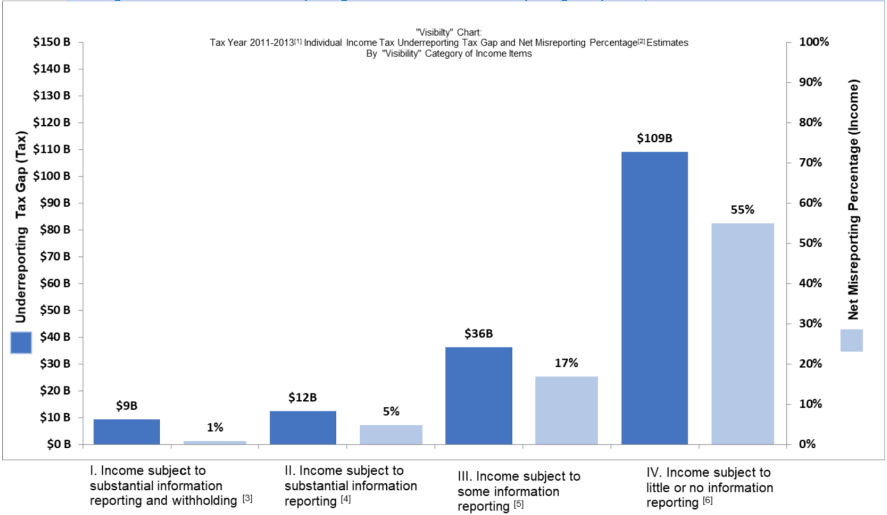
[3] Is the difference between (1) the estimate of the individual income tax underreporting tax gap where underreported tax is calculated based on all misreporting combined and (2) the estimate of the individual income tax underreporting tax gap based on the sum of the tax gaps associated with each line 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

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:

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

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

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 $Y_{1i} > 0$)

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

- ▷ 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:

- $\triangleright$ Intuition: some examiners find more evasion $\rightarrow$ if all examiners were like them, total evasion would be 3 $\times$ detected evasion
- $\triangleright$ But results sensitive to parametric assumptions (examiners not randomly assigned)
- $\triangleright$ 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

- $\triangleright$ Lack of resources in tax authorities
- $\triangleright$ Corporate/individual interface

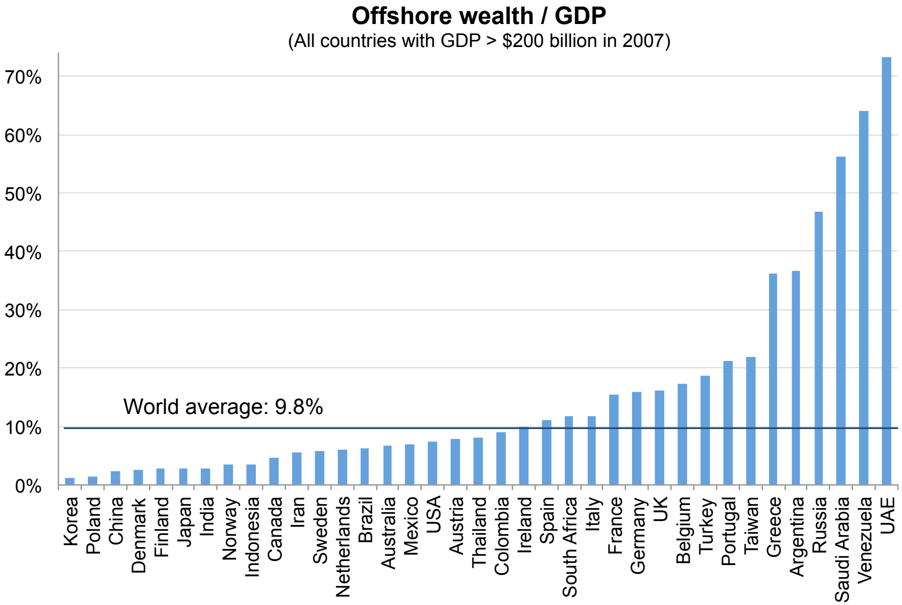
$\rightarrow$ Need to combine random audits with other sources

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)

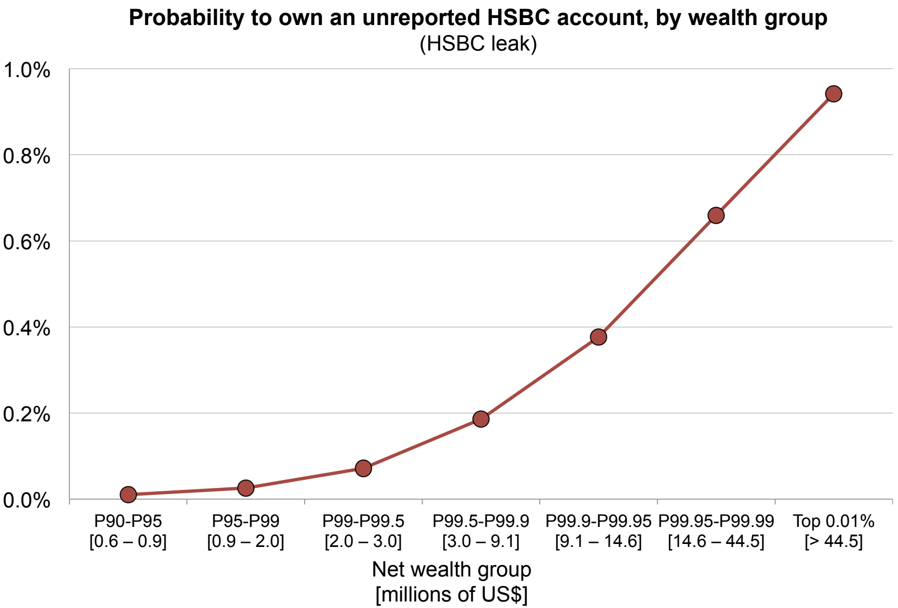
Financial wealth equivalent to 10% of world GDP is held in tax havens



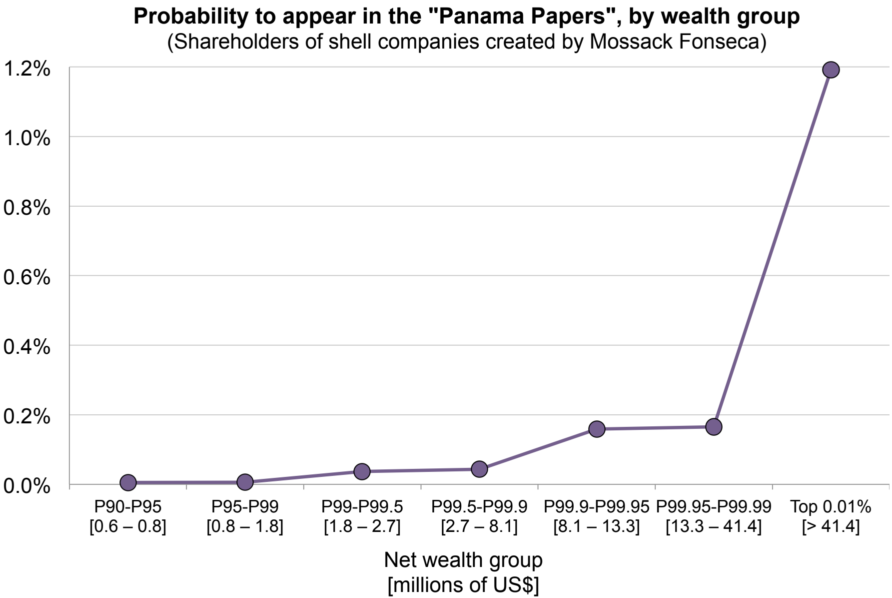
Alstadsæter et al. (2019)

- ▷ 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

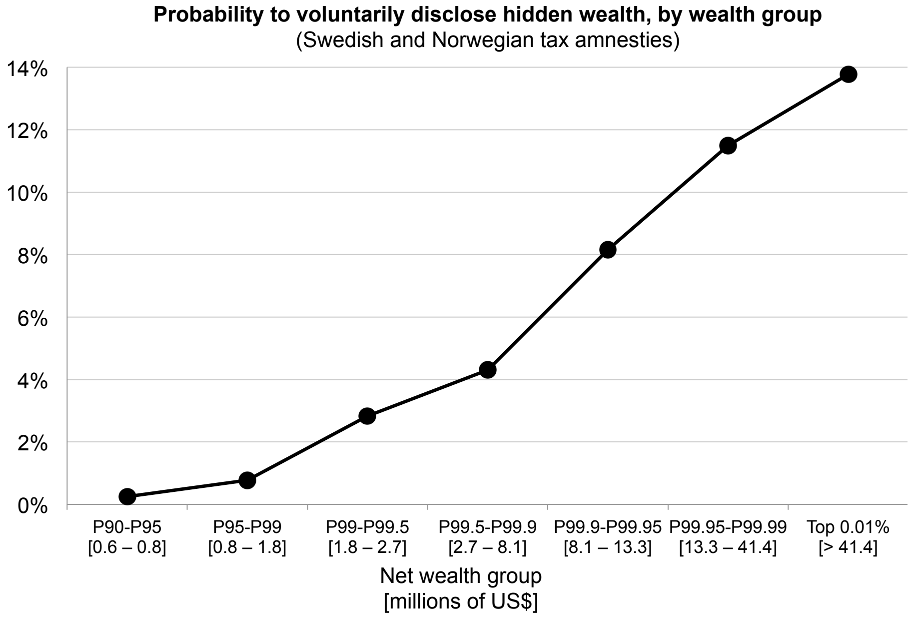
Probability to own hidden assets at HSBC Switzerland



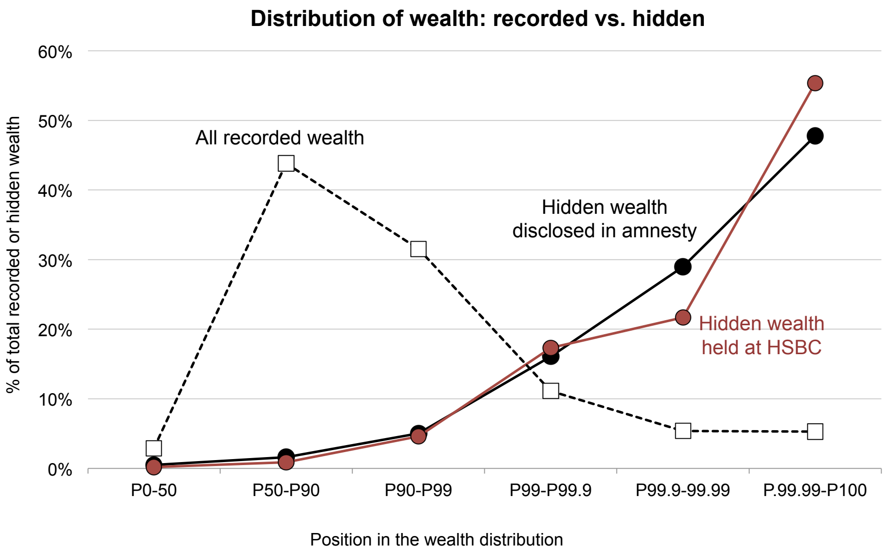
Probability to appear in the Panama Papers



Probability to disclose hidden assets in a tax amnesty in Scandinavia



Distribution of offshore assets

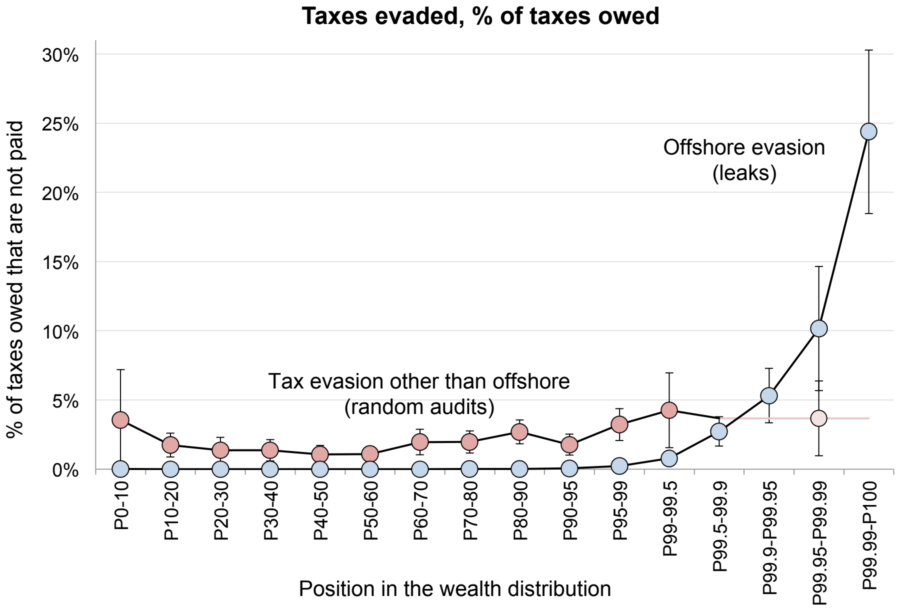


Distributional Tax Gaps

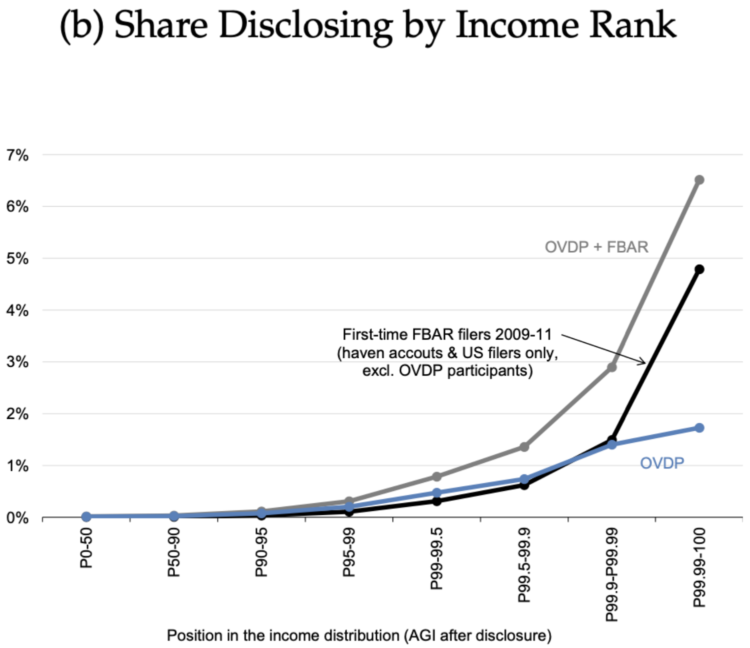
Idea: combine random audits and leaks to allocate total tax evasion across the income distribution.

- 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

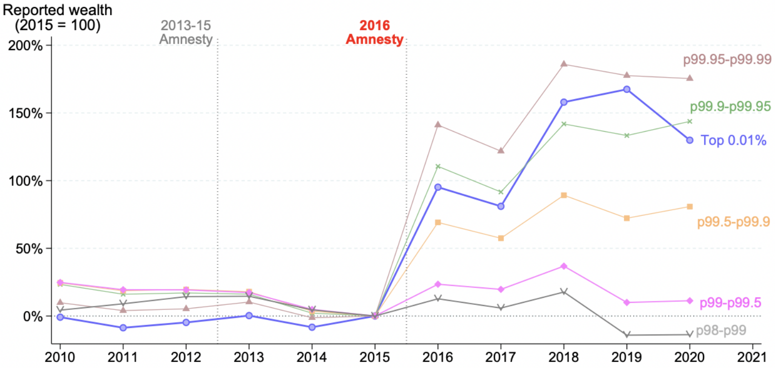


Offshore financial wealth is very concentrated: the case of the US

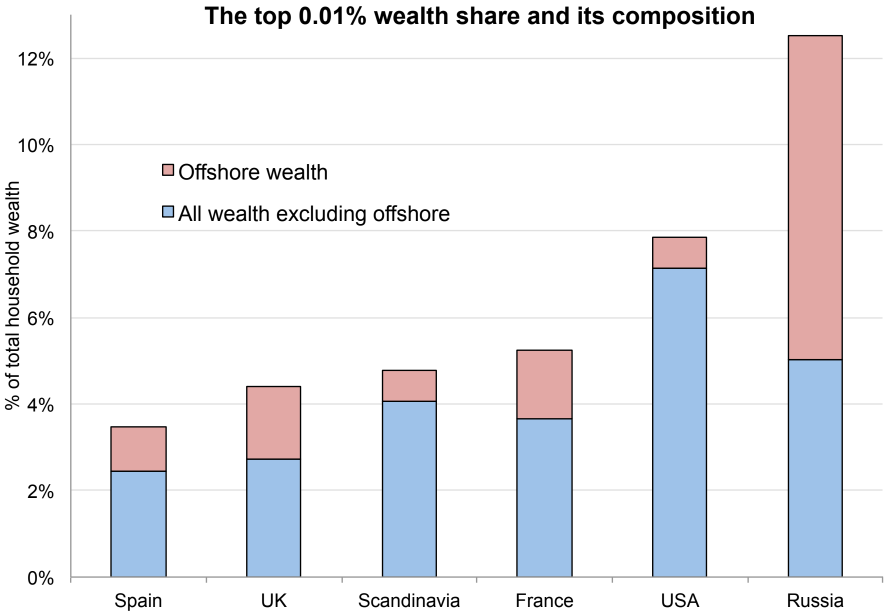


Offshore financial wealth is very concentrated: the case of Argentina

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, $u(.)$ 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. (Ecometrica 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%**	

Source: Kleven et al. (2010)

Third-party reporting swamps socio-economic factors

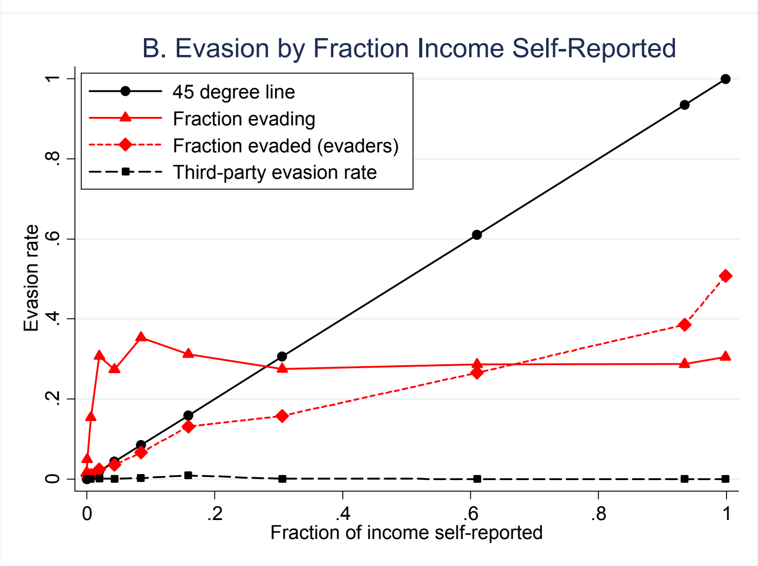
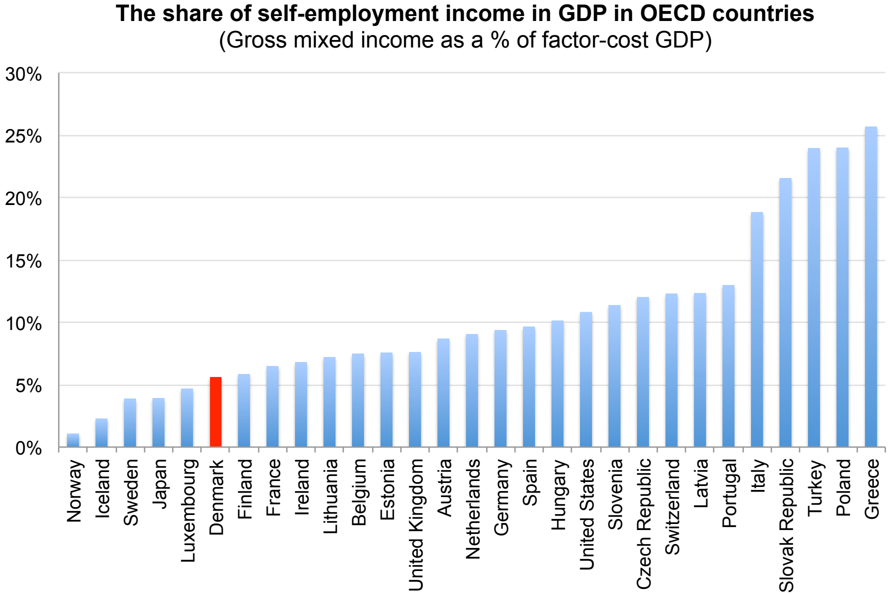


Figure 3. Anatomy of Tax Evasion

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

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



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

Effects of Policies

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
- ▷ Fast-growing literature on behavioral responses; first comprehensive analysis in Boas et al. (2024)

Boas et al. (2024)

Study the compliance effects of automatic information exchange (AEoI) in Denmark. Consider three channels:

- **repatriation** of foreign assets in anticipation of AEoI

- more **self-reporting** following onset of AEoI

- better **audits** through use of reports from foreign banks

Q: How much of the offshore tax gap has been closed by AEoI?

Channel #1: Repatriation

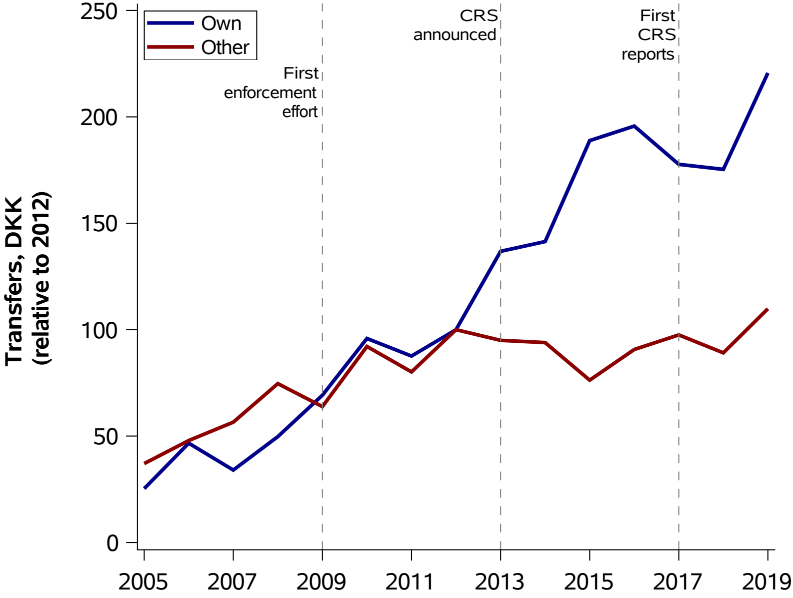
Automatic information exchange creates incentives for evaders to repatriate non-compliant assets

Challenging to study such repatriations because they leave no traces in the CRS reports or in foreign income fields on the tax return

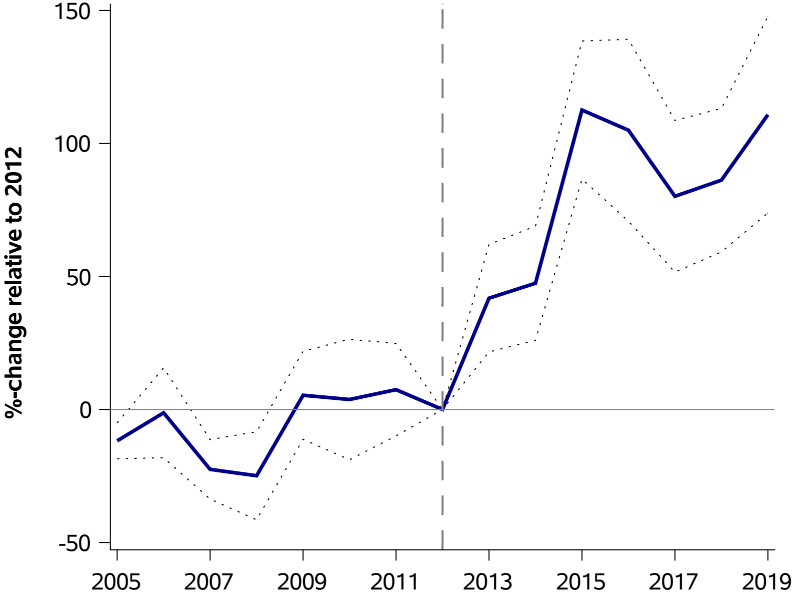
Boas et al. (2024) use data on cross-border money transfers from tax havens as a direct measure of repatriation

Get identification by comparing transfers from own vs other haven accounts

Strong differential increase in transfers from own accounts in 2013



Difference-in-difference

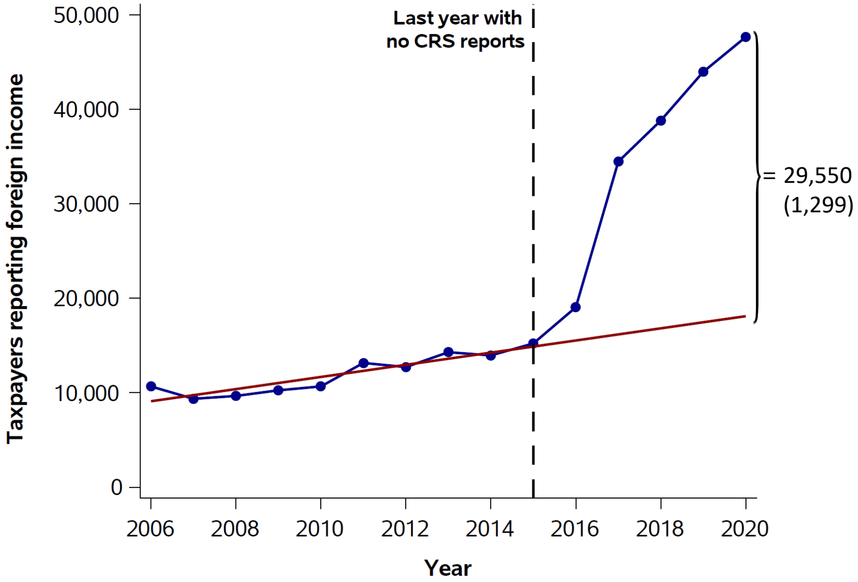


Channel #2: self-reporting of foreign income

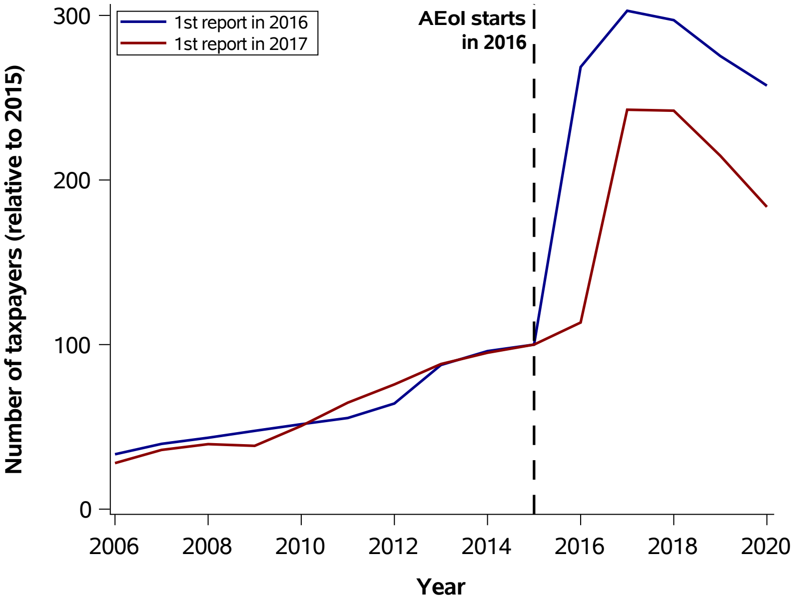
Taxpayers evading through foreign accounts may also become compliant by
- leaving assets on foreign accounts
- self-reporting the foreign capital income

Taxpayers may learn about the new AEoI regime
- foreign banks inform customers about their new reporting obligation
- domestic tax authorities share reports from foreign banks with taxpayers

Sharp increase in the number of taxpayers with self-reported foreign income



New compliance is driven by CRS reports



Channel #3: Better compliance through audits

How much can AEoI contribute to tax compliance through improved audits?

Compute **potential non-compliance** for each taxpayer by comparing bank-reported vs self-reported foreign dividend and interest income

Randomly select 500+ taxpayers with non-negligible potential non-compliance for targeted audit

Ask auditors to complete survey on each case to understand why actual corrections may be below potential corrections

Population-level results of audit analysis

Share of actually non-compliant (among those with potential non-compliance)
- Individuals: 78%
- Income: 51%

Why the discrepancy between actual and potential non-compliance:
- AEoI reports contain errors: 35%
- income is reported but not correctly: 14%

Boas et al. (2024): Gauging non-compliance by banks

Use money transfer data to identify taxpayers who likely hold foreign account (i.e. transfer from own account in year t and year t+1)

- AEoI report on **59%** of them ($-weighted)

Could reflect that banks do not send reports or that tax authorities fail to match reports

- match rate of **72%** ($-weighted)

Implied bank "non-compliance rate" of 18%.

[banks need to send reports for 82% of customers in order to achieve 59% with matched report given match rate of 72% (i.e. $0.59 = 0.72 \times 0.82$)]

Boas et al. (2024): AEoI reduces offshore evasion by 60-70%

	Wealth, billion DKK	Confidenace ineterval	% hidden wealth without CRS
A. Offshore wealth without CRS			
Offshore wealth in CRS	53.1		
Imperfect coverage of CRS	11.1	[9.3 ; 13.0]	
Repatriation due to CRS	10.5	[7.5 ; 13.6]	
Total	**74.8**		
B. Compliance without CRS (self-reporting)	**47.4**	[23.3 ; 71.5]	
C. Hidden wealth without CRS	**27.4**		**100%**
Memo: Alstadsæter et al. estimate, aged	27.2		
D. Increase in compliance due to CRS			
Repatriation from havens 2013-19	10.5	[7.5 ; 13.6]	38%
Self-reporting	6.0	[3.9 ; 8.1]	22%
Detectable noncompliance (audits)	3.6	[3.4 ; 3.8]	13%
Of which: actually detected	1.0		4%
Total	**20.1**		**73%**
E. Remaining noncompliance (residual)	**7.3**		**27%**

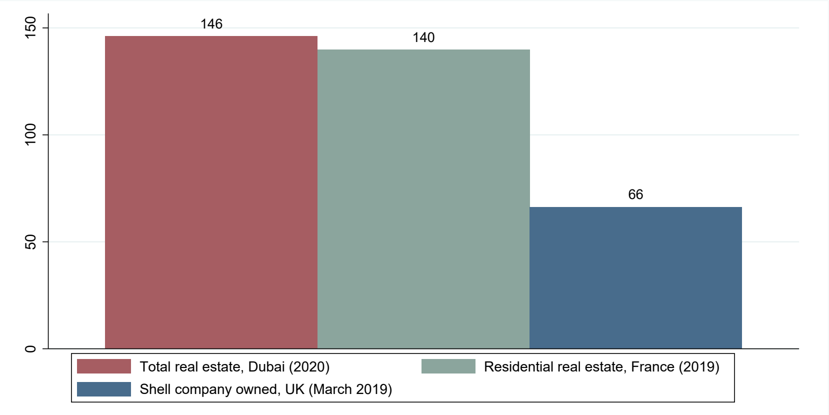
Limits of the automatic exchange of bank information

Main limits:

- ▷ Imperfect reporting by foreign banks
- ▷ Many developing countries still excluded
- ▷ Incomplete coverage: excludes real estate, a growing issue

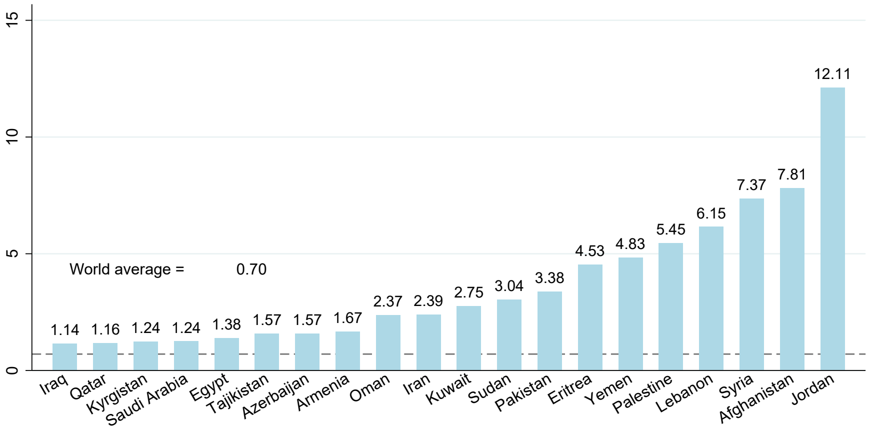
Offshore real estate: the case of Dubai (Alstadsæter et al., 2022)

(a) Estimates of offshore real estate wealth



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

(a) Total Value (% of GDP)



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
$\rightarrow$ dynamic effect on wealth inequality

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

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

References I

– Allingham, M. and A. Sandmo (1972), "Income tax evasion: a theoretical analysis", *Journal of Public Economics,* vol. 1, pp. 323-338. [pdf]

– Alstadsæter, A., N. Johannesen, and G. Zucman (2018), "Who Owns the Wealth in Tax Havens? Macro Evidence and Implications for Global Inequality". *Journal of Public Economics,* 162, pp. 89–100. [pdf]

* Alstadsæter, A., N. Johannesen, and G. Zucman (2019), "Tax Evasion and Inequality", *American Economic Review,* 109(6), pp. 2073–2103. [pdf]

– Alstadsæter A., B. Planterose, G. Zucman, and A. Økland (2022), "Who Owns Offshore Real Estate? Evidence from Dubai", EU Tax Observatory WP #1. [pdf]

* Boas. H., N. Johannesen, L. Larsen, K. Kreiner, and G. Zucman (2024), "Taxing Capital in a Globalized World: The Effects of Automatic Information Exchange", NBER working paper #32714. [pdf]

– Guyton, J., P. Langetieg, D. Reck, M. Risch, and G. Zucman (2021), "Tax Evasion at the Top of the Income Distribution: Theory and Evidence," NBER working paper #28542. [pdf]

References II

- Johannesen, N. and Zucman, G. (2014). "The End of Bank Secrecy? An Evaluation of the G20 Tax Haven Crackdown," *American Economic Journal: Economic Policy*, 6(1), pp. 65–91. [pdf]

- Leenders, W., A. Lejour, S. Rabate, and M. van't Riet (2023), "Offshore Tax Evasion and Wealth Inequality: Evidence from a Tax Amnesty in the Netherlands." *Journal of Public Economics*, 217: 104785. [pdf]

- Londoño-Vélez, J. and D. Tortarolo (2022), "Revealing 21% of GDP in Hidden Assets: Evidence from Argentina's Tax Amnesties" EU Tax Observatory working paper #6. [pdf]

- Zucman, G. (2013). "The Missing Wealth of Nations: are Europe and the US Net Debtors or Net Creditors?," *Quarterly Journal of Economics*, 128(3), pp. 1321–64. [pdf]

- Zucman, G. (2015), *The Hidden Wealth of Nations*, The University of Chicago Press.