

Public Economics: Lecture 16

Tax Evasion & Avoidance

Cameron LaPoint

Columbia University

August 7, 2017

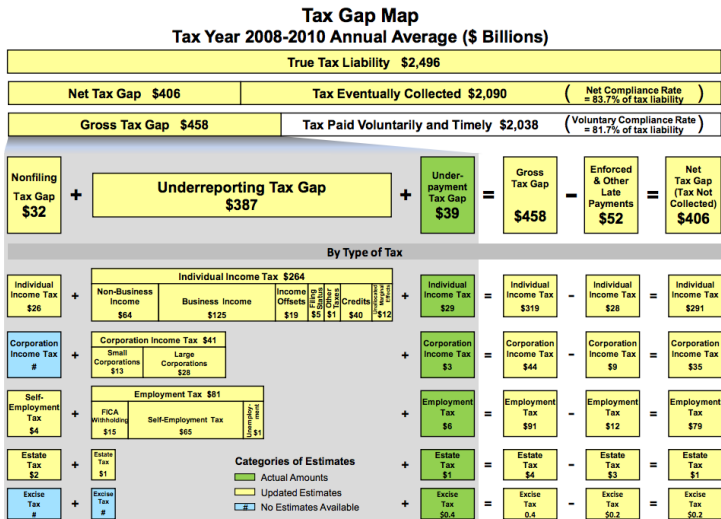
“The art of taxation consists in so plucking the goose as to obtain the largest possible amount of feathers with the smallest possible amount of hissing.”

– Jean-Baptiste Colbert, Minister of Finances under Louis XIV

The tax gap

- Tax gap: the difference between aggregate tax liability and what taxpayers actually pay in a timely manner
- According to IRS, annual average net tax gap in 2008 – 2010 was \$406 billion, or 16.3% of aggregate tax liability
- The gross tax gap over the same time period was \$458 billion (it includes late payments): \$32 billion due to nonfiling, \$387 billion due to underreporting, and \$39 billion due to nonpayment
- Underreporting (84.5% of the gross tax gap) is a form of tax evasion
 - ▶ **Tax evasion**: avoiding a portion of one's tax liability through *illegal* means (Example: hiding income in offshore bank accounts)
 - ▶ **Tax avoidance**: lowering one's tax liability through legally-approved means (Examples: deductions for charitable donations, writing off investment losses)

Tax evasion in the U.S.



Internal Revenue Service, April 2016

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

Source: <http://www.irs.gov/pub/irs-soi/p1415.pdf>

Tax evasion: the Allingham-Sandmo model

- Taxpayers are risk neutral – they only care about maximizing *expected after-tax income*
- Constant tax rate t , probability of getting caught p , penalty rate f as a fraction of tax liability
- Taxpayer picks amount of evasion E to maximize

$$\max_E \left\{ \underbrace{(1-p) \cdot [y - t \cdot (y - E)]}_{\text{if not caught}} + p \underbrace{[(1-t) \cdot y - f \cdot tE]}_{\text{if caught}} \right\}$$

- Evasion occurs if expected value of evasion is positive (true even with risk aversion): $(1-p) - p \cdot f > 0 \iff (1-p)/p > f$
- If we instead assume risk aversion, in each state of the world concave utility over after-tax income $u(\cdot) \implies E^*$ will be lower (why?)

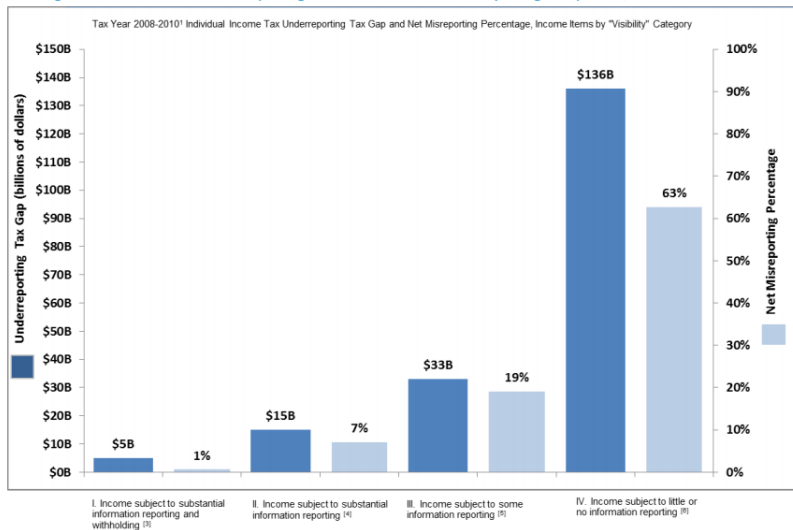
Puzzle in the tax evasion model

- Conclusion from the Allingham-Sandmo model is that taxpayers find it optimal to evade $E^* > 0$ whenever the penalty is low relative to the odds ratio: $(1 - p)/p > f$
- For U.S. income taxes, the probability of getting caught (or the audit probability) is $p \approx 0.01$
- Hence, to rule out evasion altogether, the government would have to set an extremely high penalty of $f = 99$
- But in practice $f < 1$, so the puzzle is why isn't everyone cheating if both the penalty rate and the audit probability are so low?

What is missing from this modeling framework?

- Underreporting varies a lot depending on the type of income: very low ($\approx 1\%$) for wages and salaries, but around 30% for business income
 - ▶ Tax authority's ability to uncover evasion depends on the existence of a paper trail – is there a report that can be cross-referenced to determine the true tax liability?
 - ▶ For this reason audit probability in U.S. $\approx 1\%$ overall but only 0.3% for taxpayers with no business, rental real estate, or farm income
- Audits may not always succeed in catching underreporting – basic audits consist of mailing forms/documents to the IRS
- Are taxpayers really risk neutral with respect to after-tax income? Potentially large risks (and psychological costs) to tax evasion
- Probability of detection may increase with amount of evasion – petty cheating (or benign underreporting due to mistakes) unlikely to be detected, but large amount of evasion more likely to trigger an audit

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

A field experiment in Denmark

- Kleven et al. (2011): randomized tax audit experiment in Denmark with 26,000 audits, using 80% of 2008 govt. tax enforcement budget
- Confirms that the threat of audit and the probability of audit (50% vs. 100%) matters for income reporting
- Significant effect of audit on reported income in the following year
- Altering the audit probability p and the penalty rate f has little effect on reported income among taxpayers who are subject to third-party reporting (i.e. company employees)
 - ▶ Suggests p and f play a large role in contexts where a large fraction of the population derives income from self-employment
- See Problem 4 of Problem Set 5

Tax audit experiment in Denmark

TABLE II
AUDIT ADJUSTMENTS DECOMPOSITION^a

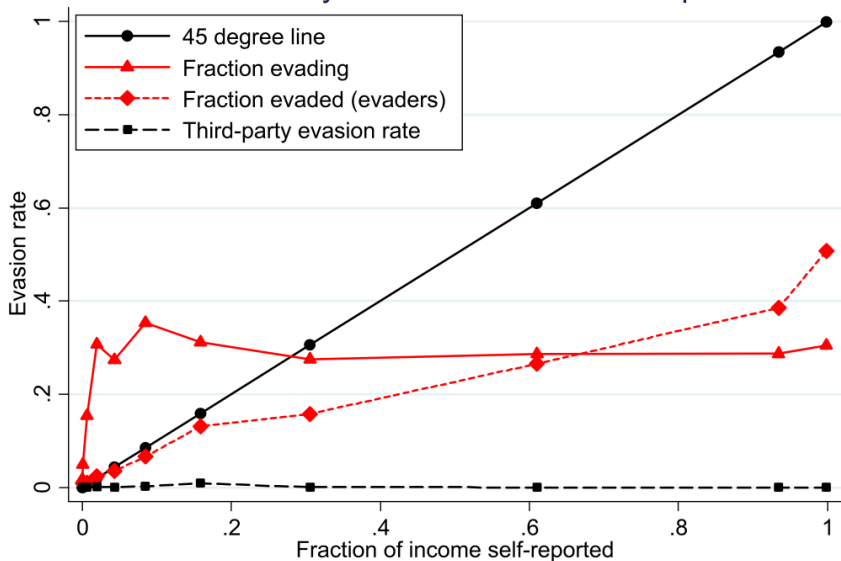
		A. Total Income Reported				B. Third-Party vs. Self-Reported Income			
		Pre-Audit Income	Audit Adjustment	Under- reporting	Over- reporting	Third-Party Income	Third-Party Under- reporting	Self- Reported Income	Self-Reported Under- reporting
		1	2	3	4	5	6	7	8
I. Net Income and Total Tax									
Net income	Amounts	206,038 (2159)	4532 (494)	4796 (493)	-264 (31)	195,969 (1798)	612 (77)	10,069 (1380)	4183 (486)
	% Nonzero	98.38 (0.09)	10.74 (0.22)	8.58 (0.20)	2.16 (0.10)	98.57 (0.08)	2.31 (0.11)	38.18 (0.35)	7.39 (0.19)
Total tax	Amounts	69,940 (1142)	1980 (236)	2071 (235)	-91 (11)				
	% Nonzero	90.76 (0.21)	10.59 (0.22)	8.41 (0.20)	2.18 (0.10)				
II. Positive and Negative Income									
Positive income	Amounts	243,984 (2511)	3776 (485)	3943 (485)	-167 (27)	223,882 (1860)	516 (76)	20,102 (1693)	3427 (478)
	% Nonzero	98.24 (0.09)	5.80 (0.17)	4.78 (0.15)	1.02 (0.07)	98.15 (0.10)	1.60 (0.09)	19.53 (0.28)	3.41 (0.13)
Negative income	Amounts	-37,946 (1014)	756 (71)	853 (69)	-97 (14)	-27,913 (406)	97 (12)	-10,033 (862)	756 (68)
	% Nonzero	79.09 (0.29)	6.45 (0.18)	5.13 (0.16)	1.32 (0.08)	78.21 (0.29)	0.75 (0.06)	29.49 (0.33)	4.99 (0.16)

2.3% evade

19.4% evade

Source: Kleven et al. (2011), "Unwilling or Unable to Cheat? Evidence from a Tax Audit Experiment in Denmark," *Econometrica*

B. Evasion by Fraction Income Self-Reported



Source: Kleven et al. (2011), "Unwilling or Unable to Cheat? Evidence from a Tax Audit Experiment in Denmark," *Econometrica*

The cost of tax evasion

- Tax evasion reduces revenue and requires adjusting other tax rates to make up for lost revenue
- Evasion thus imposes a social cost on society from excess burden due to higher taxes
- Should we care about the welfare of cheaters?
 - ▶ By choosing to evade, taxpayers are taking on more risk
 - ▶ Evaders are worse off compared to the situation where they pay the same tax liability (after paying fines) but without cheating
- Other implications: horizontal inequity because people have different opportunities to evade taxes
 - ▶ These differences lead to failure of the Atkinson-Stiglitz theorem \implies tax on both capital and labor income is optimal

Fiscal externalities

- When there is a change in the tax rate on some initial tax base z , there are behavioral responses of consumption and labor supply, but also changes to how taxpayers report income
- **Fiscal externality**: effect of the initial tax change in z spills over to tax revenue in some other tax base z^B
- Fiscal externalities involve taxpayers moving income from one tax base to another via two possible ways (tax avoidance):
 - ① **Income shifting**: z^B is a different tax base in the same time period (e.g. labor income \rightarrow corporate income tax base)
 - ② **Intertemporal substitution**: z^B is the same tax base as z but in a different time period (e.g. future income)
- Efficiency and optimal tax analysis depend on the effect of a tax on total tax revenue, so must take fiscal externalities into account

Revenue-maximizing linear tax rate

- The income tax rate that maximizes government revenue is *higher* in the presence of a fiscal externality
- Suppose two tax bases, taxable labor income z and another taxable form of income z^B (e.g. capital gains), with total values Z and Z^B
- Govt. faces the linear revenue constraint $R = \tau \cdot Z + \tau^B \cdot z^B$
- When no fiscal externality:

$$\frac{dR}{d\tau} = Z + \tau \cdot \frac{dZ}{d(1-\tau)} \cdot \frac{d(1-\tau)}{d\tau}$$

- One can show the revenue-maximizing tax rate is:

$$\tau^* = \frac{1}{1 + \varepsilon_{Z,1-\tau}}$$

- $\varepsilon_{Z,1-\tau}$ is the elasticity of taxable labor income

τ^* with fiscal externalities

- When a change in τ spills over to the other taxable income base, the cross-tax elasticity $\varepsilon_{Z^B, 1-\tau}$ becomes relevant
- With a fiscal externality...

$$\frac{dR}{d\tau} = Z + \tau \cdot \frac{dZ}{d(1-\tau)} \cdot \frac{d(1-\tau)}{d\tau} + \tau^B \cdot \frac{dZ^B}{d(1-\tau)} \cdot \frac{d(1-\tau)}{d\tau}$$

- The revenue-maximizing tax rate is now instead:

$$\tau^* = \frac{1}{1 + \varepsilon_{Z, 1-\tau}} - \varepsilon_{Z^B, 1-\tau} \cdot \frac{\tau^B (Z^B / Z)}{1 + \varepsilon_{Z, 1-\tau}}$$

- If there is income shifting or intertemporal substitution
 $\varepsilon_{Z^B, 1-\tau} < 0 \implies \tau^* \uparrow$ relative to the case without a fiscal externality
- Note the dependence on τ^B : when the other tax base z^B has a high tax rate, less total revenue is lost from raising τ

Intertemporal substitution – stock options

- Goolsbee (2000): “What Happens When You Tax the Rich?”
 - ▶ Analyzes how CEO pay changes when the top marginal income tax rate increases from 31% to 39.6% in 1993 (tax hike announced in 1992)
 - ▶ Executives exercise stock options to buy company shares in 1992
 - ▶ Stock options yield a discounted price on shares relative to the trading price – the discount on shares is taxed as income at 31%
 - ▶ Small long-term effect of the tax reform on taxable income – only large short-term effect due to shifting income to the future
- When stock shares sold later on, profits are taxed as a capital gain rather than taxable income \implies lower tax rate (28% at the time) if assets held for more than a year
- Note this is tax avoidance not evasion (nothing illegal here)

Exercising stock options to avoid income taxes

AVERAGE COMPENSATION BY TYPE FOR HIGH-INCOME EXECUTIVES
(in Thousands)

	1991	1992	1993	1994	1995
Taxable income	911	1,153	974	965	1,173
Salary	347	336	336	351	373
Bonus	198	207	241	284	330
LTIP payout	57	72	57	64	89
Options exercised	268	496	293	235	381
Other income (nontaxed)	36	37	66	54	78

SOURCE.—Author's calculations for executives with permanent income greater than \$275,000 per year.

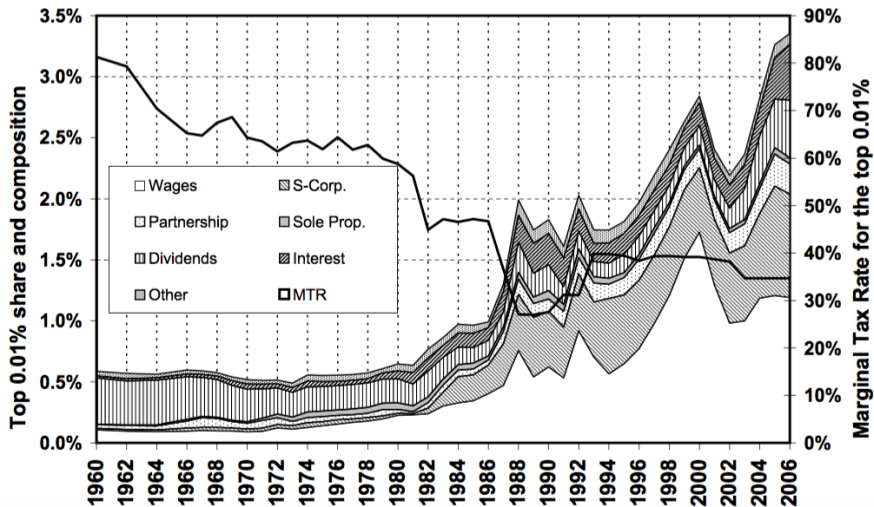
Source: Goolsbee (2000), "What Happens When You Tax the Rich? Evidence from Executive Compensation," *Journal of Political Economy*

Income shifting

- As discussed in the lecture on inequality, businesses can be organized as corporations or as pass-through entities (e.g. S-corps)
- Corporate profits first taxed by corporate income tax τ_c , then net-of-tax profits taxed again after distribution to shareholders
- Two redistribution options:
 - ▶ Pay out as dividends taxed at rate τ_d
 - ▶ Retain profits and reinvest in the company \implies shareholders realize capital gains when finally selling the stock, taxed at τ_{cg}
- Different tax regime for pass-through entities: profits taxed directly and solely as individual income at rate τ_i
- If your company can be reclassified as a pass-through, compare retention rate under corporate tax regime to the income tax regime
- Owners prefer corporate tax regime if $(1 - \tau_c) \cdot (1 - \tau_{d,cg}) > 1 - \tau_i$

$\tau_i \downarrow$ after TRA 1986

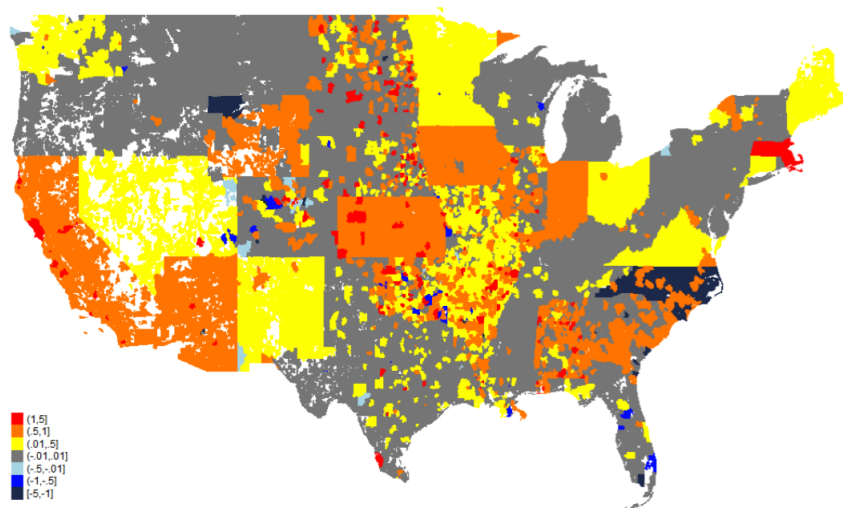
The Top 0.01% US Income Share, Composition, and MTR



Consumer sales tax avoidance

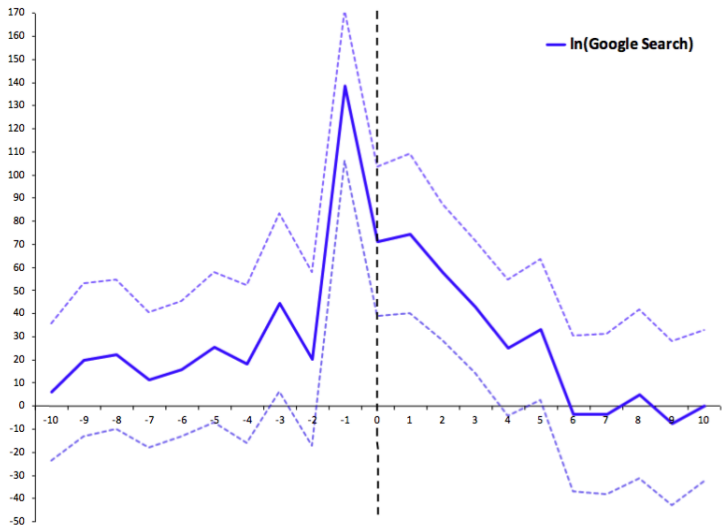
- Sales taxes in the U.S. may vary even at the zip code level
- Do consumers avoid sales taxes?
- Recent paper by Baker et al. (2017) says yes, and shows that consumers use three strategies to lower taxes paid on expenditures
 - 1 Intertemporal substitution: stockpile durable goods in advance of an anticipated sales tax increase
 - 2 Make purchases from online retailers located outside the shopper's state and evade any [use taxes](#)
 - 3 Shop in other areas for lower sales tax rates (e.g. drive to another state without a sales tax like New Hampshire)
- Evidence for shopping complementarities: since there are fixed costs to shopping around for lower sales tax rates, people stock up on tax-exempt goods when shifting expenditures forward
- Suggests that sales-tax *changes* are salient

Sales tax rate changes, 2008-14



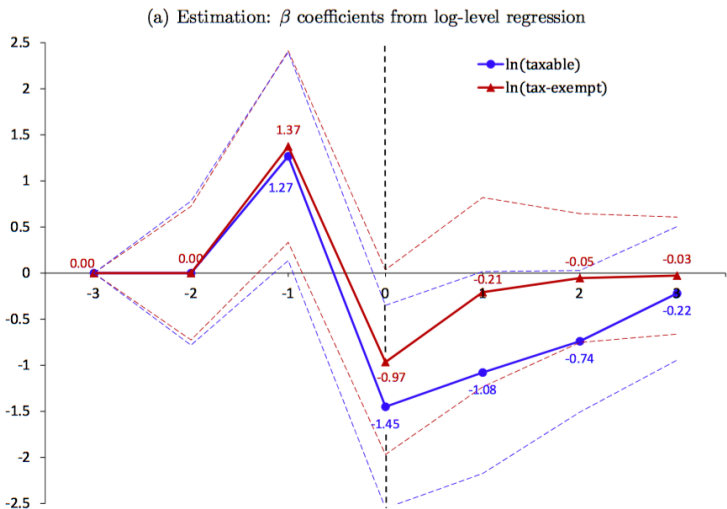
Source: Baker, Johnson, & Kueng (2017), "Shopping for Lower Sales Tax Rates," <https://ssrn.com/abstract=2893738>

(b) Google Search around state sales tax rate changes (in %)



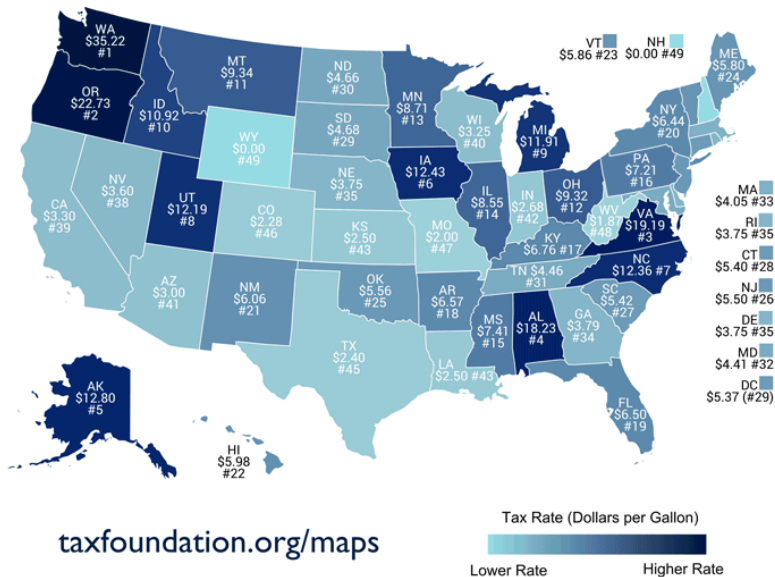
Source: Baker, Johnson, & Kueng (2017), "Shopping for Lower Sales Tax Rates," <https://ssrn.com/abstract=2893738>

Sales tax avoidance and shopping complementarities



Source: Baker, Johnson, & Kueng (2017), "Shopping for Lower Sales Tax Rates," <https://ssrn.com/abstract=2893738>

Liquor excise tax rates in the U.S.

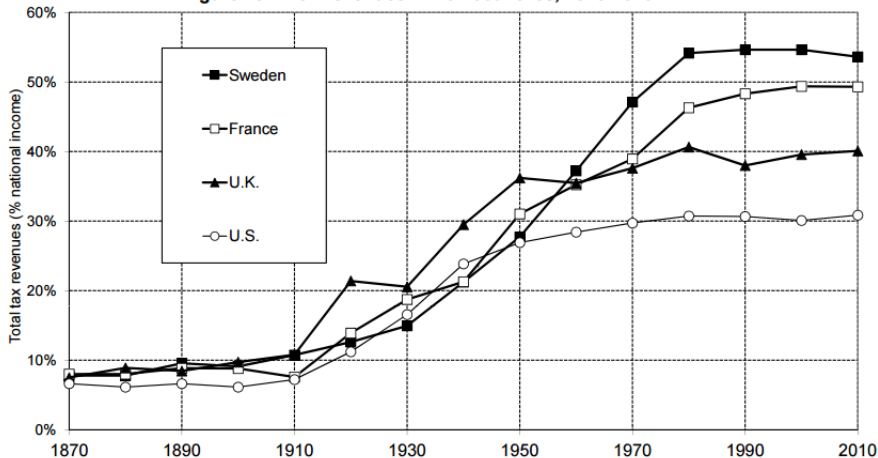


Tax administration

- Large expansion in tax revenues as a fraction of national income among rich countries over the 20th century
- Many narratives for differences in tax revenue collection across developing and developed countries
 - ▶ Govt. is itself a normal good, and it grows as people become richer and demand more public goods
 - ▶ Political institutions: enforcing property rights helps establish taxpayers' ability to pay
 - ▶ Transition from self-employment to employee-jobs over the long run of development can explain growth in income tax capacity
- Developing countries rely heavily on corporate profits taxes and tariffs, and other non-tax forms of revenue (e.g. military draft, public works, seignorage)
- Reliance on seemingly inefficient forms of revenue collection due to constraints (e.g. political corruption)

Expansion of ability to collect revenue

Figure 13.1. Tax revenues in rich countries, 1870-2010



Source: Piketty (2014), Chapter 13, <http://piketty.pse.ens.fr/en/capital21c2>

Revenue collection and property rights

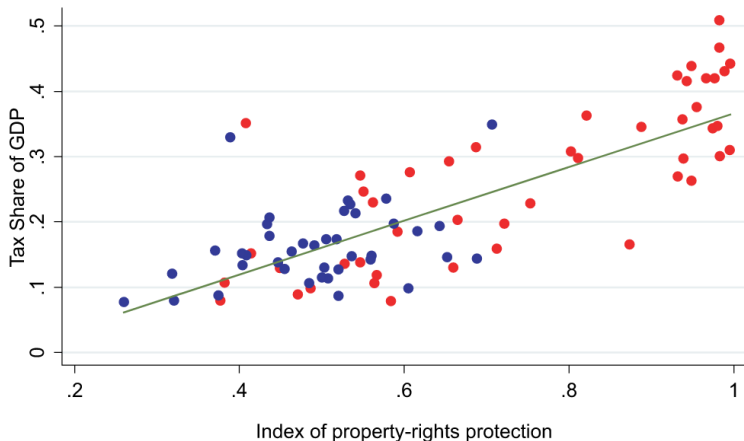
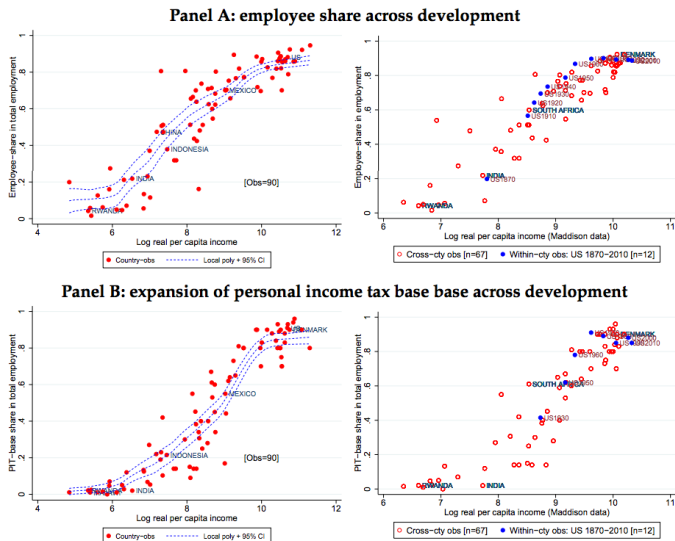


FIGURE 1.—Patterns of fiscal and legal capacity. ● denotes above median income in 1980; ● denotes below median income in 1980; — denotes fitted values.

Source: Besley & Persson (2010), "State Capacity, Conflict, and Development," *Econometrica*

FIGURE 4: EMPLOYEE SHARE, SIZE AND EMPLOYMENT-COMPOSITION OF INCOME TAX BASE

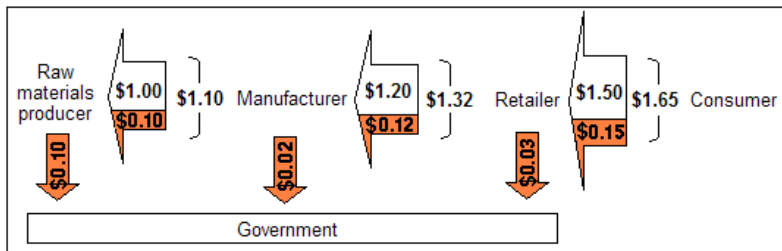
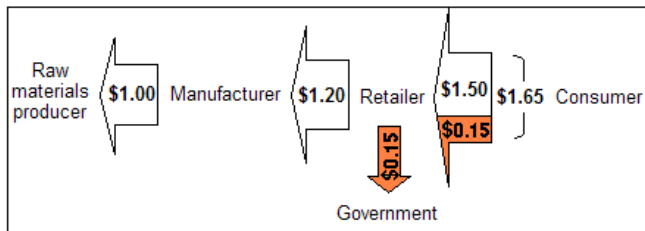


Source: Jensen (2016), "Employment Structure and the Rise of the Modern Tax System," LSE job market paper

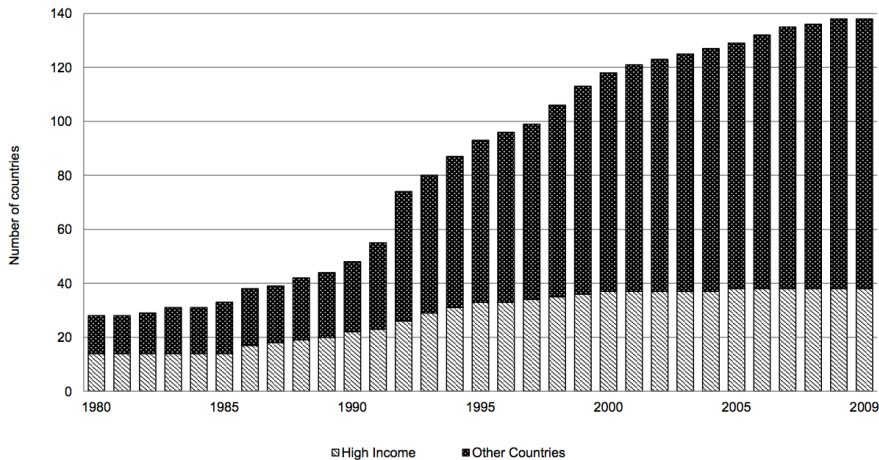
VAT – the gold standard of taxation?

- Retail sales tax is imposed at the point of sale and collected from retailers (in practice charge consumers and then remit to govt.)
- Value-added tax (VAT) is imposed on the *net value added* at each point in the production chain
- Main advantage of the VAT: tax credit and debit system of the VAT generates third-party reporting in transactions across firms
 - ▶ Popular in developing countries with low capacity for tax enforcement and information collection because firms report on each other
- “Last mile” problem of the VAT: at the final consumer stage consumers have no incentive to ask for receipts and report retailers for underreporting sales
 - ▶ Naritomi (2016): cash prize lotteries and tax rebates to Brazilian consumers who ask for a receipt using their Social Security Number
 - ▶ Program increased reported tax revenue from retailers by 22% over four years

Retail sales tax (RST) vs. VAT – diagrams



VAT adoption, 1980 – 2009



Source: World Bank Open Learning Campus, http://olc.worldbank.org/sites/default/files/Stern_slides.pdf

Summary

- Tax evasion imposes efficiency costs from higher tax rates needed to collect the same revenue target
- Simple modeling framework ignores many features of the taxpayer's decision of whether or not to evade tax liability
- In practice information about earnings is key determinant of the state's ability to collect taxes – much easier for self-employed to engage in evasion due to lack of third-party reporting
- Developed and developing countries face different constraints in their ability to collect revenue – informal vs. formal sectors of employment
- VAT is an imperfect substitute for a strong tax authority, but popular in developing countries – evasion opportunities in last link of the chain