Tax Enforcement

Economía Pública: Impuestos
Clase 5

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GOALS OF THIS LECTURE

1) Theoretically model tax enforcement, tax evasion, and avoidance in simple ways
    - Allingham-Sandmo JPUBE'72 model
    - Kleven et al ECMA'11 model

2) Study empirical evidence on tax avoidance and evasion and the effects of enforcement policies
    - Lab and Field Experiments
    - Tax Audit Experiment from Denmark
    - Various Sales Taxes
    - Offshore Tax Evasion

Tax Enforcement Problem

Most models of optimal taxation (income or commodity) assume enforcement issues away. In practice:

1) **Enforcement is costly** (eats up ~10% of taxes collected in the US) when combining costs for government (tax administration) and private agents (tax compliance costs)

2) **Substantial tax evasion** (15% of under-reported income in the US federal taxes). Tax evasion much worse in developing countries

Two widely used surveys:

- Andreoni, Erard, Feinstein JEL 1998
- Slemrod and Yitzhaki Handbook of PE, 2002

ALLINGHAM-SANDMO JPUBE'72 MODEL

Seminal theoretical tax evasion model (based on Becker's crime model)

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 audit probability, θ fine factor, $u(.)$ concave.

Let $c^{No\ Audit} = w-\tau\cdot\bar{w}$ and $c^{Audit} = w-\tau\cdot\bar{w}-\tau(w-\bar{w})(1+\theta)$

FOC in $\bar{w}$: $-\tau(1-p)u'(c^{No\ Audit}) + p\theta\tau u'(c^{Audit}) = 0 \Rightarrow$

$$\frac{u'(c^{Audit})}{u'(c^{No\ Audit})} = \frac{1-p}{p\theta}$$

SOC: $\Rightarrow \tau^2(1-p)u''(c^{No\ Audit}) + p\tau^2\theta^2 u''(c^{Audit}) < 0$

ALLINGHAM-SANDMO JPUBE'72 MODEL

Result: Evasion $w - \bar{w} \downarrow$ with p and θ

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

$$-dp \cdot \tau u'(c^{No\ Audit}) - d\bar{w} \cdot \tau^2 (1-p) u''(c^{No\ Audit}) =$$
$$dp \cdot \theta \tau u'(c^{Audit}) + d\bar{w} \cdot p\theta^2 \tau^2 u''(c^{Audit})$$

$$\Rightarrow d\bar{w} \cdot [-\tau^2 (1-p) u''(c^{No\ Audit}) - p\theta^2 \tau^2 u''(c^{Audit})] =$$
$$dp \cdot [\theta \tau u'(c^{Audit}) + \tau u'(c^{No\ Audit})]$$

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

Huge literature built from the **A-S** model
(including optimal auditing rules)

Why is tax evasion so low in OECD countries?

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

Two types of explanations for the puzzle:

1) **Unwilling to Cheat:** Social norms and morality [people dislike being dishonest and hence voluntarily pay taxes]

2) **Unable to Cheat:** Probability of being caught much higher than observed audit rate because of **3rd party reporting**:

Employers double report wages to earners and govt (W2 forms), companies and financial institutions double report capital income paid out to individuals and govt (US 1099 forms)

DETERMINANTS OF TAX EVASION

Large empirical literature studies tax evasion levels and the link between tax evasion and (a) tax rates, (b) penalties, (c) audit probabilities, (d) prior audit experiences, (e) socio-economic characteristics

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

(1) Evasion is difficult to measure

(2) Most independent variables [audits, penalties, etc.] are endogenous responses to evasion and also difficult to measure

$\Rightarrow$ Requires to use experimental data or to find good instruments:

(a) IRS National Research Program (NRP)
(b) Lab experiments
(c) Field experiments

TAX GAP: the UK

Tax gap: is the difference between the amount of tax that should be paid to HMRC in theory, and what is actually paid

- HMRC estimates the tax gap across all taxes and duties (Link)
- How? Using internal and external data and a range of different analytical techniques

The gap was 5.1% of taxes owed in 2020/21:

- Similar to the amount spent on central govt education
- Small businesses responsible for nearly half (~£15.6bn)
- VAT underpayments account for the 2nd biggest chunk (~£9bn)
- Gap is only 1% for tax due through **PAYE** (income is 'third-party reported' and also withheld at source)
- **Self-assessment** has more scope for non-compliance (self-reported and (partially) self-remitted)

TAX GAP: the United States

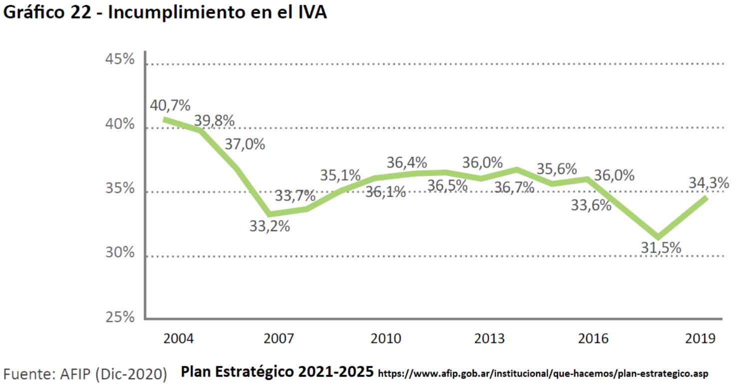
IRS carries out **random** audits to specifically estimate the tax gap

1) Total tax gap (= taxes evaded / taxes owed) around 14%

2) Tax gap concentrated among income items with no 3rd party reporting (such as self-employment income)

3) Withholding reduces tax gap (liquidity constraint $\Rightarrow$ some taxpayers can never pay taxes owed unless withheld at source)

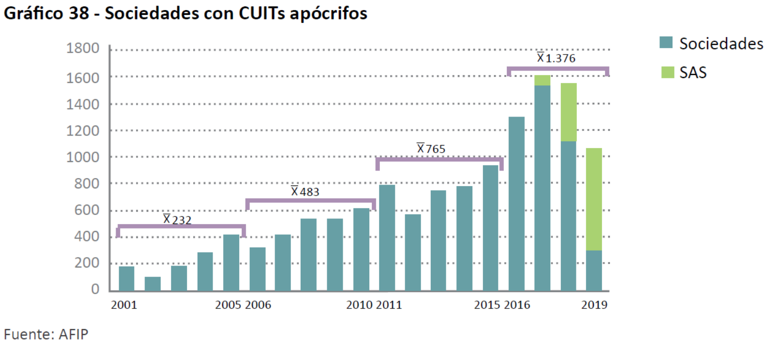
VAT non-compliance (gap) in Argentina



Plan Estratégico 2021-2025 https://www.afip.gob.ar/institucional/que-hacemos/plan-estrategico.asp

- La brecha de cumplimiento en el IVA ha sido históricamente significativa
- 34.3% de la recaudación potencial en 2019

Source of VAT non-compliance: crédito fiscal ficticio



- Maniobra de evasión más generalizada: uso de facturas apócrifas para aumentar (i) el crédito fiscal en las DDJJ de IVA, (ii) los gastos deducibles de Ganancias (reduce la base imponible)
- Sociedad por Acciones Simplificadas (SAS): medio mas usado para generar crédito fiscal ficticio (creada en 2017)

Tax Enforcement in the UK

Four broad ways in which tax compliance is achieved by HMRC:

1. **Direct reporting** (e.g., "fiscal tills" or POS equipment)
2. **Third-party reporting** (e.g., PAYE system)
3. **Behavioral interventions** (e.g., pre-filled forms)
4. **Audits** (more costly: require officers to handle each case)
   - Targeted at taxpayers believed to be non-compliant ('operational')
   - Randomised ('random enquiries')

The Dynamic Effects of Tax Audits

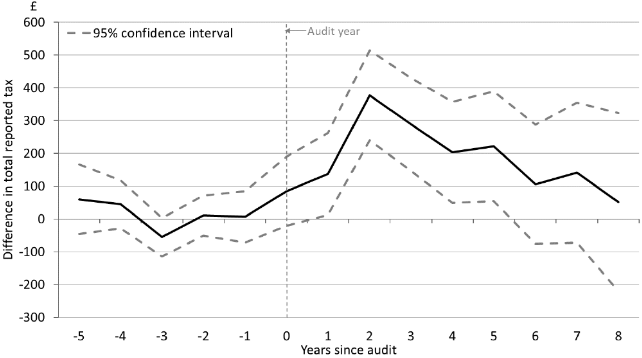
Advani, Elming, and Shaw (2021)

- Studies the effects of UK audits on long run compliance behaviour
- Combines two confidential admin databases:
  - The universe of UK tax filers over 13 years
  - A randomised audit program (+53k tax returns for 1999-2009)

    Note: people don't know they were randomly selected
- Finding: audits ↑ reported tax liabilities for 5 years after audit
- Longer lasting for more stable income (e.g., pensions vs dividends)
- Explanation: info revealed by audits constrains future misreporting

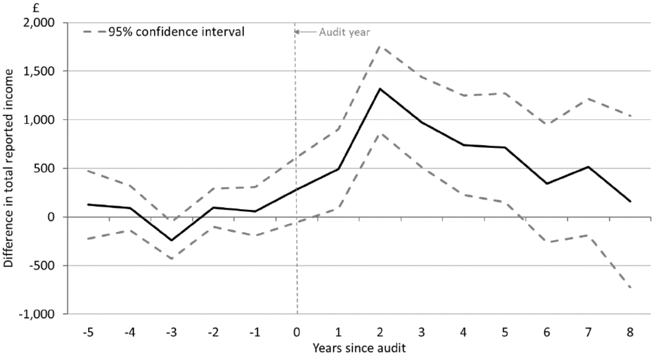
Contribution: recent focus on the value of audits purely as a threat...
this paper highlights a benefit of actually performing the audits

Figure 2: Dynamic effect of audits on total reported tax owed



Notes: *Sample includes individuals selected for a random audit between 1998/99 and 2008/09, and control individuals who could have been selected in the same years but were not. It uses tax returns from 1998/99 to 2011/12. The solid line plots the point estimate for the difference in average 'total*

Figure 3: Dynamic effect of audits on total reported income



Notes: *Sample includes individuals selected for a random audit between 1998/99 and 2008/09, and control individuals who could have been selected in the same years but were not. It uses tax returns from 1998/99 to 2011/12. The solid line plots the point estimate for the difference in average 'total*

LAB EXPERIMENTS

Multi-period reporting games involving participants (mostly students) who receive and report income, pay taxes, and face risks of being audited and penalized

1) Lab experiments have consistently shown that penalties, audit probabilities, and prior audits increase compliance (e.g., Alm, Jackson, and McKee, 1992)

2) But when penalties and audit probabilities are set at realistic levels, their deterrent effect is quite small [Alm, Jackson, and McKee 1992] $\Rightarrow$ Lab experiments tends to predict more evasion than observed in practice

Issues: Lab environment is artificial, and therefore likely to miss important aspects of the real-world reporting environment [3rd party information and social norms]

FIELD EXPERIMENTS

1) Blumenthal et al. NTJ'01 study the effects of normative appeals to comply: treatment group receives letter encouraging compliance on normative grounds "support valuable services" or "join the compliant majority", control group [no letter]

⇒ No (statistically significant) effect of normative appeals on compliance overall

2) Slemrod et al. JPubE'01 study the effects of "threat-of-audit" letters

⇒ Statistically significant effect on reported income increase, especially among the self-employed ["high opportunity group"] but very small sample size

Recently: (a) Hallsworth et al. '17 show that normative appeals help in collecting overdue taxes [but small quantitatively], (b) Bott et al. 2020 for a randomized experiment in Norway on foreign income [threat of audit more effective than normative appeal], (c) see survey Luttmer-Singhal '14

Either Letter						
	Federal Taxable Income			MN Tax Liability		
	Treated	Control	Treated–Control	Treated	Control	Treated–Control
1994	$26,927	$26,940	$–14	$1,946	$1,954	$–8
1993	$26,346	$26,449	$–103	$1,919	$1,934	$–15
1994–1993	$580	$491	$89(270)	$27	$20	$7(22)
% with 94–93 increase	54.3	53.9	0.4	52.8	52.3	0.5
n	31,149	15,624		31,149	15,624	

Notes:
Number in parentheses is the standard error.
The mean of "Treated–Control" may differ from the mean of "Treated" minus the mean of "Control" due to rounding error.

Source: Blumenthal et al. (2001), p. 131

Table 4
Average reported federal taxable income: differences in differences for the whole samp

Whole sample (weighted)

	Treatment	Control	Difference
1994	23,781	23,202	579
1993	23,342	22,484	858
94 − 93	439	717	−278
S.E.			464
%w/increase	54.4%	51.9%	2.5%***
n	1537	20,831	

Low income

	High opportunity		
	Treatment	Control	Difference
1994	7473	3992	3481
1993	971	787	183
94 − 93	6502	3204	3298
S.E.			2718
%w/increase	65.4%	51.2%	14.2%*
n	52	123	

Source: Slemrod et al. (2001), p.466

Tax Audit Experiment from Denmark

Kleven-Knudsen-Kreiner-Pedersen-Saez (2011)

Study Danish income tax auditing experiment [stratified sample 40,000]

Overall detected evasion [no adjustment] is around 2.5% but:

1) Evasion rate for self-reported items is almost 40%
2) Evasion rate for third-party reported items is only 0.3%
3) Overall evasion rate is so low because 95% of income is third-party reported in Denmark (*unable* to cheat rather than *unwilling* to cheat)

Role of 3rd party reports [information structure] seem to trump social factors and economic factors.

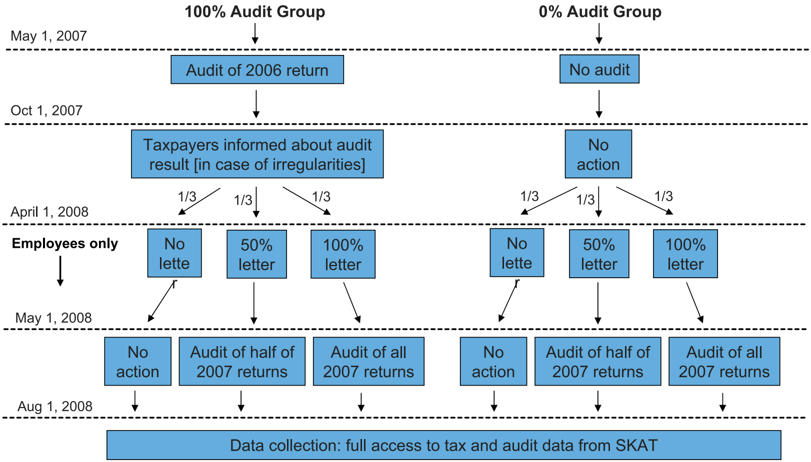
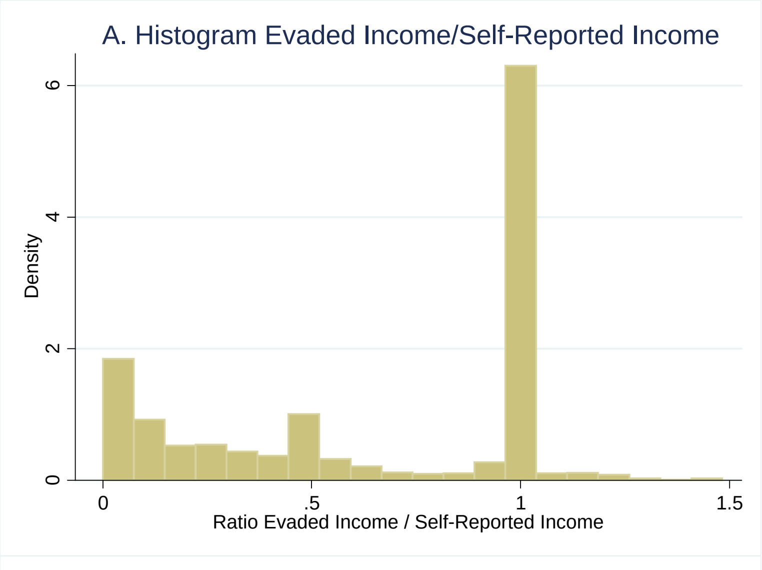


FIGURE 2.—Overview of experimental design.


A. Histogram Evaded Income/Self-Reported Income
Density
0
2
4
6
0
.5
1
1.5
Ratio Evaded Income / Self-Reported Income

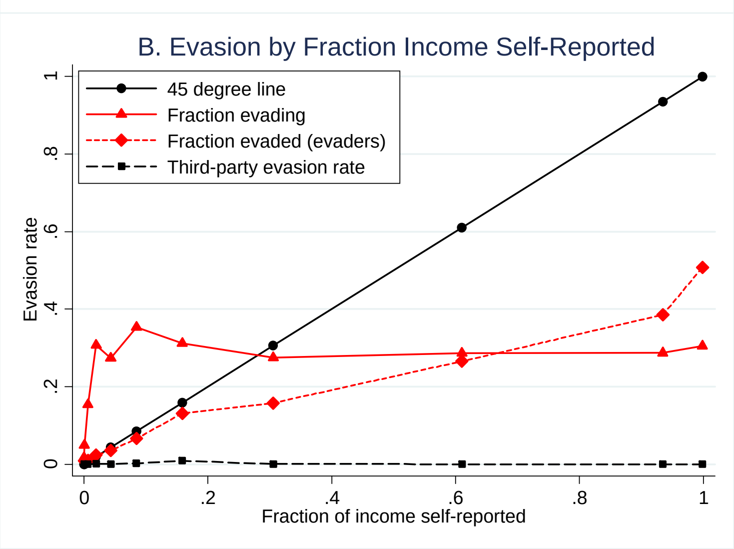


Figure 3. Anatomy of Tax Evasion

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

- Large spike at 1: among evaders, the most common strategy is to evade all self-reported income
- Panel B: the prob of evading ↑ immediately once the taxpayer has some income that is self-reported
- The % of income evaded is increasing in the share of self-reported income, whereas the % of third-party income evaded is always ~0 ⇒ taxpayers with more self-reported income evade more, but always declare third-party income fully
- The % of total income evaded is very close to the 45-degree line as long as self-reported income is <20% of total income, and then starts to fall below the 45-degree line

Tax Audit Experiment from Denmark

Kleven et al. '11 also provide experimental causal effects of:

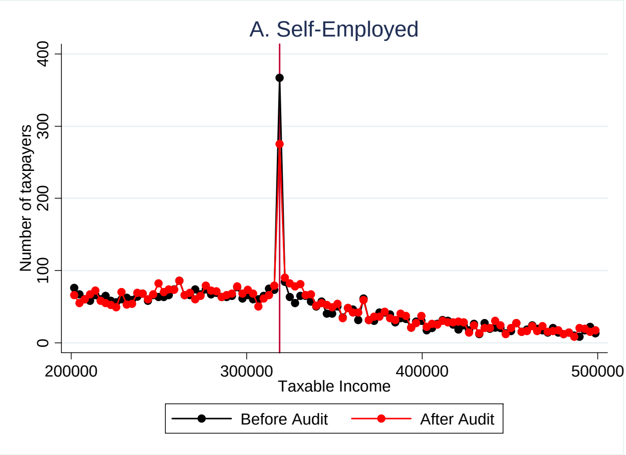
1) Marginal tax rates: use bunching evidence before and after audit: Most bunching not due to evasion but avoidance ⇒ Effect of MTR on evasion is modest

2) Prior-audit effects: compare next year outcomes of 100% audit group and a 0% audit group [as audited tax filers may update upward beliefs on p]

⇒ Find significant effects on reported income increases, concentrated among self-reported items [nothing on 3rd party income]: Extra tax collected through this indirect effect is about 50% of extra taxes collected due to base year audits

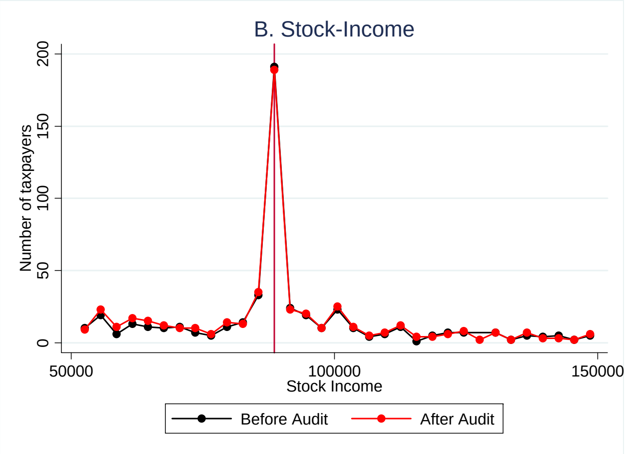
3) Threat-of-audit letters: Find significant effects on self-reported income increases [as in Slemrod et al.] and letter prob matters

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)

Effect of Audits on Subsequent Reporting

Amount of income change from 2006 to 2007

	Baseline audit adjustment amount	Difference: 100% vs. 0% audit group		
	Total income	**Total income**	**Self-reported income**	**Third-party income**
Net income	**5629**	**2554**	**2322**	232
	(497)	(787)	(658)	(691)
Total tax	**2510**	**1377**		
	(165)	(464)		

Source: Kleven et al. (2010)

Effect of Audit Threats on Subsequent Reporting

Probability of upward adjustment in reported income (in percent)

	Both 0% and 100% audit groups		
	Letter – No Letter	**50% Letter – No Letter**	**100% Letter – 50% Letter**
Net income	**1.51**	**1.04**	**0.95**
	(0.28)	(0.33)	(0.33)
Total tax	**1.54**	**0.99**	**1.10**
	(0.28)	(0.33)	(0.33)

Source: Kleven et al. (2010)

EXPLAINING ACTUAL TAX POLICIES

Income $w = w_t + w_s$ where w_t is third-party reported (observed by govt at no cost) and w_s is self-reported (as in standard A-S model). Individuals report $\bar{w}_t$ and $\bar{w}_s$

Incorporating 3rd-party reporting solves puzzles of the **A-S** model:

1) Evasion rates are high in s sector (consistent with **A-S**) and low in t sector
2) IRS sets audit rate p higher when $\bar{w}_s < 0$ (small business losses, undocumented deductions, etc.) to protect w_t base
3) $\bar{w}_s$ losses not allowed against w_t (example: US limits capital gain losses and passive business losses)
4) Use of schedular income taxes (tax separately various bases): Earliest income taxes (1800-1900) are **schedular**

SIMPLER MODEL OF TAX EVASION

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

$$du/d\bar{w} = 0 \Rightarrow [p(\bar{w}) - p'(\bar{w})(w - \bar{w})](1 + \theta) = 1$$

Introduce the elasticity of the detection probability with respect to undeclared income: $\varepsilon = -(w - \bar{w})p'(\bar{w})/p(\bar{w}) > 0$. Then,

$$p(\bar{w}) \cdot (1 + \theta) \cdot (1 + \varepsilon) = 1$$

Mg cost of evading \$1 extra (LHS) vs Mg benefit of evading \$1 extra (RHS)

- If $\varepsilon = 0$, then always evade if $p \cdot (1 + \theta) < 1$
- If $\varepsilon > 0$, then evading more increases risk of being caught on all infra-marginal evaded taxes $\Rightarrow$ Even with $\theta = 0$, full evasion is not always optimal

Shape of $p(\bar{w})$ depends crucially on 3rd party income

Source: Kleven et al (2011)

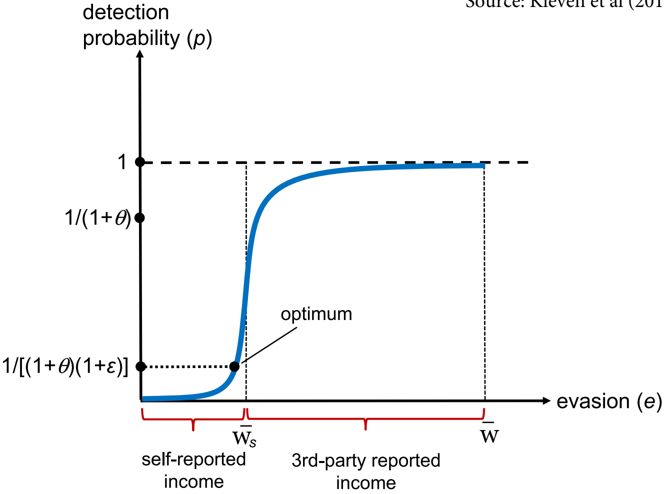


FIGURE 1.——Probability of detection under third-party reporting.

Intuition for the S-shaped detection probability:

- For self-reported income, the detection probability is very low because there is no smoking gun for tax evasion and tax admin have limited resources to carry out blind audits
- For 3rd-party reported income (and no collusion), the probability of detection is close to 1 as systematic matching of tax returns and information reports will uncover any evasion
- As tax evasion goes from 0 to $\bar{w}$, the taxpayer first evades taxes on income items with a low detection probability and then on items with a high detection probability
- At the optimum, taxpayers almost fully underdeclare self-reported income, while fully declaring 3rd-party reported income

WHY DOES THIRD PARTY REPORTING WORK?

In theory, employer and employee could collude to evade taxes ⇒ third-party does not help (Yaniv 1992)

In practice, such collusion is fragile in modern businesses bc:

1) Accounting and payroll records that are widely used within the firm [records need to report true wages in order to be useful to run a complex business]
2) A single employee can denounce collusion between employer and employees. Likely to happen in a large business [disgruntled or new employee, whistle blower seeking govt reward]

⇒ Taxes can be enforced even with low penalties and low audit rates [Kleven-Kreiner-Saez 2016, Jensen 2022]

Caveat: partial tax evasion with fraction of wage in cash is prevalent in middle income countries (Feinmann-Lauletta-Rocha '22)

VARIOUS SALES TAXES

Turnover taxes used to tax all sales: business to consumer (B-C) and business to business (B-B):

Creates multiple layers of taxes along a production chain ⇒ Higher total tax when B-B-C than B-C

Retail Sales Tax is imposed on B-C sales only [B-B exempt]: difficult to distinguish B-B and B-C (shifting), strong evasion incentive for B-C [sales tax does not work well with small retailers]

Value-Added-Tax (VAT) taxes only value added [sales minus purchases] in all transactions (B-B and B-C): equivalent to retail sales economically but easier to enforce [automatic upstream enforcement]

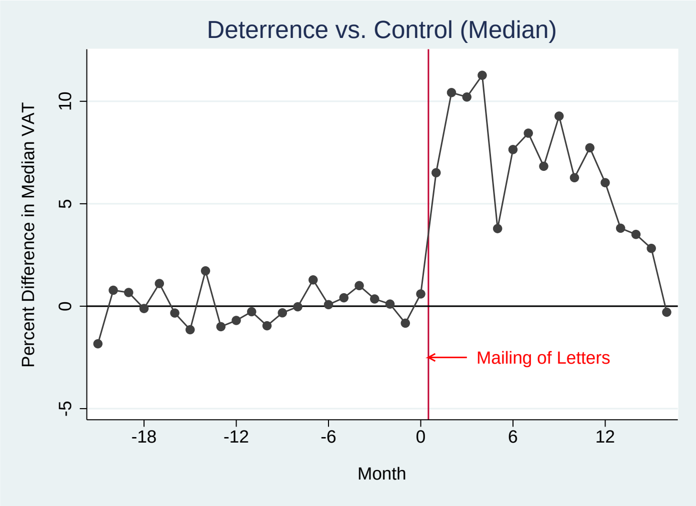
VAT first introduced in France in 1950s, has spread to most countries [US only rich country without VAT]

Pomeranz AER'15 VAT Experiment

Randomized experiment with 445,000 firms in Chile: sent threat of VAT audit letters to sub-sample of businesses

Key Results:

1) Significant effect of letters on VAT collection (+10% over 12 months)
2) Smaller impact on reported transactions that already have a paper trail (intermediate sales) than on those which don't (final sales)
3) Effect of random audit announcement is transmitted up the VAT chain, increasing compliance by firms' suppliers



Source: Pomeranz AER'14

Panel A

Table 4: Letter Message Experiment: Intent-to-Treat Effects on VAT Payments by Type of Letter

	(1) Mean VAT	(2) Median VAT	(3) Percent VAT > Previous Year	(4) Percent VAT > Predicted	(5) Percent VAT > Zero
Deterrence letter X post	-1,114	1,326***	1.40***	1.42***	0.53***
	(2,804)	(316)	(0.12)	(0.10)	(0.09)
Tax morale letter X post	-1,840	262	0.40	0.30	0.44**
	(6,082)	(666)	(0.25)	(0.22)	(0.20)
Placebo letter X post	835	383	-0.11	-0.19	-0.14
	(6,243)	(687)	(0.26)	(0.23)	(0.20)
Constant	268,810***	17,518***	47.50***	48.27***	67.30***
	(1,799)	(112)	(0.07)	(0.07)	(0.06)
Month fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	No	Yes	Yes	Yes
Treatment Assignment	No	Yes	No	No	No
Number of observations	7,892,076	1,221,828	7,892,076	7,892,076	7,892,076
Number of firms	445,734	445,734	445,734	445,734	445,734
Adjusted R^2	0.40		0.14	0.28	0.47

Notes: Column (1) shows a regression of the mean declared VAT on treatment dummies, winsorized at the top and bottom 0.1% to deal with extreme outliers. Column (2) shows a median regression of average VAT before treatment and in 4 months after each treatment wave. Columns (3)-(5) show linear probability regressions of the probability of an increase in declared VAT compared to the same month in the previous year, the probability of declaring more than predicted and the probability of declaring any positive amount. Observations are monthly in Columns (1) and (3)-(5) for ten months prior to treatment and four months after each wave of mailing. The four months after the second wave excludes firms treated in the first. Coefficients and standard errors of the linear probability regressions are multiplied by 100 to express effects in percent. Monetary amounts are in Chilean pesos, with 500 Chilean pesos approximately equivalent to 1 USD. Standard errors in parentheses, robust and clustered at the firm level for Columns (1) and (3)-(5). *** p<0.01, ** p<0.05, * p<0.1.

Source: Pomeranz AER'15

Table 5: Impact of Deterrence Letter on Different Types of Transactions

	(1) Percent Sales > Previous Year	(2) Percent Input Costs > Previous Year	(3) Percent Intermediary Sales > Previous Year	(4) Percent Final Sales > Previous Year
Deterrence letter X post	1.17***	0.16	0.12	1.33***
	(0.22)	(0.21)	(0.19)	(0.21)
Constant	55.39***	53.25***	38.37***	45.04***
	(0.13)	(0.13)	(0.12)	(0.12)
Month fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Number of observations	2,392,529	2,392,529	2,392,529	2,392,529
Number of firms	133,156	133,156	133,156	133,156
Adjusted R^2	0.25	0.22	0.30	0.32

Notes: Regressions of the probability of the line item (total sales, total input costs, intermediary sales, and final sales) being higher than in the same month the previous year. Sample of firms that have both final and intermediary sales in the year prior to treatment. The four months after the second wave excludes firms treated in the first wave. Coefficients and standard errors are multiplied by 100 to express effects in percent. Robust standard errors in parentheses, clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1.

Source: Pomeranz AER'15

Table 7: Spillover Effects on Trading Partners' VAT Payments

	(1) Percent VAT > Previous Year	(2) Percent VAT > Predicted	(3) Percent VAT > Previous Year	(4) Percent VAT > Predicted	(5) Percent VAT > Previous Year	(6) Percent VAT > Predicted
Audit announcement X post	2.41**	2.03*				
	(1.14)	(1.11)				
Audit announcement X supplier X post			4.28***	3.92***	4.14***	3.83***
			(1.54)	(1.50)	(1.52)	(1.52)
Audit announcement X client X post			-0.26	-0.28	-0.14	-0.28
			(1.64)	(1.51)	(1.67)	(1.55)
Supplier X post			-0.64	0.34	-1.11	0.60
			(1.62)	(1.59)	(1.67)	(1.64)
Constant	52.07***	49.06***	52.07***	49.06***	52.75***	50.11***
	(0.95)	(0.94)	(0.95)	(0.94)	(0.96)	(0.96)
Controls X post	No	No	No	No	Yes	Yes
Controls X audit announcement X post	No	No	No	No	Yes	Yes
Month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	45,264	45,264	45,264	45,264	44,288	44,288
Number of firms	2,829	2,829	2,829	2,829	2,768	2,768
Adjusted R^2	0.05	0.11	0.05	0.11	0.05	0.10

Notes: Regressions for trading partners of audited firms. Column (1), (3) and (5) shows the probability of an increase in declared VAT since the previous year, Column (2), (4) and (6) shows the probability of declaring more than predicted. The controls in Columns (5) and (6) are firm sales, sales/input-ratio, share of sales going to final consumers, and industry categorized as "hard-to-monitor." Observations are monthly for ten months prior to treatment and six months after the audit announcements were mailed. Coefficients and standard errors are multiplied by 100 to express effects in percent. Robust standard errors in parentheses, clustered at the level of the audited firm. *** p<0.01, ** p<0.05, * p<0.1.

Source: Pomeranz AER'15

Naritomi AER'19: Consumers as Tax Auditors

Studies an anti-tax evasion program in São Paulo, Brazil (Nota Fiscal Paulista) that created monetary rewards for consumers to ensure that firms report final sales transactions

- The program provides tax rebates and monthly lottery prizes for consumers who ask for receipts
- Establishes an online account system: consumers can verify receipts reported by firms and act as whistle-blowers by filing complaints
- Designed to address the "last mile" problem of the self-enforcing mechanism of the VAT
- Result: reported sales in retail increased by 21% over 4 years, but firms also report more expenses. On net, however, tax revenue net of rewards increased by 9.3%

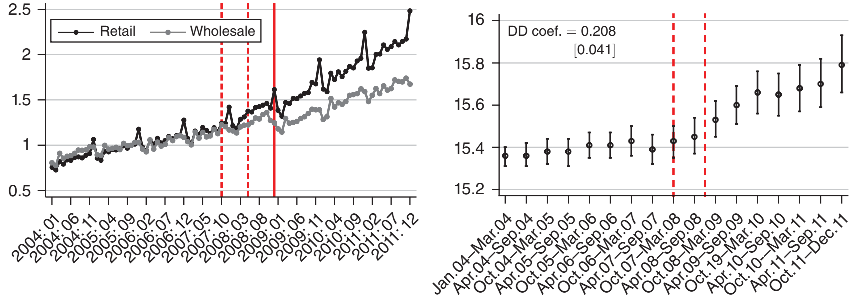


FIGURE 2. EFFECT OF THE POLICY ON REPORTED REVENUE: RETAIL VERSUS WHOLESALE

Notes: Panel A shows reported revenue changes for retail and wholesale sectors. Each line is the revenue reported by all firms aggregated by retail or wholesale scaled by the average monthly reported revenue before October 2007 for each sector group. The figure plots the raw data. The are spikes around December of each year follows the seasonal variation in consumption. The vertical lines highlight the key dates for the implementation of the NFP program: phase-in of sectors begins in October 2007 and ends in May 2008, and the first lottery based on the purchases with SSN receipts was introduced in December 2008. Panel B plots regression coefficients from estimating spec-

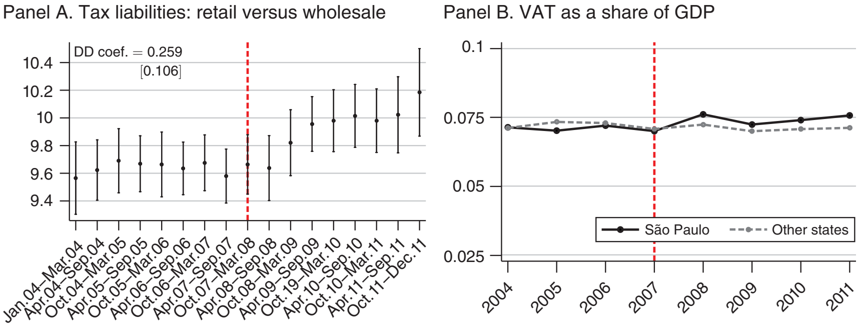


Figure 6. Effect of the Policy on Tax Revenue

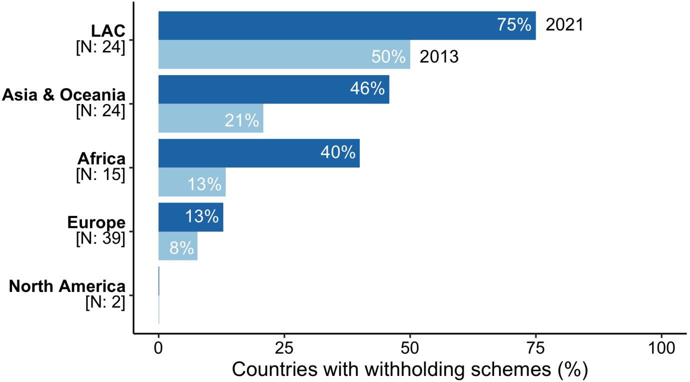
Notes: Panel A plots regression coefficients from estimating specification (5) using log of tax liabilities as the dependent and a sample of sectors for which total tax due best approximates the tax liability of firms between January 2004 and December 2011 (see online Appendix B for more detail). Similarly, the difference-in-differences (DD) coefficient displayed in the figure is estimated using log of tax liabilities as the dependent variable in specification (6). The DD variable is defined by the interaction between a dummy for retail sectors and a dummy that equals 1 for time periods after October 2007. This sector sample has 5,088 observations and standard errors are clustered by sector. Online Appendix Figure A4 shows the effect of the policy on reported revenue using the same tax sample. Panel B shows total VAT revenue in São Paulo as a share of the state's GDP comparing with total VAT collected in Brazil as a share of the total GDP in Brazil using data from the Brazilian Central Bank. The figures

Firms as Tax Collectors

Garriga and Tortarolo (2022)

- Govts in devo countries struggle to raise revenue / build capacity
  - ↑ taxes and/or ↓ non-compliance are standard tools
  - Yet achieving large-scale capacity requires fundamental transformations
  - Recent evidence of dramatic returns to improving tax administration [Basri et al, 2021]
- **Withholding systems** can help ease admin burden
  - Tax collection device where 3rd parties (large firms) collect/remit taxes on behalf of related parties (employees, firms)
  - Withholding of **personal income tax** is widespread [Besley and Persson, 2014]
  - Withholding of **indirect taxes** (VAT, sales, turnover) is increasingly used in developing countries, but remains largely understudied [Waseem, 2022; Brockmeyer & Hernandez, 2019]

Withholding of indirect taxes has surged in many regions over the last years



Source: Own Text analysis on EY's '*Worldwide VAT, GST and Sales Tax Guide*'

Garriga and Tortarolo (2022)

What are the implications of delegating tax collection duties to firms?

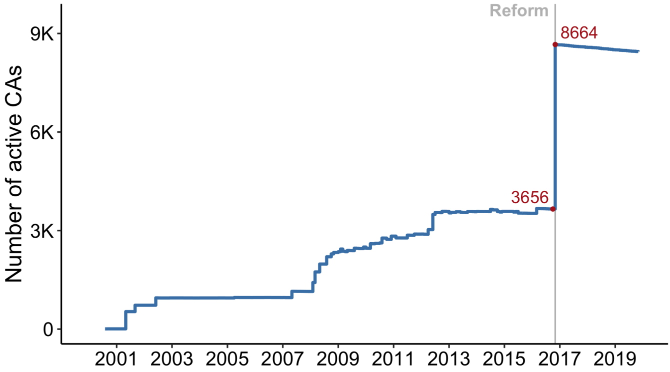
1. Does tax withholding have an impact on aggregate revenue? YES
2. Are withholding agents affected by this task? NO
3. **How do firms respond when their commercial partners withhold taxes from them?**

What we do:

- Exploit Δ in **turnover tax** collection in the City of Buenos Aires
- Combine rich **admin tax data + 2 reforms** to withholding system
  $\rightarrow$ Changed how the tax was collected, holding all else constant

Reform 1: The net of tax collectors (CAs) doubled in size

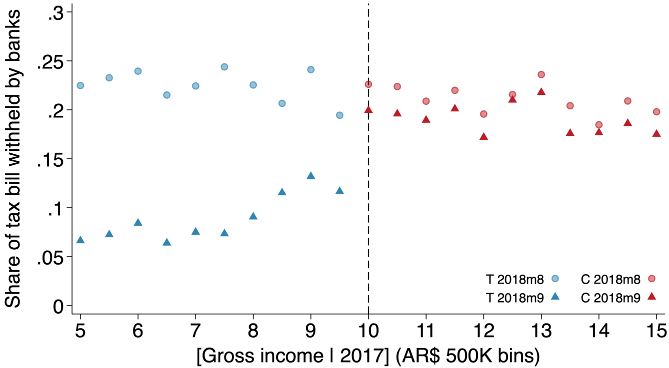
Nov 2016: firms appointed as CA if 2015 sales > AR\$60M (~97th ptile)



Implication → more tax collected at source by CAs *in lieu* of direct payments

Reform 2: Bank withholding fully waived for SMEs firms

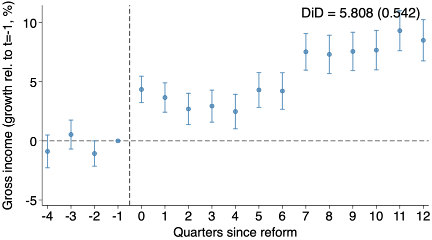
Sep 2018: withholding by banks waived if 2017 sales < AR$10M (~80th ptile)



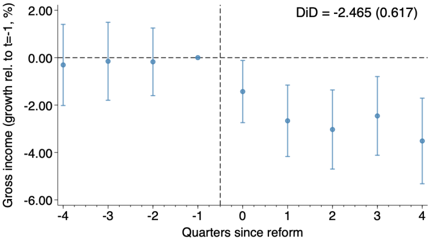
Implication → decrease in tax withheld by banks for SMEs firms

Changes in **tax collection** led to sharp responses in taxpayer's self reported sales

↑ withholding ⇒ ↑ self reported sales



↓ withholding ⇒ ↓ self reported sales



- Self-reported sales ↑ by 6 p.p. in response to 14.3 p.p. ↑ in withholding
- Self-reported sales ↓ by 2.5 p.p. in response to 11.7 p.p. ↓ in withholding

What's driving the response of self-reported sales?

- Aggregate impact should be interpreted as the **joint effect** of **3rd-party info** and **withholding** itself—as CAs do both simultaneously
- Can't separate the role of withholding vis-à-vis info reporting
- Yet, the **joint effect** is of first-order policy interest!
  $\longrightarrow$ implementing/expanding withholding typically encompass both features

Appointing firms as tax collectors is a promising tax administration tool

- $\uparrow$ coverage of withholding $\Rightarrow$ $\uparrow$ reported income by taxpayers $\Rightarrow$ $\uparrow$ 10% revenue
- Extra burden does not harm (large) CAs
- Downside: Tax admin have incentives to over-withhold (interest–free loan)

Why not have every firm do this?

- Extra burden may hurt SMEs (e.g., need accountants, segmentation) [Gadenne et al, 2022]
- Over-withholding and unrefunded credits can affect firm activity [Pinto & Scot, 2022]

OFFSHORE TAX EVASION

ZUCMAN QJE'13

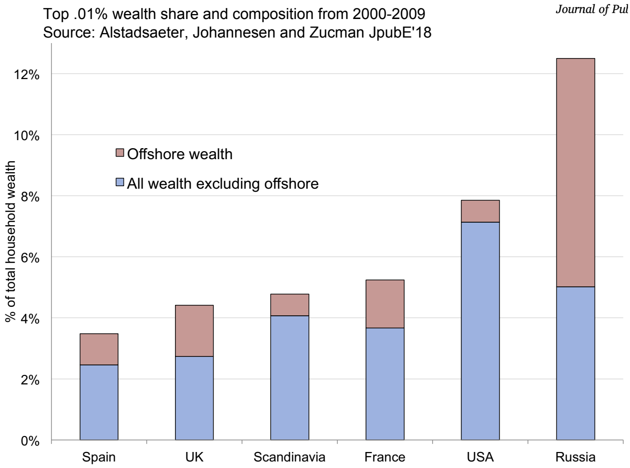
- Official stats substantially underestimate the net foreign asset positions of countries because they don't capture assets held by households in off-shore tax havens

  Example: US individual opens a Cayman Islands account and buys mutual fund shares (composed of US stock): Cayman Islands record a liability but US do not record an asset (because this is not reported in the US)

  $\Rightarrow$ Total world liabilities are larger than world total assets

- Zucman compiled all financial stats and estimates that ~8% of the global financial wealth of households is held in tax havens (three-quarters of which goes unrecorded = 6%)

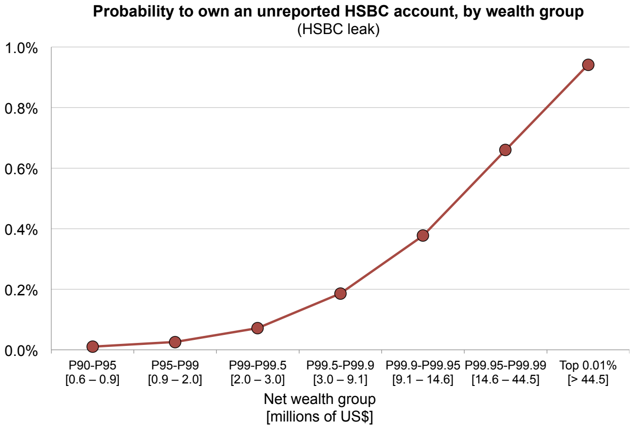
- Top 1% holds ~50% of total financial wealth $\Rightarrow$ 12% of financial wealth of the rich is hidden in tax heavens



Alstadsaeter-Johannesen-Zucman JpubE'18 use Bank for International Settlements (BIS) data to distribute offshore wealth across countries of origin

DISTRIBUTIONAL WEALTH IN TAX HAVENS

- Alstadsaeter-Johannesen-Zucman AER'19 link data from HSBC leak of accounts to Norwegian tax data
- Complete file of the clients of HSBC Switzerland was leaked in 2007 and obtained by tax authorities
- HSBC: large bank ($\simeq$ 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: linking done in Scandinavia
- Similar exercise done for Panama Papers leak and tax amnesty
- Londono-Avila '21 show that Panama Papers leak increased voluntary disclosure of evasion for Colombia wealth tax



Source: Alstadsæter (2019)

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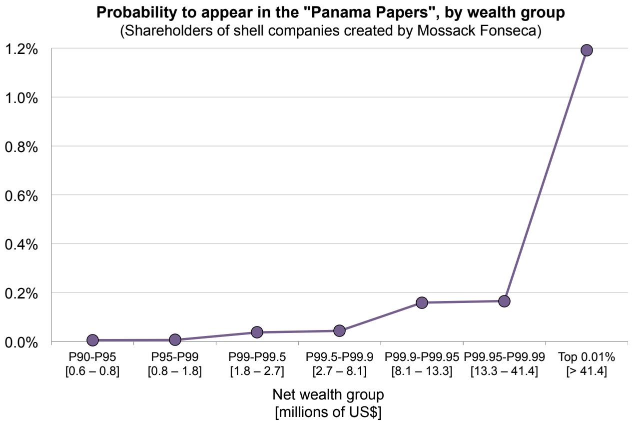

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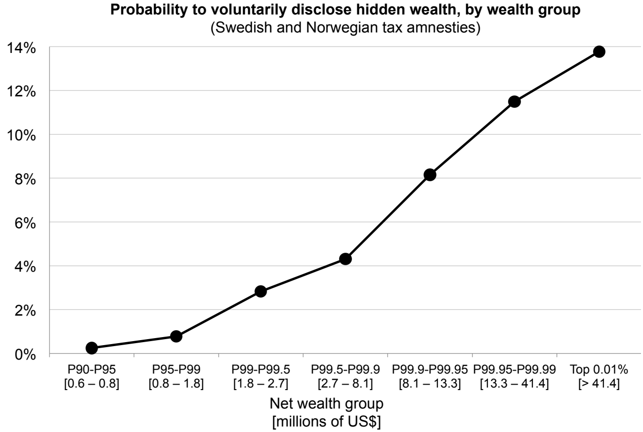

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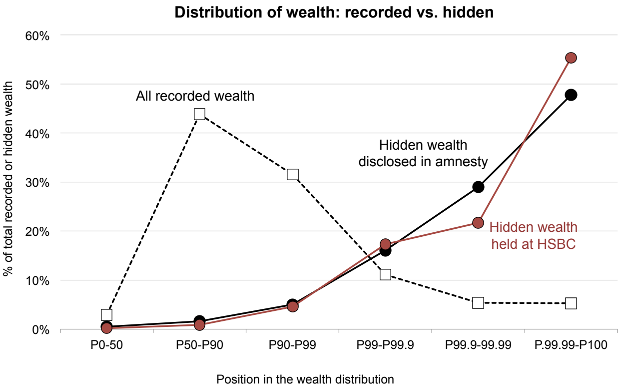

Source: Alstadsæter (2019)

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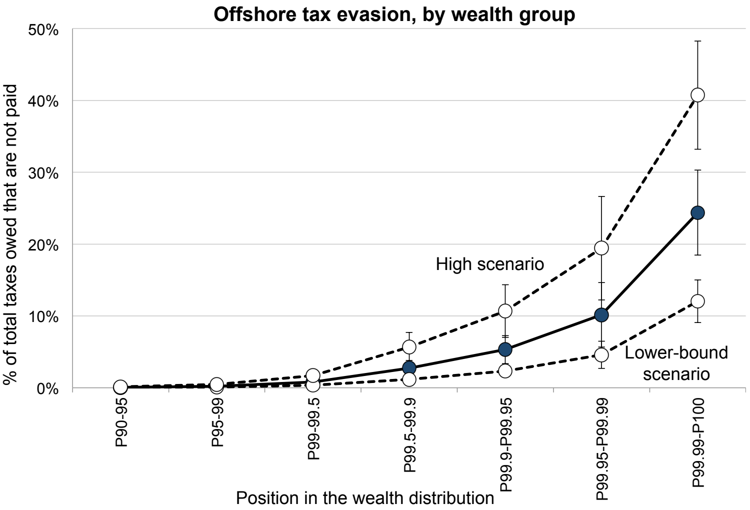

Offshore tax evasion, by wealth group
50%
40%
30%
20%
10%
0%
% of total taxes owed that are not paid
High scenario
Lower-bound scenario
P90-95
P95-99
P99-99.5
P99.5-99.9
P99.9-P99.95
P99.95-P99.99
P99.99-P100
Position in the wealth distribution

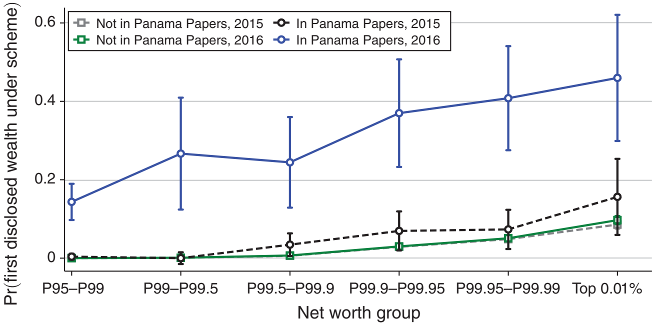


Figure 3. The Panama Papers Leak Raised Disclosures of Hidden Wealth

Notes: This figure presents the effect of the Panama Papers leak on disclosing wealth under Colombia's voluntary disclosure scheme. The markers plot raw means of the probability of first disclosing hidden wealth in 2015 (before the leak) and 2016 (after the leak) for taxpayers in the Panama Papers (round marker) and taxpayers not in the Panama Papers (square marker) by wealth group. The vertical lines represent the 95 percent confidence intervals. The Panama Papers leak in 2016 raised disclosures for those named in the leak. The sample is the universe of individuals filing income or wealth tax returns in 2015, 2016, or 2017, that is, 2,421,936 individuals—of which 1,167 appear named in the Panama Papers. Wealth groups are generated every year based on reported wealth including disclosures. The pre-leak differences in disclosures between taxpayers named versus not named in the Panama Papers are statistically significant (but economically negligible) for groups P99–P99.5 and P99.5–P99.9; they are not statistically significant for all other groups.

CURBING OFF-SHORE TAX EVASION

- Rich individuals can evade taxes on wealth and capital income using offshore accounts in tax havens with bank secrecy
- US passed FATCA in 2010: requires foreign banks to report accounts owned by US persons to IRS or face stiff penalties

  ⇒ Almost all banks complied (Panama papers leak risk)

  ⇒ Extended to all OECD+G20 countries in 2014: **Common Reporting Standard**

  ⇒ No good empirical evaluation yet but likely harder today to evade taxes through offshore accounts
- 2022 sanctions against Russian oligarchs shows need for transparency of offshore ownership

Londoño-Vélez & Tortarolo (2022)

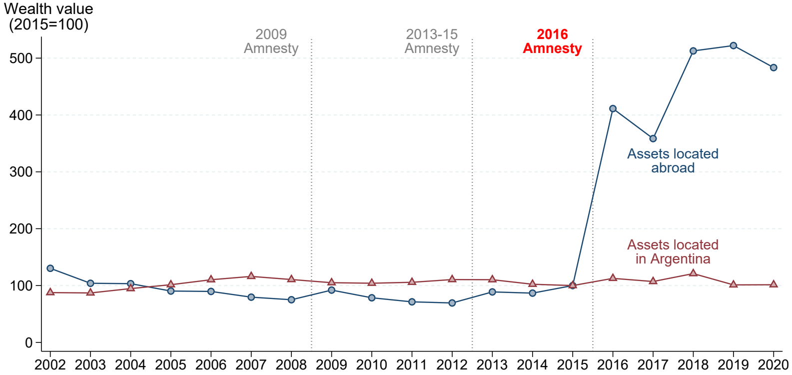
Revealing 21% of GDP in Hidden Assets: Evidence from Argentina's Tax Amnesties

Studies tax amnesties' effectiveness and impact on capital taxation and public spending using detailed data from wealth and income tax tabulations and pension benefits spanning two decades. **Findings:**

1. Despite substantial offshore tax evasion, declared foreign assets quadrupled in 2016
2. Tax progressivity improved because disclosures were extensive among top 0.1%
3. Improving tax compliance has sizable externalities on capital taxes and social transfers
   - Wealth and capital income tax bases more than doubled even 4 years later
   - Earmarked revenue boosted pension benefits by 15%

There is a more than 310% increase in the value of declared foreign assets

▸ ER



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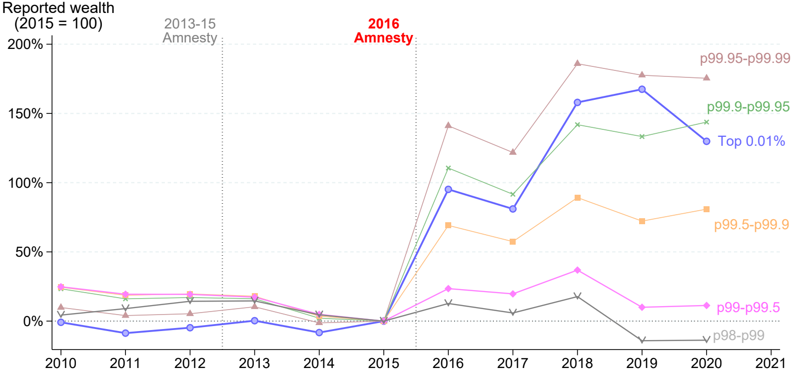
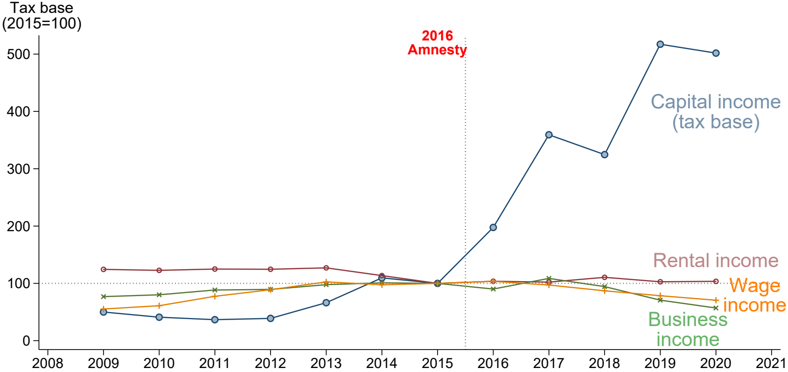
The increase in reported assets is greater for Argentina's top 0.1%



The capital income tax base tripled—and the increase persisted

▸ Levels ▸ Shares



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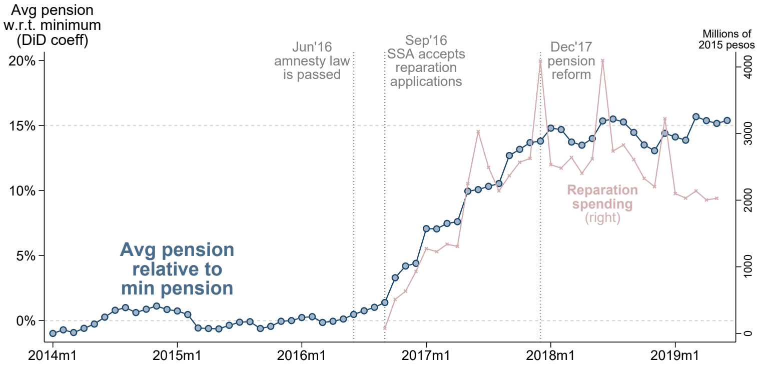
By earmarking revenue, the amnesty raised pension benefits by 15%

Levels



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