Responses of Taxable Income

ECON 3003
Advanced Public Economics

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GOALS OF THIS LECTURE

1) Cover empirical studies looking at *broader* effects of taxation (beyond labour supply) → Elasticity of Taxable Income (ETI)

2) Understand key methodologies such as diff-in-diff and time series methods

3) Critically discuss papers' methodologies and results so as to practice our research skills

ELASTICITY OF TAXABLE INCOME (ETI)

Taxable Income = Ordinary Income + Realized Capital Gains – Deductions

⇒ Each component can respond to taxes

Modern public finance literature focuses on taxable income elasticities (ETI) instead of hours/participation elasticities

Two main reasons:

1) **Policy:** what matters for policy is the total behavioral response to tax rates (not only hours of work but also occupational choices, avoidance, etc.)
2) **Data availability:** taxable income is precisely measured in tax return data

Overview of ETI literature: Saez-Slemrod-Giertz JEL'12

CHANNELS OF TAXABLE INCOME RESPONSES

(1) Quantitative labor supply responses: hours worked, participation

(2) Qualitative labor supply responses: effort on the job, type of job, training, education

(3) Changes in savings and portfolio choice

(4) Legal shifting of income into untaxed or lower-taxed form [tax avoidance]

(5) Illegal under-reporting of income [tax evasion]

TOP INCOME TAX RATE CHANGES

Tax rates change frequently over time. Biggest tax rate changes have happened at the top:

The UK experienced dramatic changes. E.g., Thatcher tax cuts:

- Top rate ↓ from 83% to 60% in 1979
- and further ↓ to %40 in 1988

The US provides very interesting variation

- Reagan I: ERTA'81: top rate ↓ 70% to 50% (1981-1982)
- Reagan II: TRA'86: top rate ↓ 50% to 28% (1986-1988)
- Clinton: OBRA'93: top rate ↑ 31% to 39.6% (1992-1993)
- Bush: EGTRRA '01: top rate ↓ 39.6% to 35% (2001-2003)
- Obama '13: top rate ↑ 35% to 39.6%+3.8% (2012-2013)
- Trump '17: top rate cut down to 37%+3.8% (2017-2018)

Historically, high MTRs above 80% not unusual (See)

LONG-RUN EVIDENCE (US AND UK)

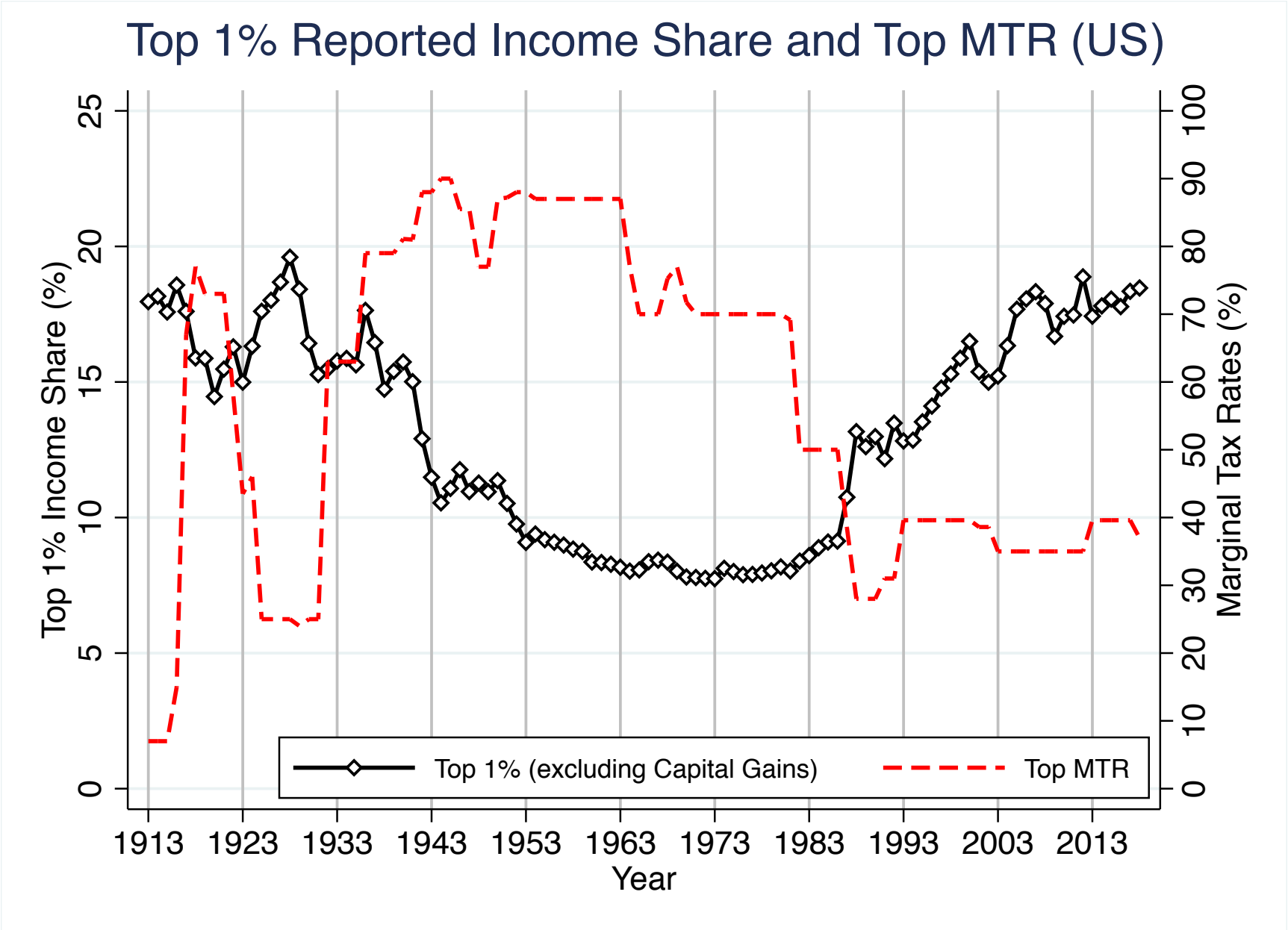
Goal: evaluate whether top **pre-tax** incomes respond to changes in one minus the marginal tax rate (=net-of-tax rate)

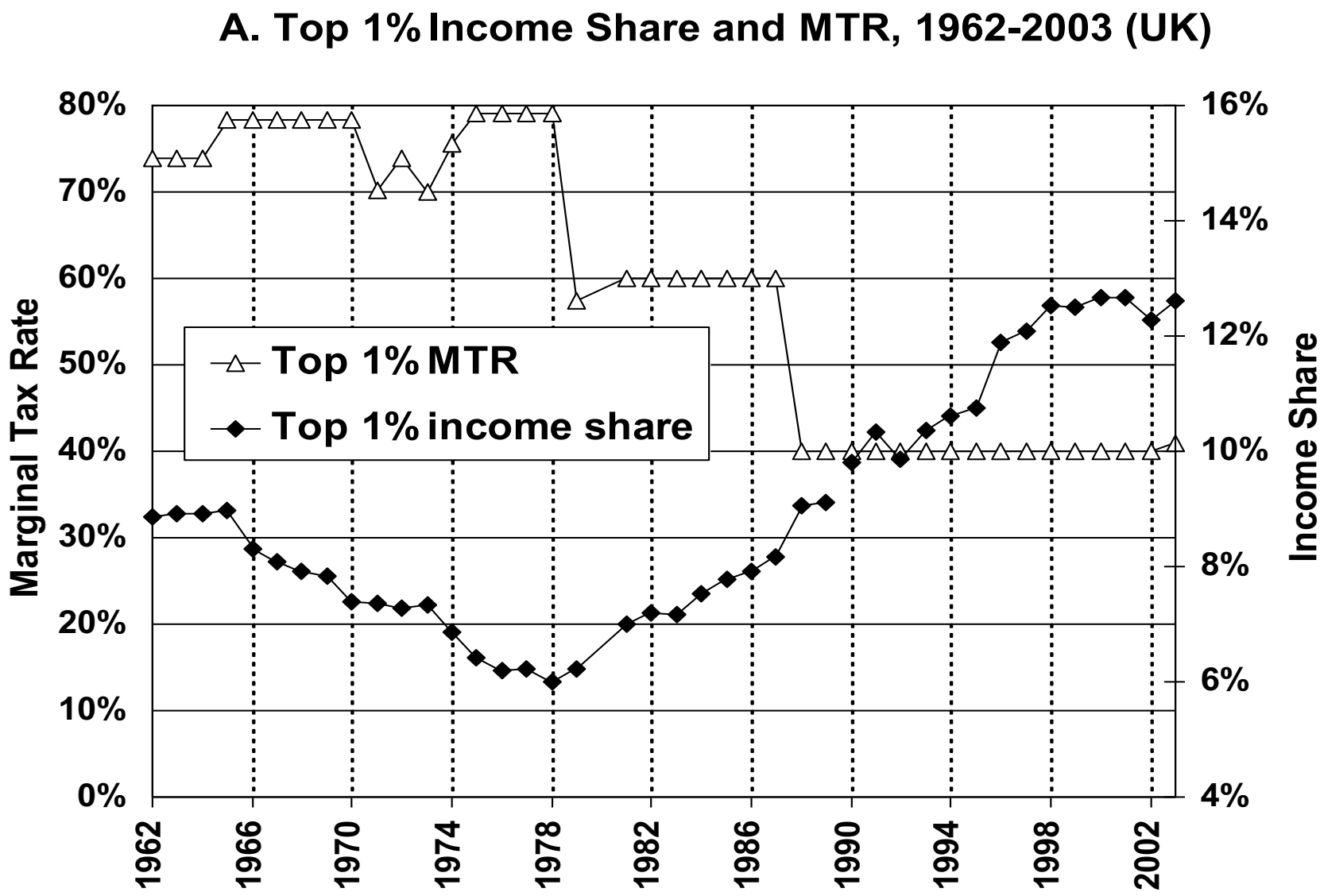
Focus on **pre-tax** income before deductions, excluding realized capital gains (because they are taxed at lower separate rate)

Piketty-Saez QJE'03 estimate top income shares since 1913 [IRS tabulations for 1913-1959, IRS micro-files since 1960]

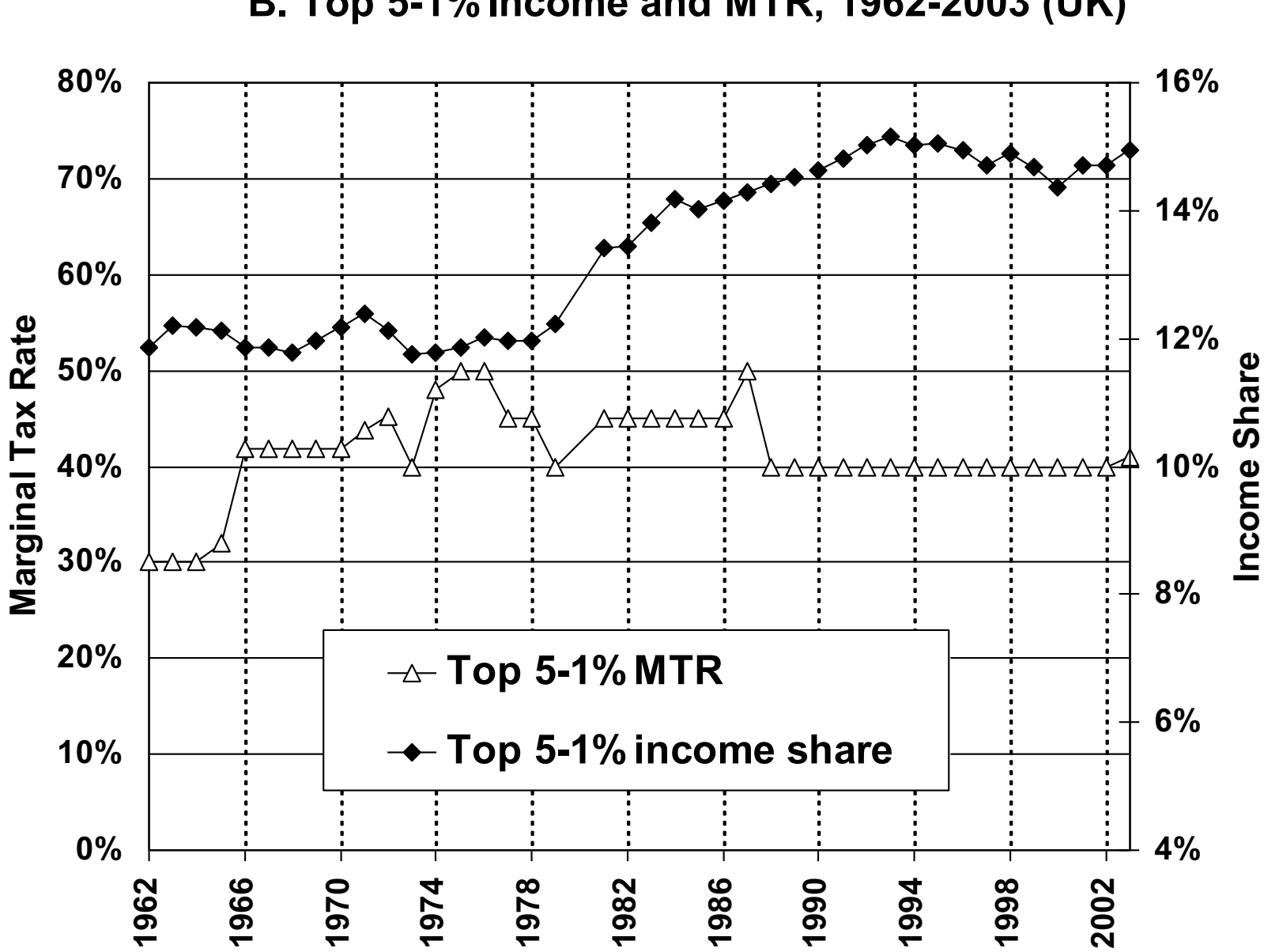
Piketty-Saez-Stantcheva AEJ-EP'14 estimate the effect of top MTR on top income shares in the US since 1913

Brewer-Saez-Shephard (2010) use top income share analysis in the UK 1962-2003 to estimate the ETI


Top 1% Reported Income Share and Top MTR (US)
Top 1% Income Share (%)
0
5
10
15
20
25
Marginal Tax Rates (%)
0
10
20
30
40
50
60
70
80
90
100
1913
1923
1933
1943
1953
1963
1973
1983
1993
2003
2013
Year
Top 1% (excluding Capital Gains)
Top MTR



Source: Brewer-Saez-Shepard (2010)



Source: Brewer-Saez-Shepard (2010)

Brewer-Saez-Shephard (2010)

Figure A: top 1% MTR and income share, 1962-2003 (UK)

- MTR increases from 1962 to 1978; dramatically declines in the two key income tax reforms of 1979 and 1988
- Top 1% income share declines up to 1978, and increases sharply exactly when the top MTR was reduced in 1979
  $\Rightarrow$ suggests top income shares did respond to lower MTR

Figure B: next 4% MTR and income share, 1962-2003 (UK)

- MTR in 1978 is virtually identical to the current MTR: Thatcher cut the progressivity within the top 1%, but had relatively small effects on those with slightly lower incomes
- Income share of the next 4% also shows a break in 1979: goes from 12% to 15% despite there being little change in the MTR

INCOME SHARE BASED ELASTICITY ESTIMATION

1) **Tax Reform Episode:** Compare top **pre-tax** income shares at t_0 (before reform) and t_1 (after reform)

$$e = \frac{\log sh_{t_1} - \log sh_{t_0}}{\log(1 - \tau_{t_1}) - \log(1 - \tau_{t_0})}$$

where sh_t is pre-tax top income share and τ_t is the average MTR for top group in year t

Identification assumption: absent tax change, $sh_{t_0} = sh_{t_1}$

2) **Full Time Series:** Run regression:

$$\log sh_t = \alpha + e \cdot \log(1 - \tau_t) + \varepsilon_t$$

adding time controls to capture non-tax related top income share trends

Identification assumption: non-tax related changes in $sh_t \perp \tau_t$

Table 2.1. Elasticity estimates for top income earners

		Simple difference	Simple difference (excluding consumption tax from MTR)	DD using top 5-1% as control
		(1)	*(2)*	*(3)*
1978 vs. 1981	(short run)	0.34	0.32	0.08
1986 vs. 1989	(short run)	0.37	0.38	0.41
1978 vs. 1962	(long run)	0.61	0.63	0.86
2003 vs. 1978	(long run)	0.93	0.89	0.64
Full time-series regression		0.73	0.69	0.46
(s.e. in brackets)		(0.13)	(0.12)	(0.13)

Note: Authors' calculations using data underlying Figures 2.2A and 2.2B.

$$e = \frac{\log sh_{t_1} - \log sh_{t_0}}{\log(1-\tau_{t_1}) - \log(1-\tau_{t_0})} = \frac{\log(12.6) - \log(6)}{\log(1-0.53) - \log(1-0.79)} = 0.93$$

Does the id assumption hold? Col (1) and (2) provide unbiased estimates only if, absent the tax change, the top 1% income share would have remained constant $\Rightarrow$ Contradicted by increase in top 5-1% income share in spite of no change in MTRs. Diff-in-diff in Col (3) is more convincing.

LONG-RUN EVIDENCE IN THE US/UK

1) Clear correlation between top incomes and top income rates both in several short-run tax reform episodes and in the long-run: estimated elasticities are large (around 0.7 for long-run)

2) Correlation between tax rates and income shares largely absent below the top 1% (such as the next 5%)

3) Top income shares sometimes do not respond to large tax rate cuts [e.g., Kennedy Tax Cuts of early 1960s]

2) and 3) suggest that **context matters** (such as opportunities to respond / avoid taxes matter). Response unlikely to be due to a universal labor supply elasticity

UK and US setting yield qualitatively similar results and pose the same key problems (e.g., Δtax correlated with non-tax factors driving top incomes)

KLEVEN AND SCHULTZ AEJ-EP'14

Important study finds smaller elasticities in Denmark

Key advantages:

(a) Use full population of tax returns since 1980 (large sample size, panel structure, many demographic variables, stable inequality)

(b) A number of reforms changing tax rates differentially across three income brackets and across tax bases (capital income taxed separately from labor income)

(a)+(b) $\Rightarrow$ allows to overcome bias from (i) non-tax changes in inequality and (ii) mean reversion

(c) Show compelling visual DD-evidence of tax responses around the 1987 large reform: Define T and C in year 1986 (pre-reform), follow the same group in years before/after the reform (panel analysis)

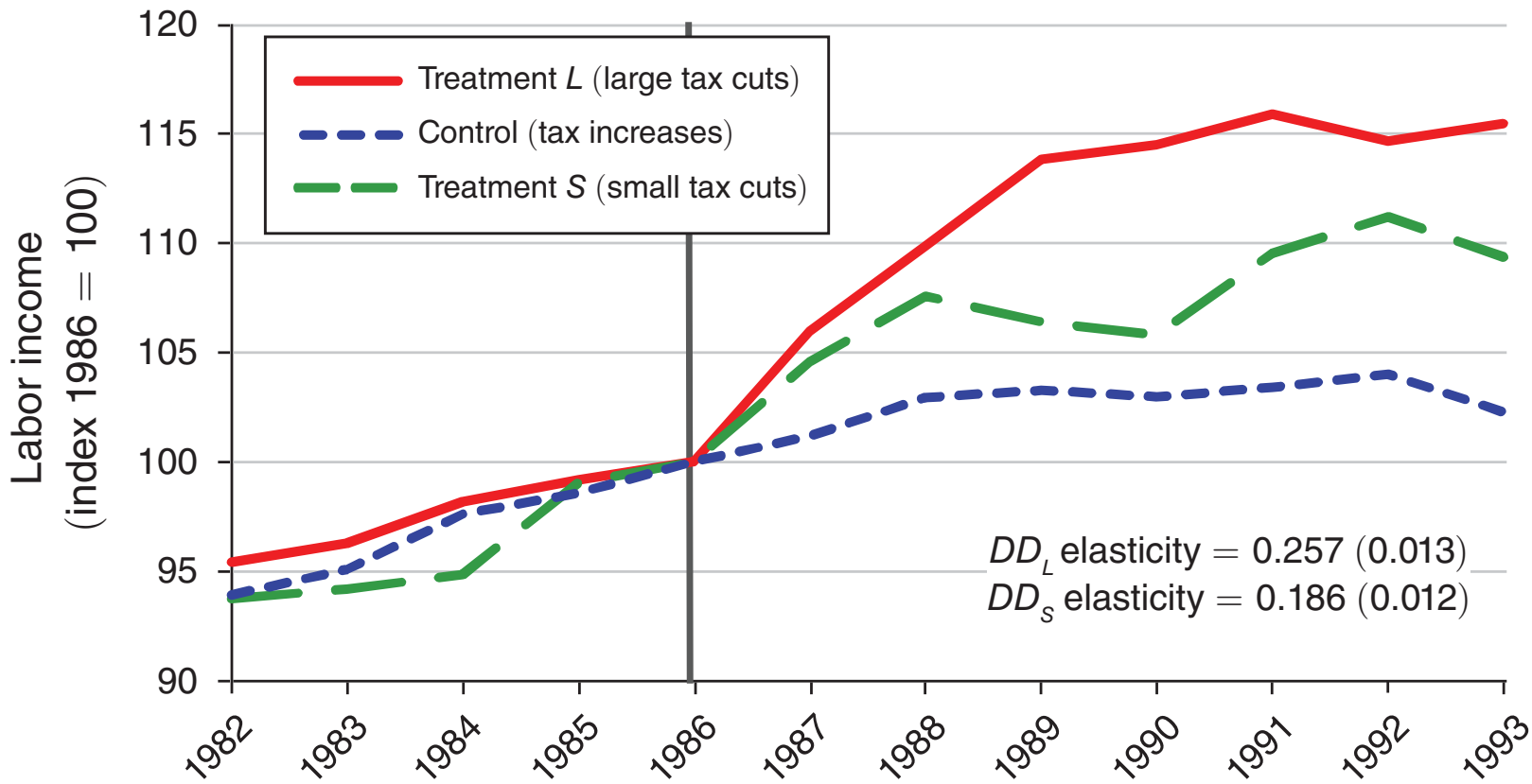


FIGURE 4. GRAPHICAL EVIDENCE ON TAXABLE INCOME RESPONSES TO THE DANISH 1987 REFORM

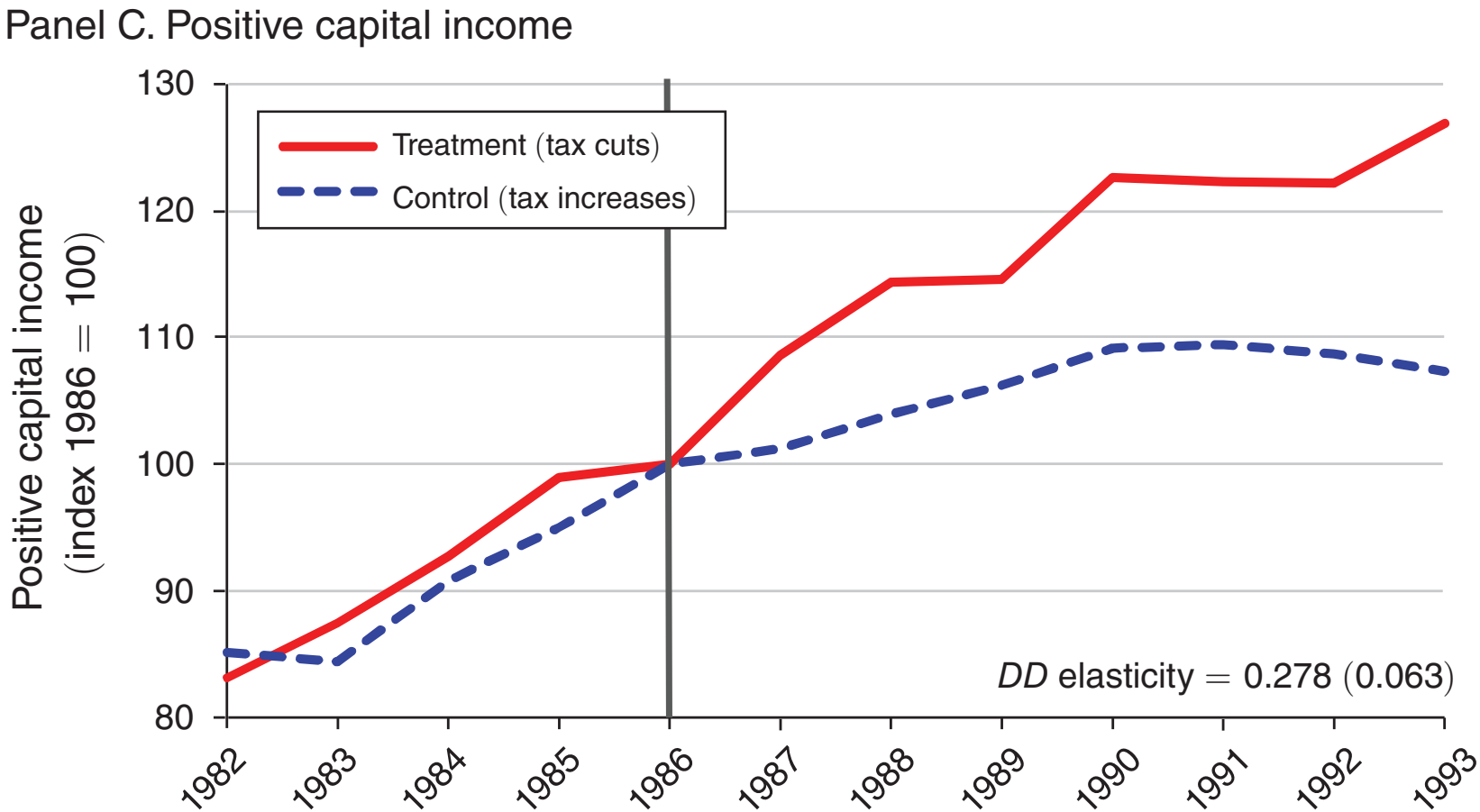


FIGURE 4. GRAPHICAL EVIDENCE ON TAXABLE INCOME RESPONSES TO THE DANISH 1987 REFORM (*Contin*

KLEVEN AND SCHULTZ AEJ-EP'14

Key Findings:

(a) Small labor income elasticities (.05 for wage earners, .10 for self-employed)

(b) Bigger capital income elasticities (.3)

(c) Bigger elasticities for larger tax changes (overcome optimization frictions suggested by Chetty et al QJE'11)

(d) Modest income shifting between labor and capital in Denmark (top rates on labor and capital are carefully aligned)

$\Rightarrow$ Danish tax system optimized to have broad base and few avoidance opportunities. Ensures modest behavioral responses

TAX AVOIDANCE

Behavioral response to income tax comes not only from reduced work effort and economic activity but also from tax avoidance.
Two main forms of tax avoidance:

1) **Intertemporal substitution:** Shift income over time to take advantage of tax changes: Example: If tax rates increase next year, shift income from next year into this year

2) **Income shifting:** Shift income to another tax base that is taxed less. Example: shift business profits from corporate tax base to the individual tax base if this is tax advantageous

Tax avoidance affects tax revenue through these other tax bases and such revenue effects need to be accounted for in optimal tax analysis (fiscal externalities)

Intertemporal Substitution

Realized Capital Gains

Realized capital gains occur when individual sells asset at a higher price than buying price (e.g., Bitcoin)

Individuals have flexibility in the timing of asset sales and capital gains realizations

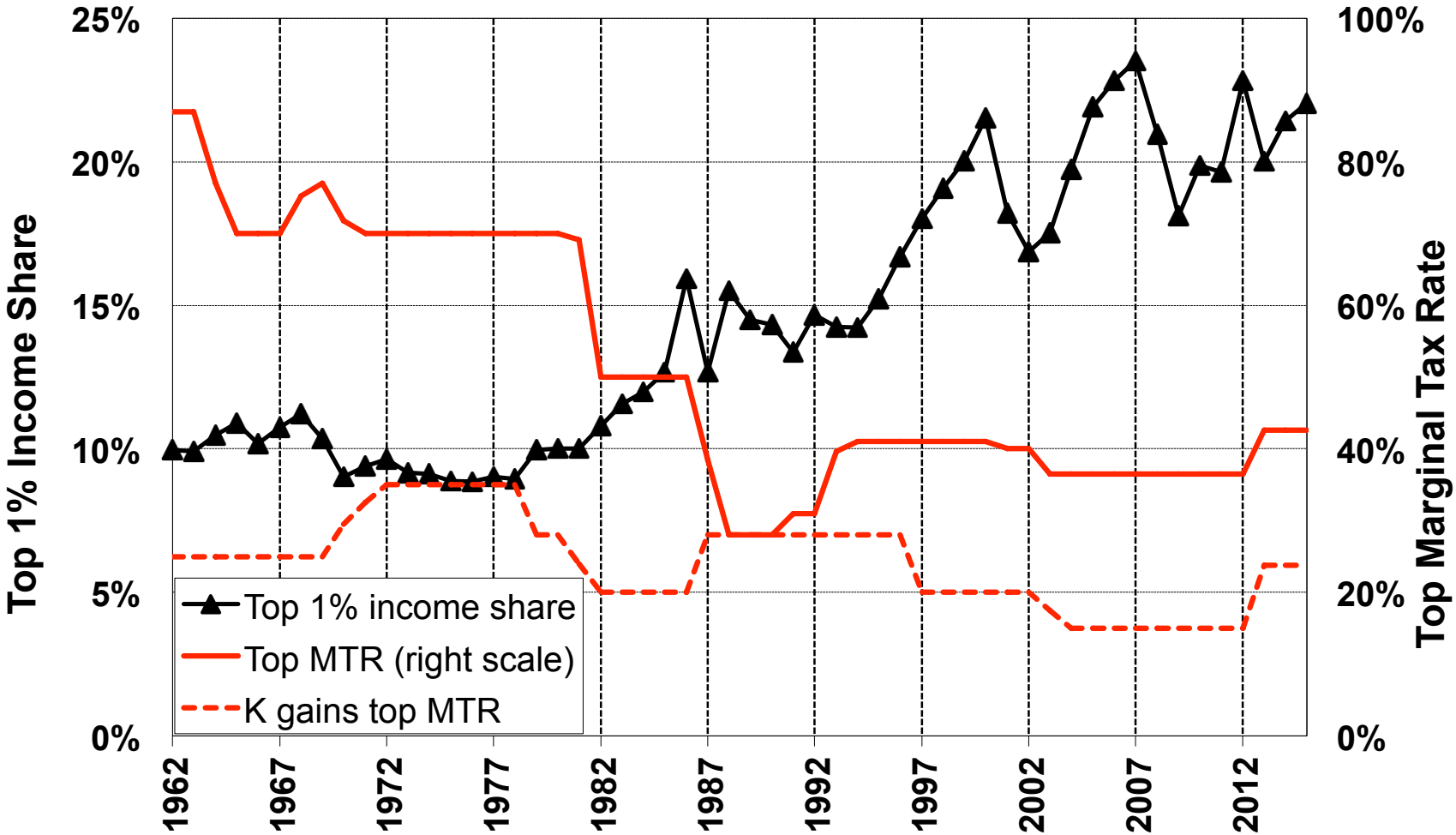
TRA'86 lowered top tax rate on ordinary income from 50% to 28% but increased top tax rate on realized capital gains from 20% to 28%

2013: tax rate on capital gains increased from 15% to 20%+3.8% (see Saez 2017)

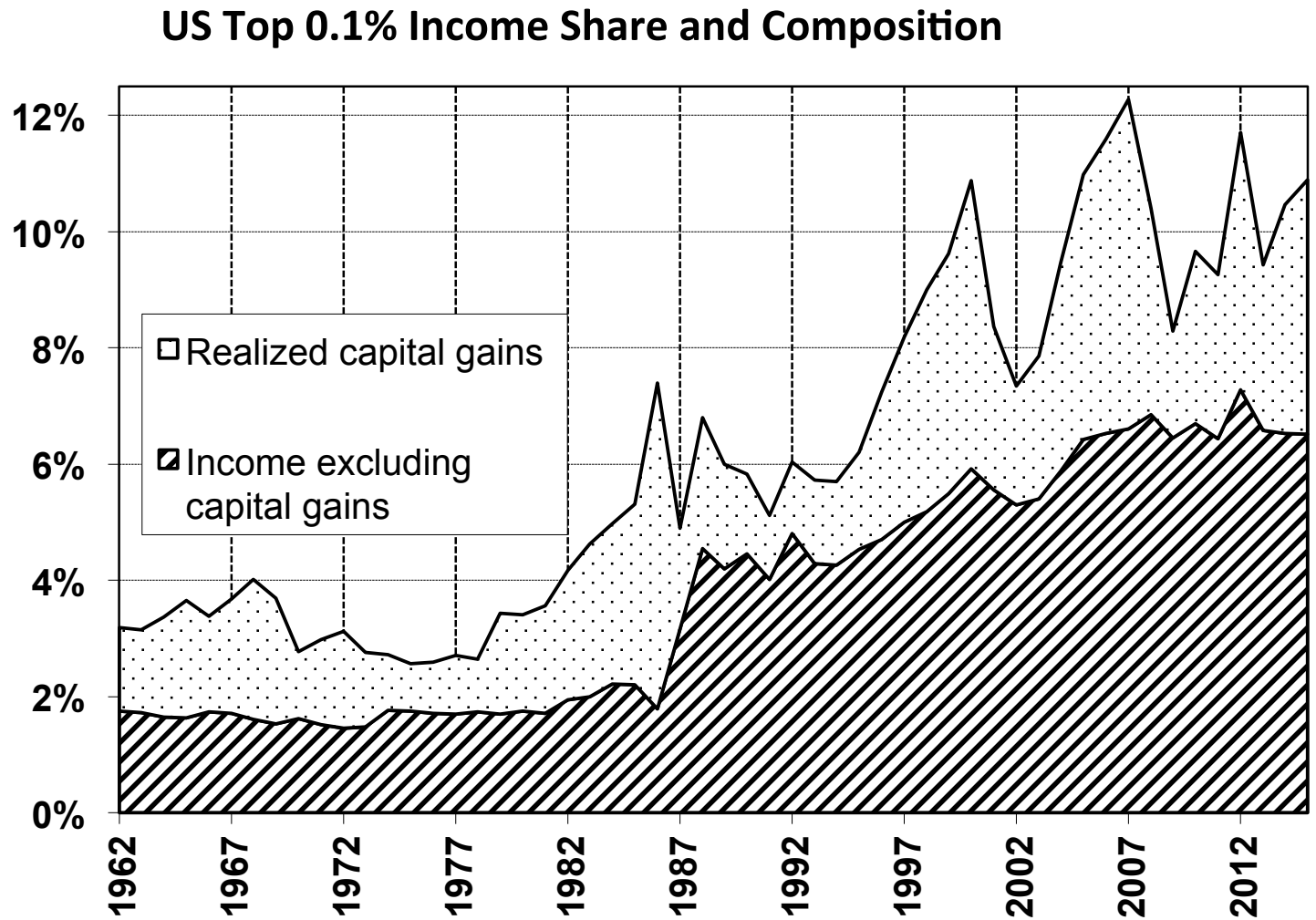
⇒ Surge in capital gains realizations in 1986 and 2012 [and depressed capital gains in 1987 and 2013]

⇒ Short-term elasticity is very large but long-term elasticity is certainly much smaller

Top 1% pre-tax income share and top tax rates



Source: Top 1% income share: Piketty and Saez, 2003 updated to 2015, series including realized capital gains. Top MTR include Federal individual tax + uncapped FICA payroll tax.



Source: Piketty and Saez, 2003 updated to 2015. Series based on pre-tax cash market income including realized capital gains, and always excluding government transfers.

Income Shifting

Corporate vs. Individual Tax Base

Businesses can be organized as **corporations** or **unincorporated businesses** [also called **pass-through** entities]

Corporate profits first taxed by corporate tax [rate $\tau_c = 21\%$]

Net-of-tax profits are taxed again at rate τ_{distrib} when finally distributed to shareholders. Two distribution options:

a) dividends [tax rate $\tau_d = 20\%$ today]

b) retained profits increase stock price: shareholders realize capital gains when finally selling the stock [tax rate $\tau_{cg} = 20\%$]

But distributions can be deferred so that $\tau_{\text{distrib}} << \tau_d, \tau_{cg}$

For **unincorporated businesses** (sole proprietorships, partnerships, S-corporations) profits are taxed directly and solely as individual income (tax rate $\tau_i = 37\%$ top MTR or even 30% with 20% business profit deduction since 2018)

CORPORATE AND INDIVIDUAL TAX BASE

Corporate form best if $(1-\tau_c)\cdot(1-\tau_{\text{distrib}}) > 1-\tau_i$

US fed taxes in 2018+: $\tau_c = 21\%$, $\tau_{cg} = \tau_d = 20\%$, (but $\tau_{\text{distrib}} << 20\%$ if distribution deferred), $\tau_i = 37\%$ or 30%

After 2018 Trump tax cut: corporate form is best, especially if wealthy business owner can defer distribution

Pre 2018, $\tau_c = 35\%$ and $\tau_i = 39.6\% \Rightarrow$ individual form better

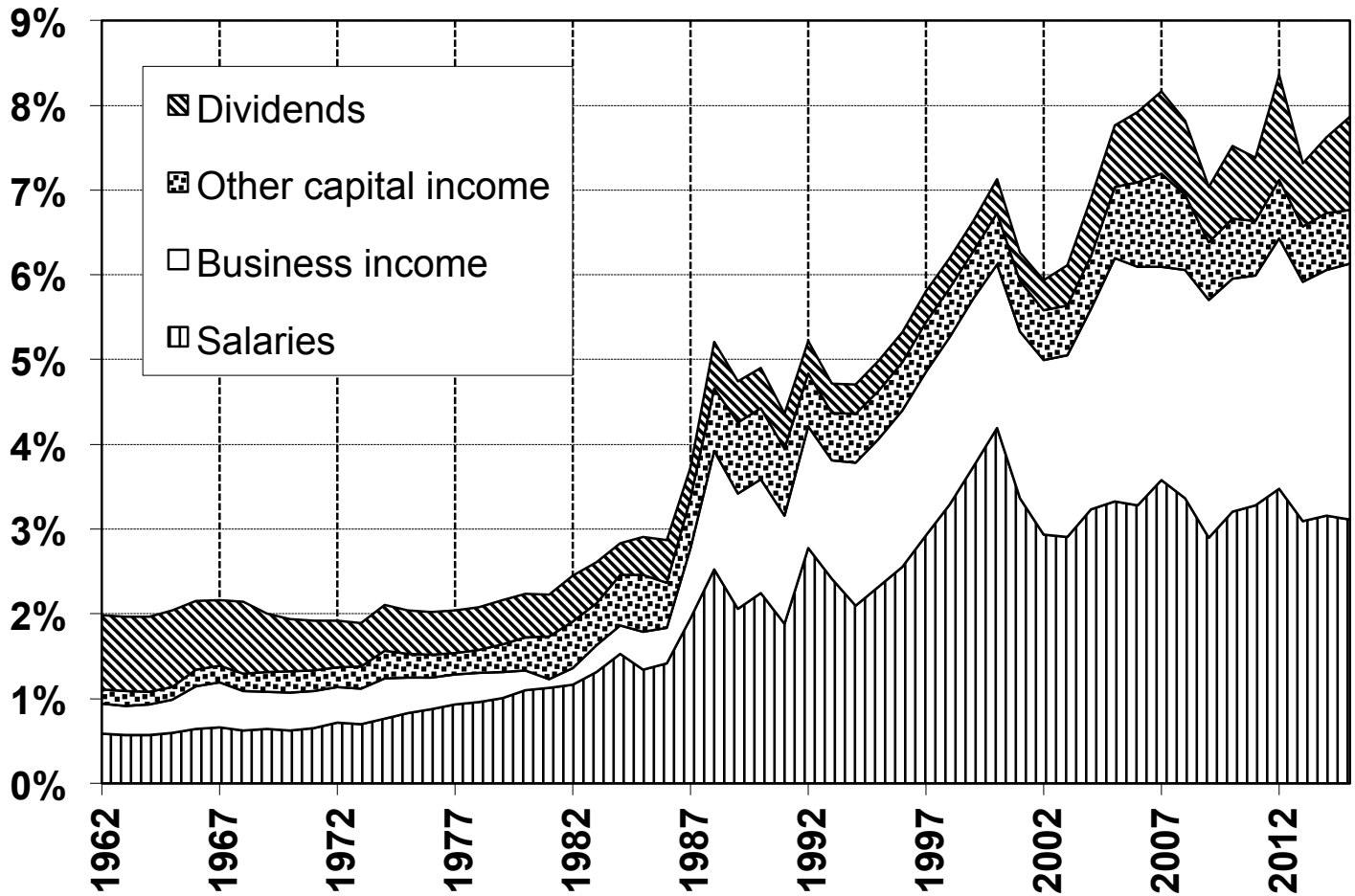
$\Rightarrow$ wealthy people likely to incorporate their businesses in '18+

Before TRA'86 (and especially before ERTA'81), top individual rate τ_i was much higher so corporate form was best

Shifts from corporate to individual base increases business profits at the expense of dividends and realized capital gains

Large part of TRA'86 response is due to such shifting

US Top 0.1% Income Share and Composition (excl. K gains)



Source: Piketty and Saez, 2003 updated to 2015. Series based on pre-tax cash market income ex cluding realized capital gains, and always excluding government transfers.

Bottom Line on Behavioral Responses to Taxes

1) Clear evidence of strong responses to tax changes due to re-timing or income shifting

2) Heterogeneity in tax responses due to heterogeneity in shifting opportunities [e.g., Kennedy tax cuts of '61 vs. TRA'86]

3) Top income shares can change drastically without changes in tax rates [e.g., 1993-2000]

4) Difficult to know from single country time series the role played by top tax rate cuts in the surge of top incomes

$\Rightarrow$ International evidence can cast further useful evidence

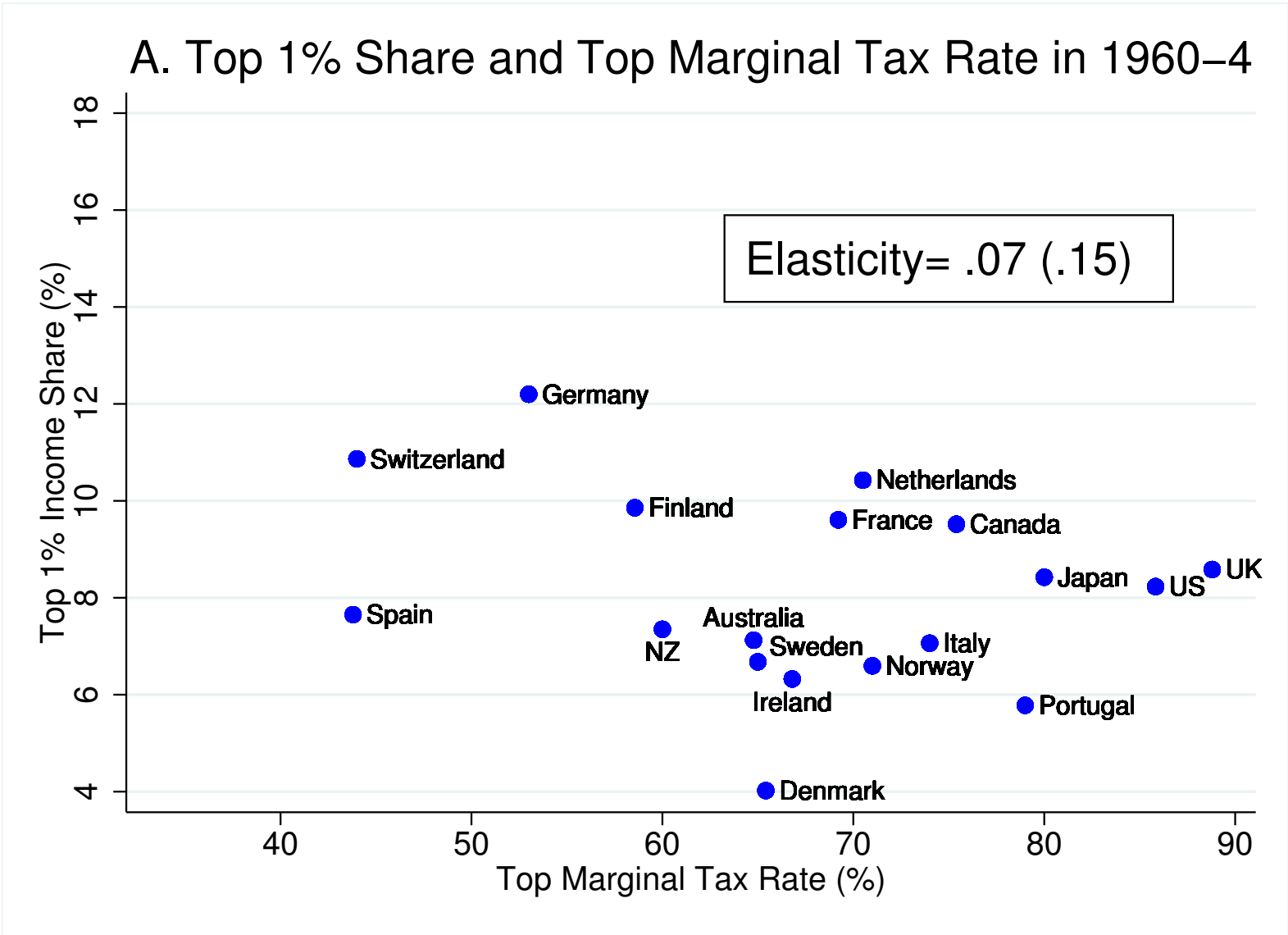
TOP RATES AND TOP INCOMES

INTERNATIONAL EVIDENCE

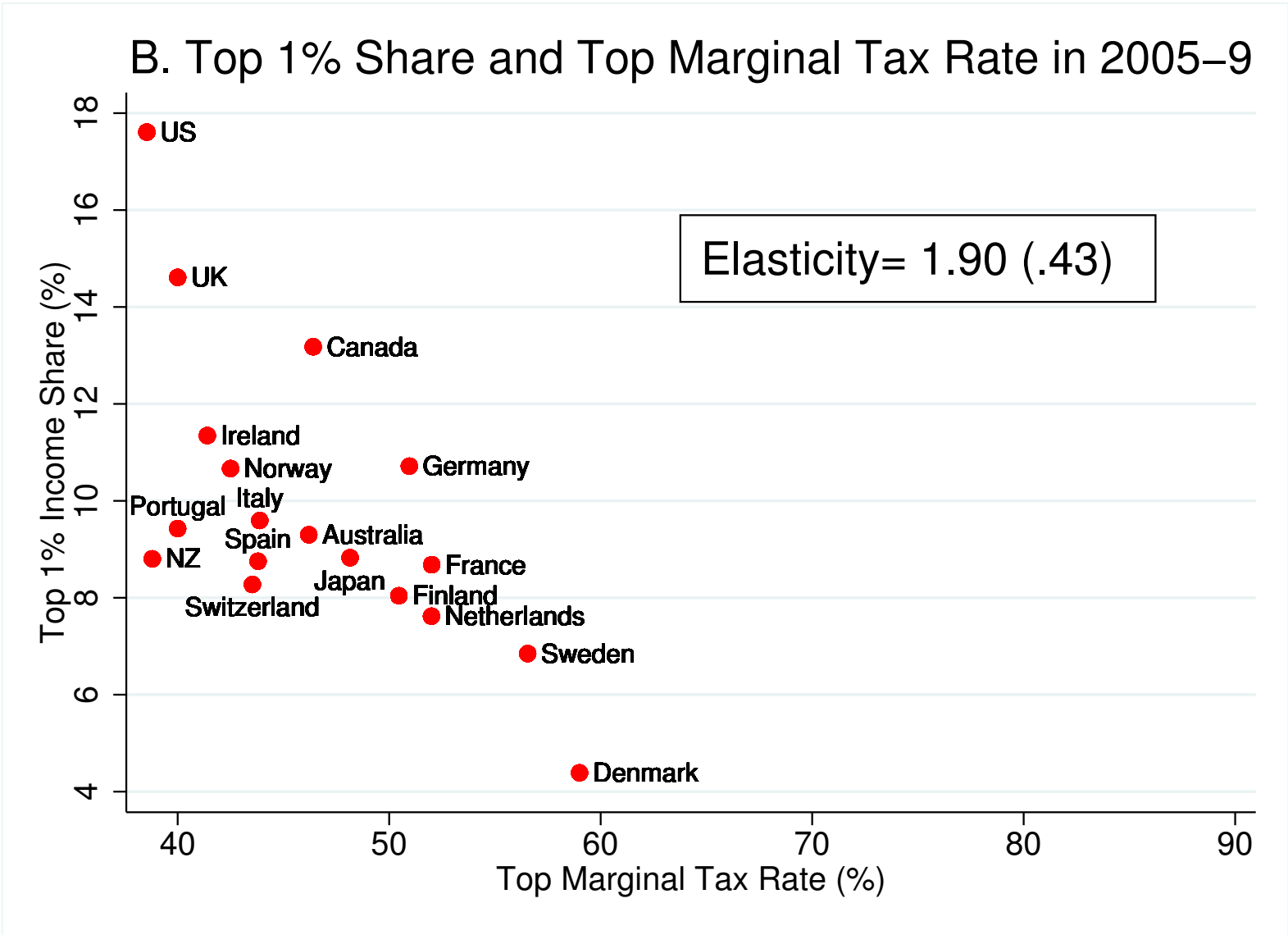
1) Use pre-tax top 1% income share data from 18 OECD countries since 1960 using the **World Top Incomes Database**

2) Compute top (statutory) individual income tax rates using OECD data [including both central and local income taxes]

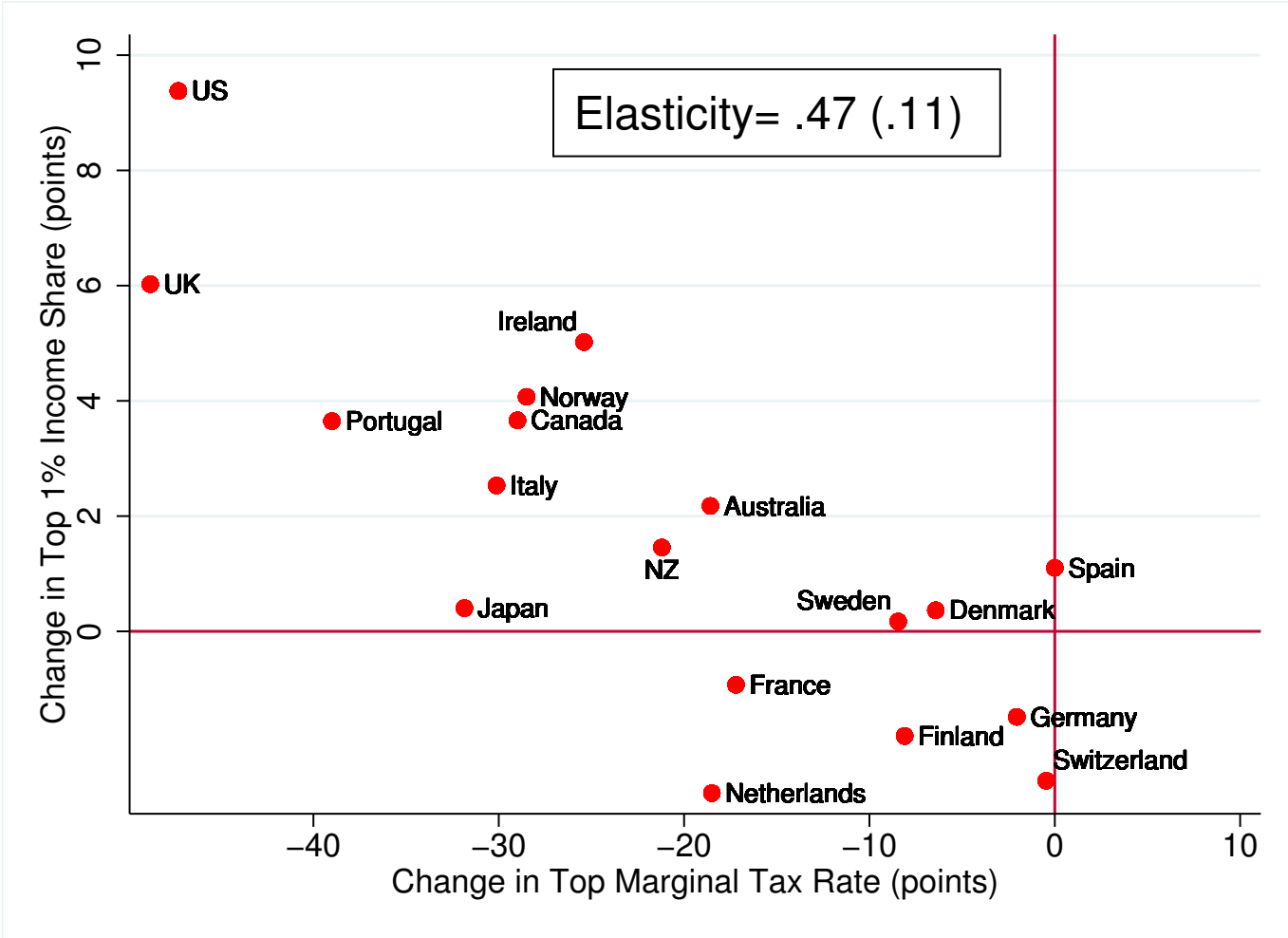
Plot top 1% pre-tax income share against top MTR in 1960-4, in 2005-9, and 1960-4 vs. 2005-9



Source: Piketty, Saez, Stantcheva AEJ-EP (2014)



Source: Piketty, Saez, Stantcheva AEJ-EP (2014)



Change in Top Tax Rate and Top 1% Share, 1960-4 to 2005-9

Source: Piketty, Saez, Stantcheva AEJ-EP (2014)

TOP RATES AND TOP INCOMES EVIDENCE

1) Pre-tax Top income shares have increased significantly in some but not all countries [Atkinson-Piketty-Saez JEL'11]

2) Top tax rates have come down significantly in a number of countries since 1960s

3) Correlation between 1) and 2) is strong but not perfect: lower top tax rates are a necessary but not sufficient condition for surge in top incomes

ECONOMIC EFFECTS OF TAXING THE TOP 1%

Strong evidence that **pre-tax** top incomes are affected by top tax rates

3 potential scenarios with very different policy consequences:

1) **Supply-side:** Top earners work less and earn less when top tax rate increases
   ⇒ Top tax rates should not be too high

2) **Tax Avoidance/Evasion:** Top earners avoid/evade more when top tax rate increases
   ⇒ a) Eliminate loopholes, b) Then increase top tax rates

3) **Rent-seeking:** Top earners extract more pay (at the expense of the 99%) when top tax rates are low
   ⇒ High top tax rates are desirable

Real changes or Tax avoidance? Charitable giving

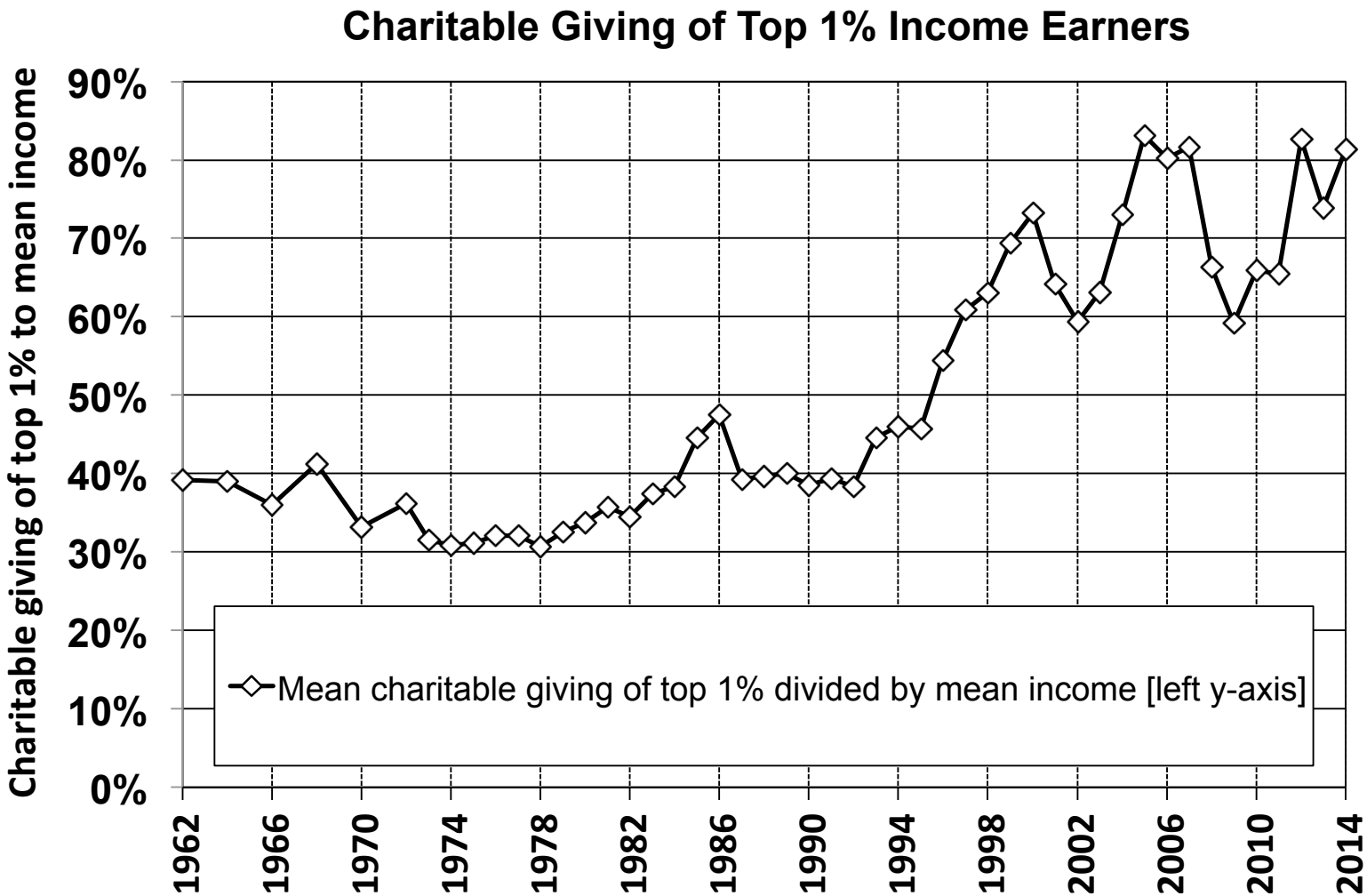
(Saez TPE'17)

Correlation between **pre-tax** top incomes and top tax rates

Test using charitable giving behavior of top income earners (Saez'17)

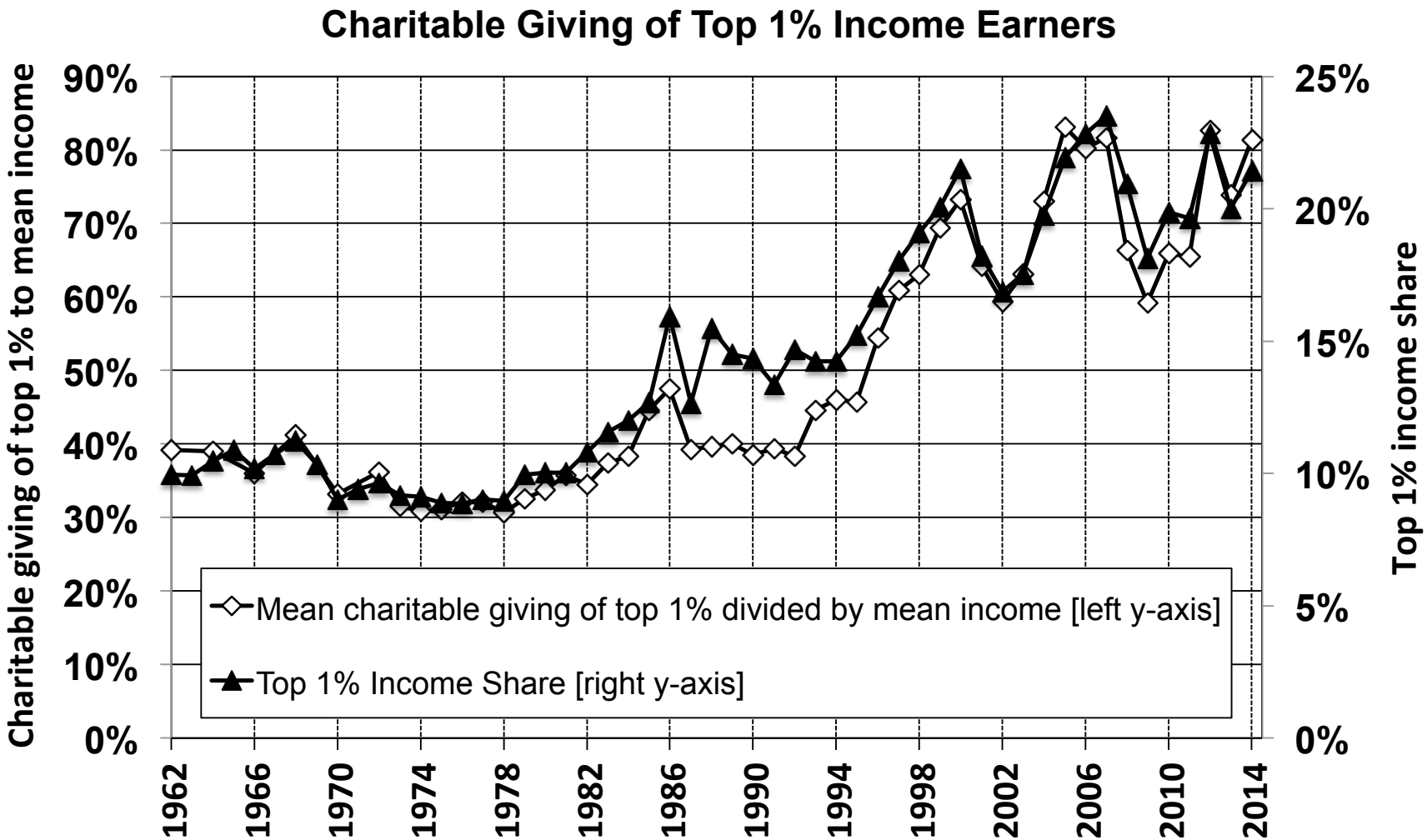
- Because charitable is tax deductible, incentives to give are stronger when tax rates are higher
- Under the tax avoidance scenario, reported incomes and reported charitable giving should move in opposite directions
- Empirically, charitable giving of top income earners has grown in close tandem with top incomes

$\Rightarrow$ Incomes at the top have grown for real (i.e., pure tax avoidance scenario unlikely)



Source: The figure depicts average charitable giving of top 1% incomes (normalized by average income per family) on the left y-axis.

Source: Saez TPE 2017



Source: The figure depicts average charitable giving of top 1% incomes (normalized by average income per family) on the left y-axis. For comparison, the figure reports the top 1% income share (on the right y-axis).

Source: Saez TPE 2017

Supply-side or Rent-seeking?

(Piketty-Saez-Stantcheva AEJ'13)

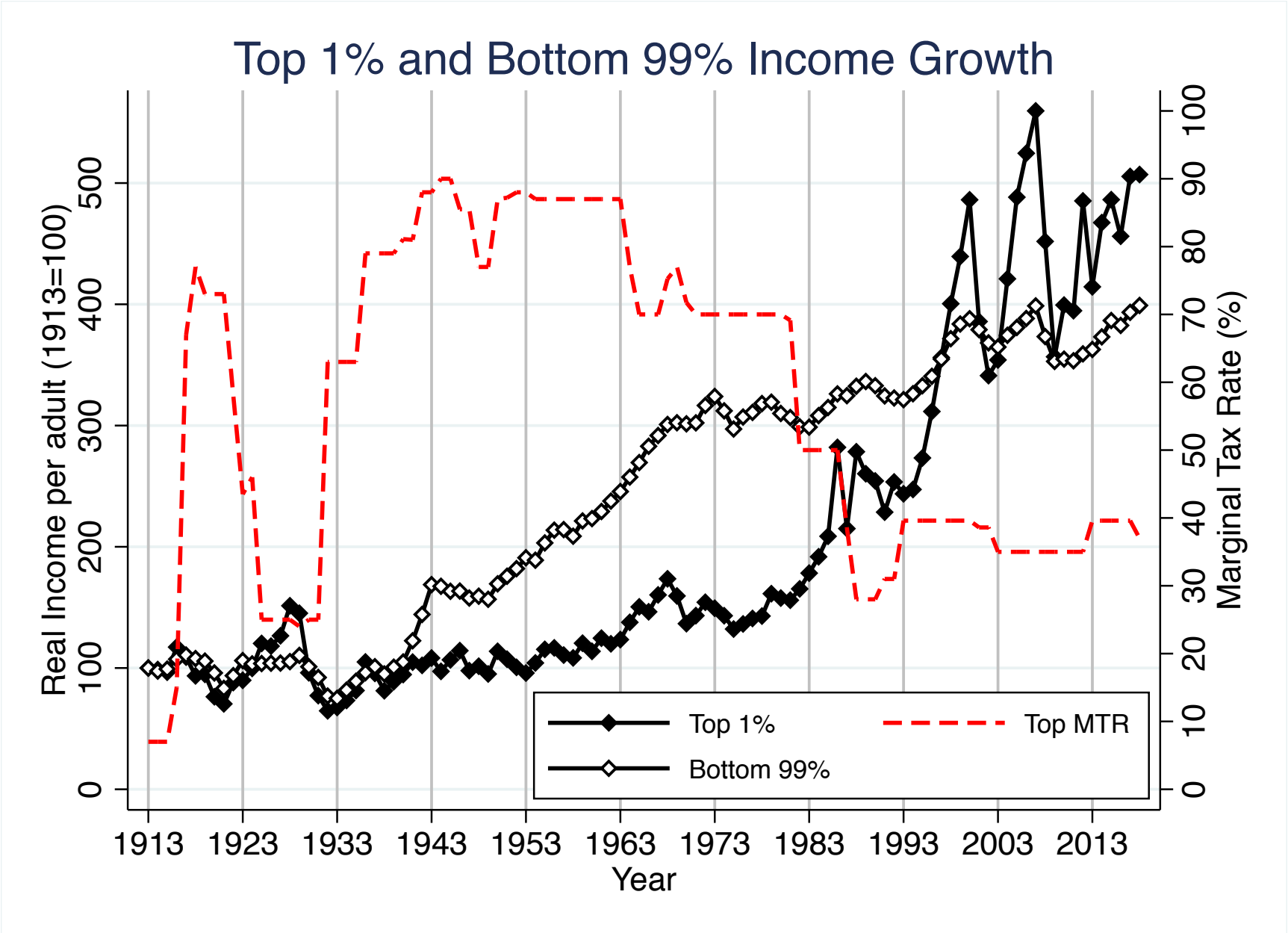
Correlation between **pre-tax** top incomes and top tax rates

If rent-seeking: growth in top 1% incomes should come at the expense of bottom 99% (and conversely)

- Two macro-preliminary tests:

  1) In the US, top 1% incomes grow slowly from 1933 to 1975 and fast afterwards. Bottom 99% incomes grow fast from 1933 to 1975 and slowly afterwards $\Rightarrow$ Consistent with rent-seeking effects
  2) Look at cross-country correlation between economic growth and top tax rate cuts $\Rightarrow$ No correlation supports rent-seeking

- One micro-test using CEO pay data

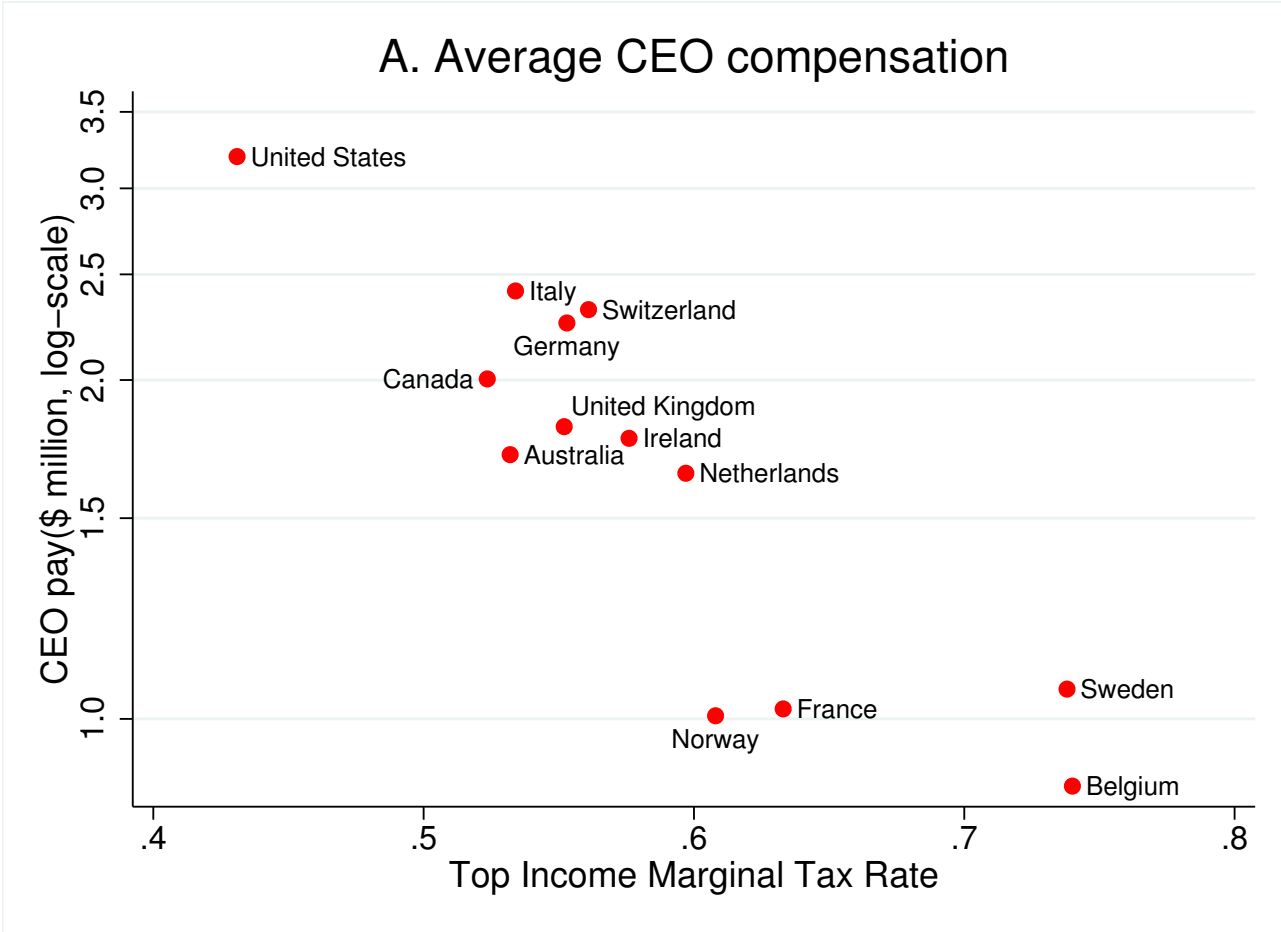

Top 1% and Bottom 99% Income Growth
Real Income per adult (1913=100)
0
100
200
300
400
500
Marginal Tax Rate (%)
0
10
20
30
40
50
60
70
80
90
100
1913
1923
1933
1943
1953
1963
1973
1983
1993
2003
2013
Year
Top 1%
Bottom 99%
Top MTR

INTERNATIONAL CEO PAY EVIDENCE

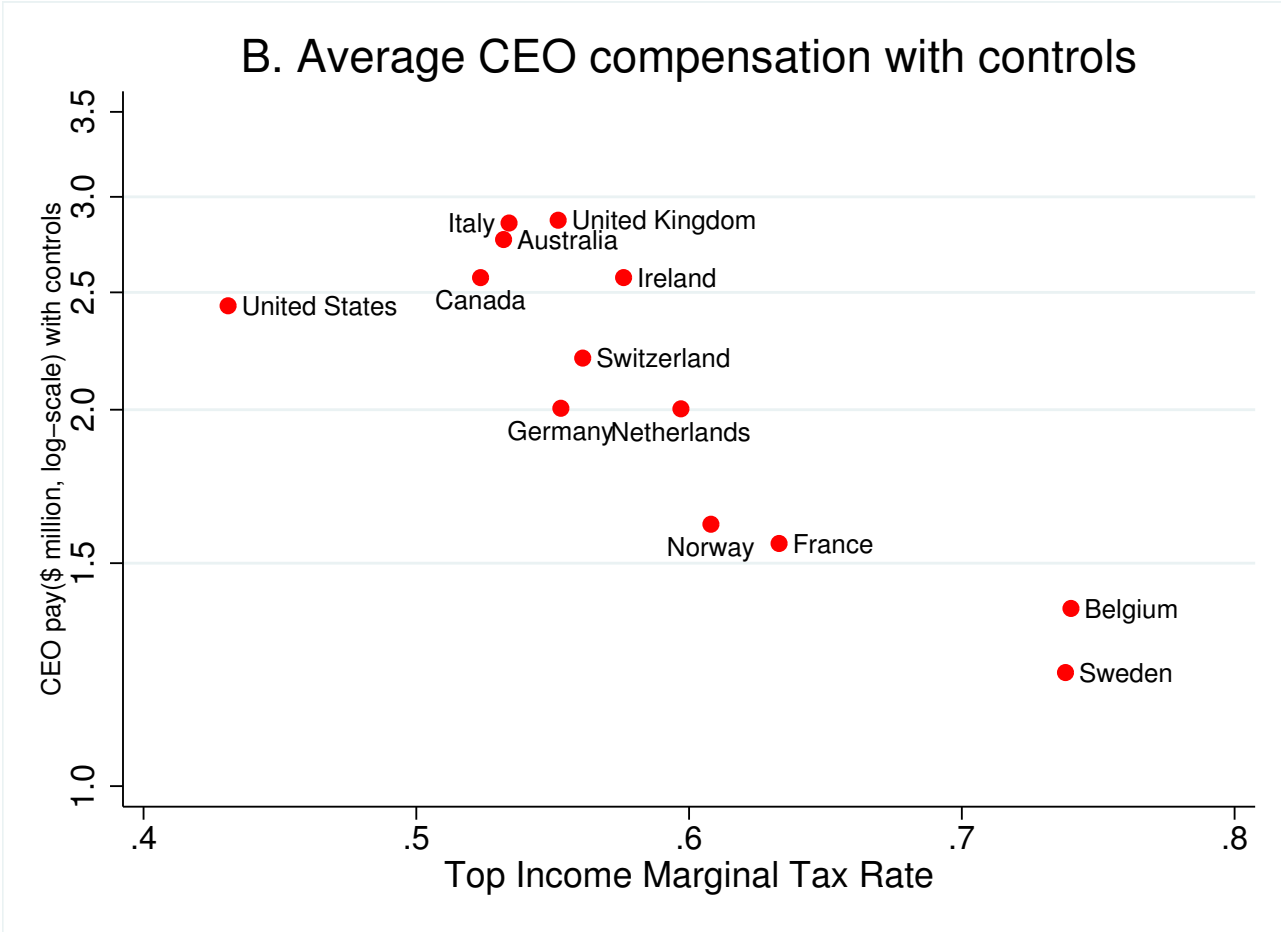
Recent micro-data for 2006 gathered by Fernandes, Ferreira, Matos, Murphy RFS'13.

1) CEO pay across countries strongly negatively correlated with top tax rates
2) Correlation remains as strong even when controlling for firms' characteristics and performance

$\Rightarrow$ Consistent with rent-seeking effects



Link between top tax rate and CEO pay in 2006 across countries



Controlling for firm profitability, governance, size, and industry

UK OWNER-MANAGERS

(Miller-Pope-Smith, 2019)

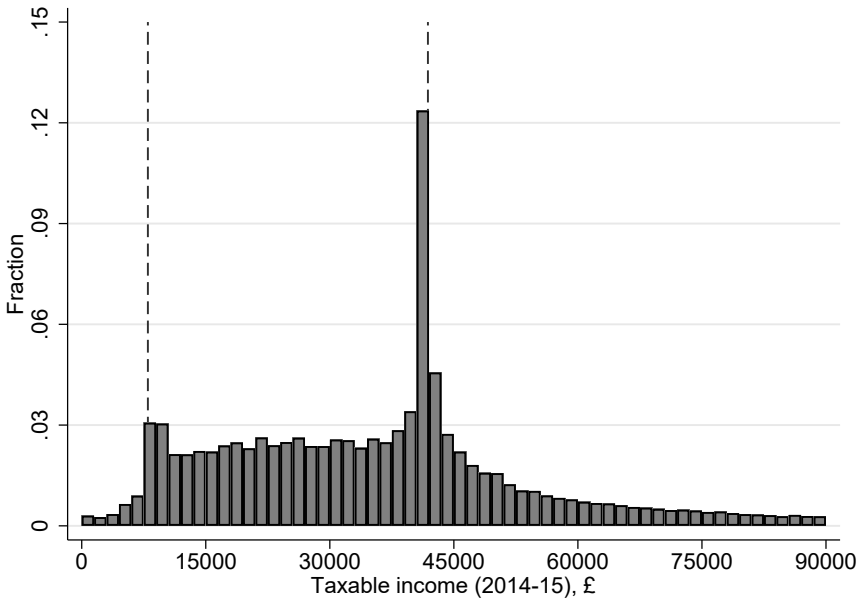
Use linked **UK tax records** to estimate how personal taxes affect the behaviour of company owner-managers (read Section 3!)

Two empirical strategies: (1) bunching at 'higher rate' kink (MTR goes from 20% to 40%); (2) diff-in-diff of policy reform that increased MTR above £100k (since 2010-11)

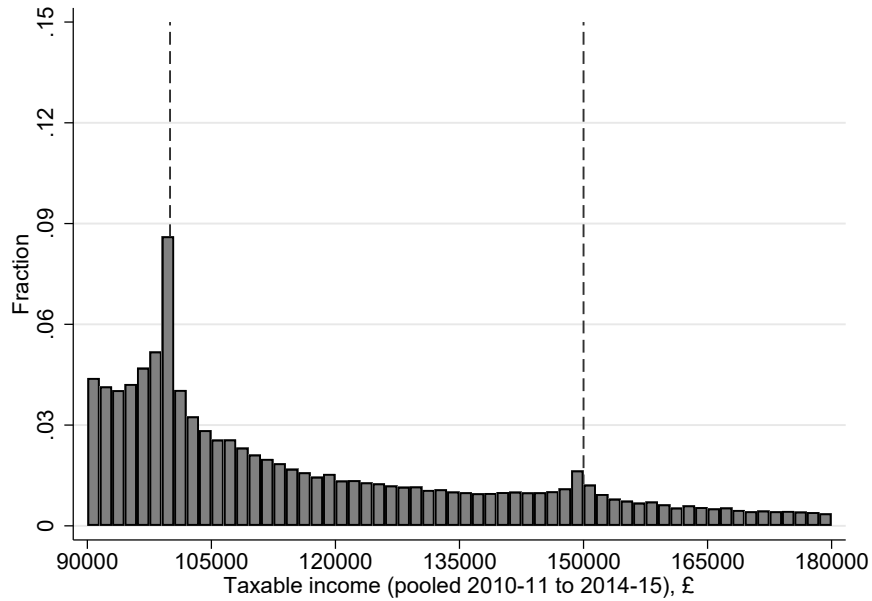
- Responses to MTRs are in line with **intertemporal income shifting**, and not to reductions in real business activity
- Taxable income is shifted across time to (i) smooth income that fluctuates around tax kinks and (ii) to access preferential capital gains tax rates (20% in higher-rate band)
- Also find large tax-induced retained profits; held as cash and equivalent assets $\Rightarrow$ do not lead to higher investment in capital

Figure 3.2: *Distribution of taxable income for company owner-managers*

(a) Income $\leq$ £90,000 (2014-15)



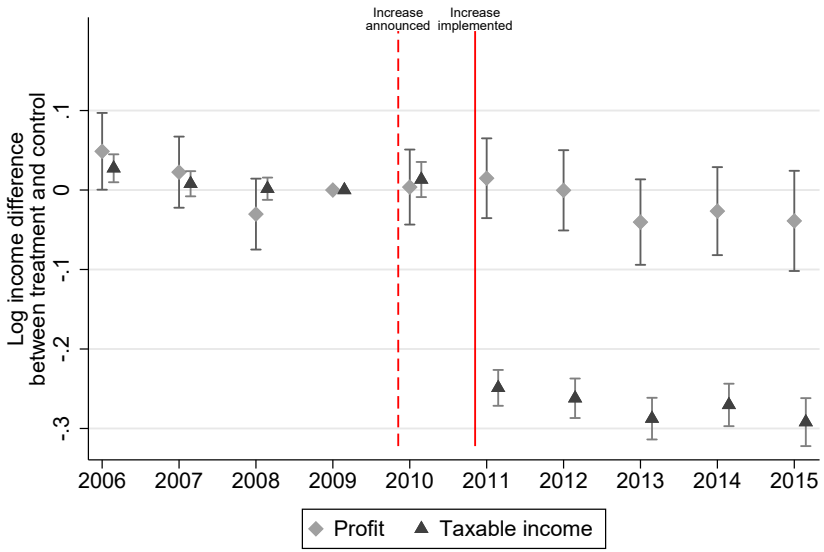
(b) Income > £90,000 (2010-11–2014-15)



Source: Miller, Pope, Smith (2019)

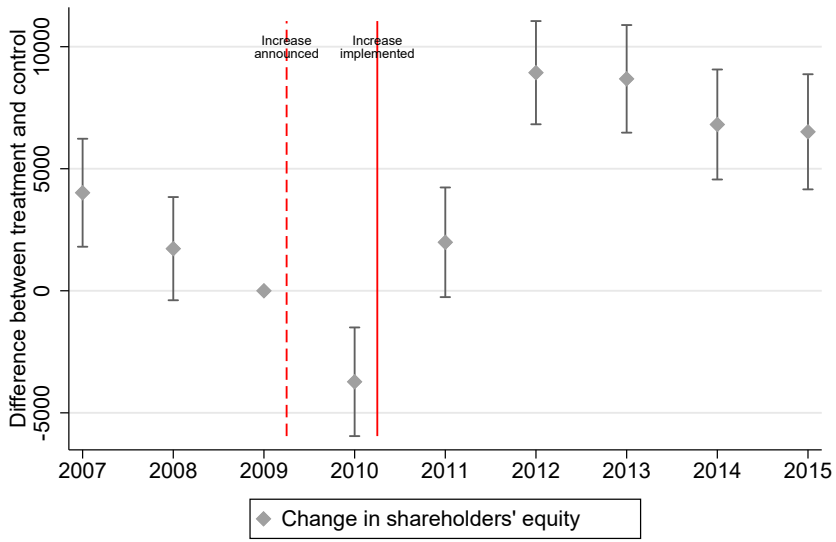
Figure 5.5: *Coefficients from differences-in-differences specification*

(a) Taxable income and profit



Treatment definition: taxable income between 95000 and 200000.
Control definition: taxable income between 50000 and 95000.

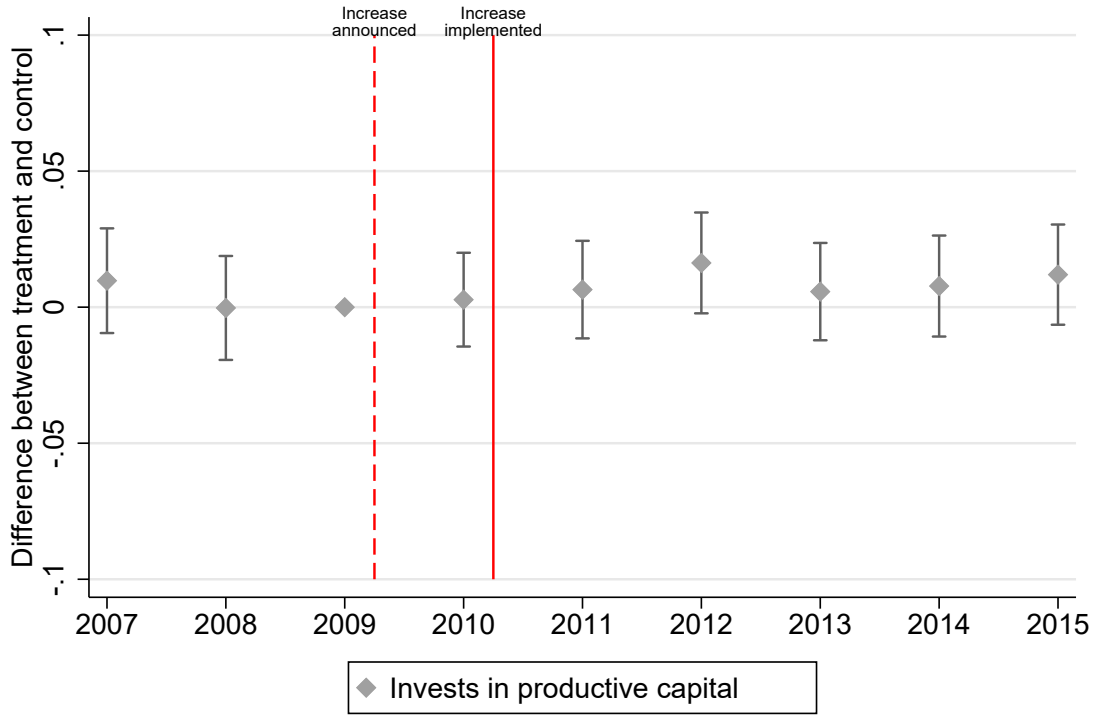
(b) Shareholder's equity



Treatment definition: taxable income between 95000 and 200000.
Control definition: taxable income between 50000 and 95000.

Source: Miller, Pope, Smith (2019)

Figure 5.8: *Coefficient estimates from differences-in-differences specification, investment*



Treatment definition: taxable income between 95000 and 200000.
Control definition: taxable income between 50000 and 95000.

INTERNATIONAL MIGRATION

Public debate concern that top skilled individuals move to low tax countries (e.g., in EU) or low tax states (US). Migration concern bigger in public debate than supply-side concern within a country

Optimal top tax rate with migration elasticity of top earners (η_m) and intensive elasticity (e) is: $\tau^* = 1/(1 + a \cdot e + \eta_m)$

$\Rightarrow$ The possibility of migration from top earners can decrease significantly the ability of EU countries to tax high incomes

Interesting variation due to proliferation of special low tax schemes for highly paid foreigners in Europe:

$\Rightarrow$ Kleven et al AER'13 look at **football players** in Europe (highly mobile group, many tax reforms) $\Rightarrow$ Find significant migration responses to taxes after European football market was de-regulated in '95

$\Rightarrow$ Akcigit-Baslandze-Stantcheva AER'16 look at **innovators** (using patent data) mobility and find significant tax effects for top innovators

US states: Moretti-Wilson AER'17 '19, Rauh-Shyu '19

Kleven-Landais-Saez-Schultz QJE'14

Exploit the 1991 tax scheme in Denmark: immigrants with high earnings ($\geq 103,000$ Euros/year) taxed at flat 25% rate (instead of regular tax with top 59% rate) for 3 years

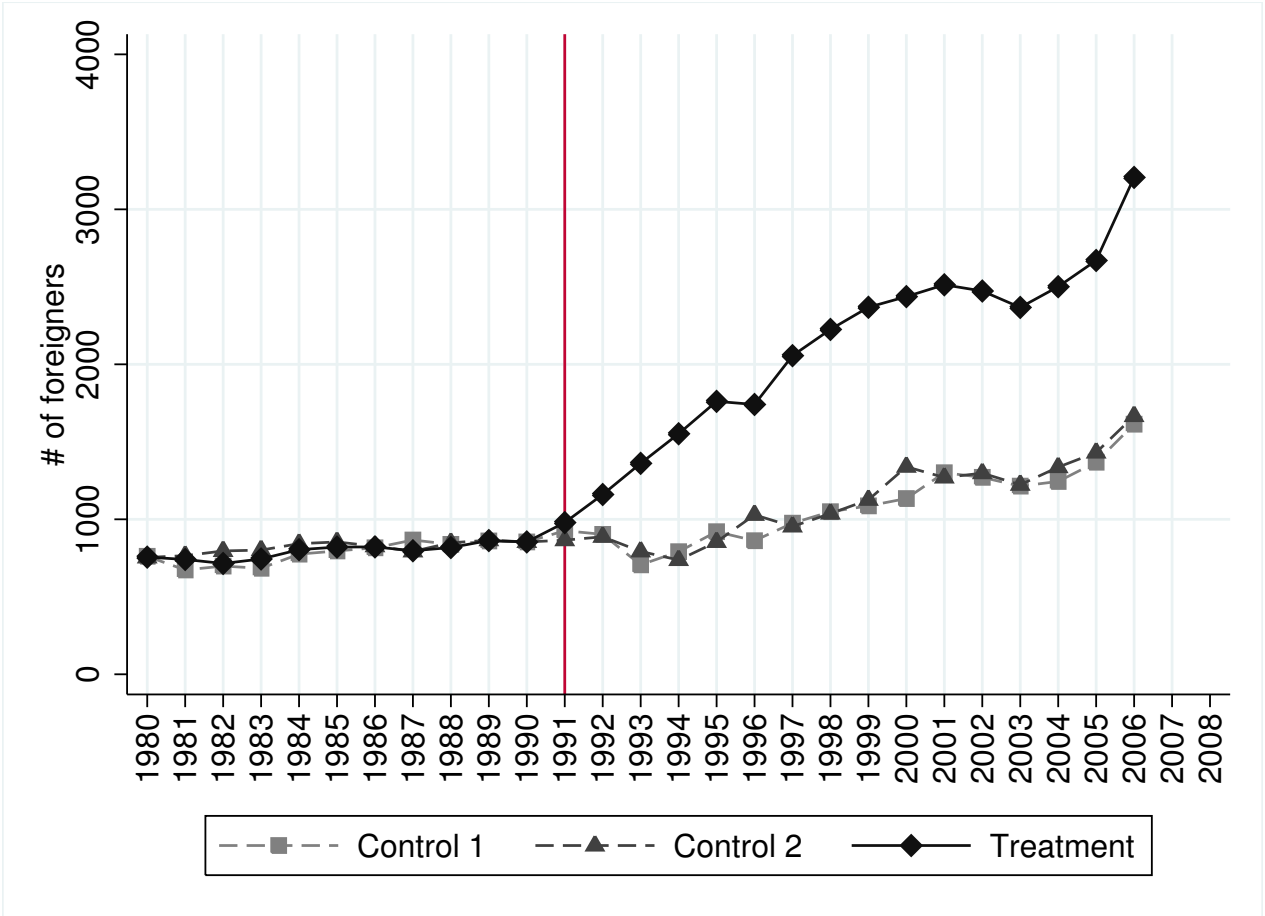
Use population wide Danish tax data and DD strategy: compare immigrants above eligibility earnings threshold (treatment) to immigrants slightly below threshold (control)

Key finding: Scheme doubles the number of highly paid foreigners in Denmark relative to controls

$\Rightarrow$ Elasticity of migration with respect to the net-of-tax rate above one (much larger than the within country elasticity of earnings)

$\Rightarrow$ Tax coordination will be key to preserve progressive taxation in the European Union

Figure 3: Total number of foreigners in different income groups



Control 1= annualized income between .8 and .9 of threshold
Control 2= annualized income between .9 and .995 of threshold.

Kleven, Landais, Saez, Schultz QJE (2014)

ETI AS A POLICY INSTRUMENT

The ETI is not a **structural parameter**. It depends on avoidance and evasion, which depend on the tax and enforcement system (Slemrod and Kopczuk, 2002)

The ETI will be low under (i) a **broad tax base** that offers limited opportunity for income shifting, (ii) **rigorous tax enforcement** that offers limited opportunity for evasion

If the ETI is very high (Laffer rate very low), what is the best policy response? (i.e., when people are very responsive to income tax)

Two possibilities: (i) reduce the MTR, (ii) reduce the ETI.
Optimal policy depends on the marginal costs/benefits of (i) and (ii).

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