

230B: Public Economics  
Taxable Income Elasticities

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## **TAXABLE INCOME ELASTICITIES**

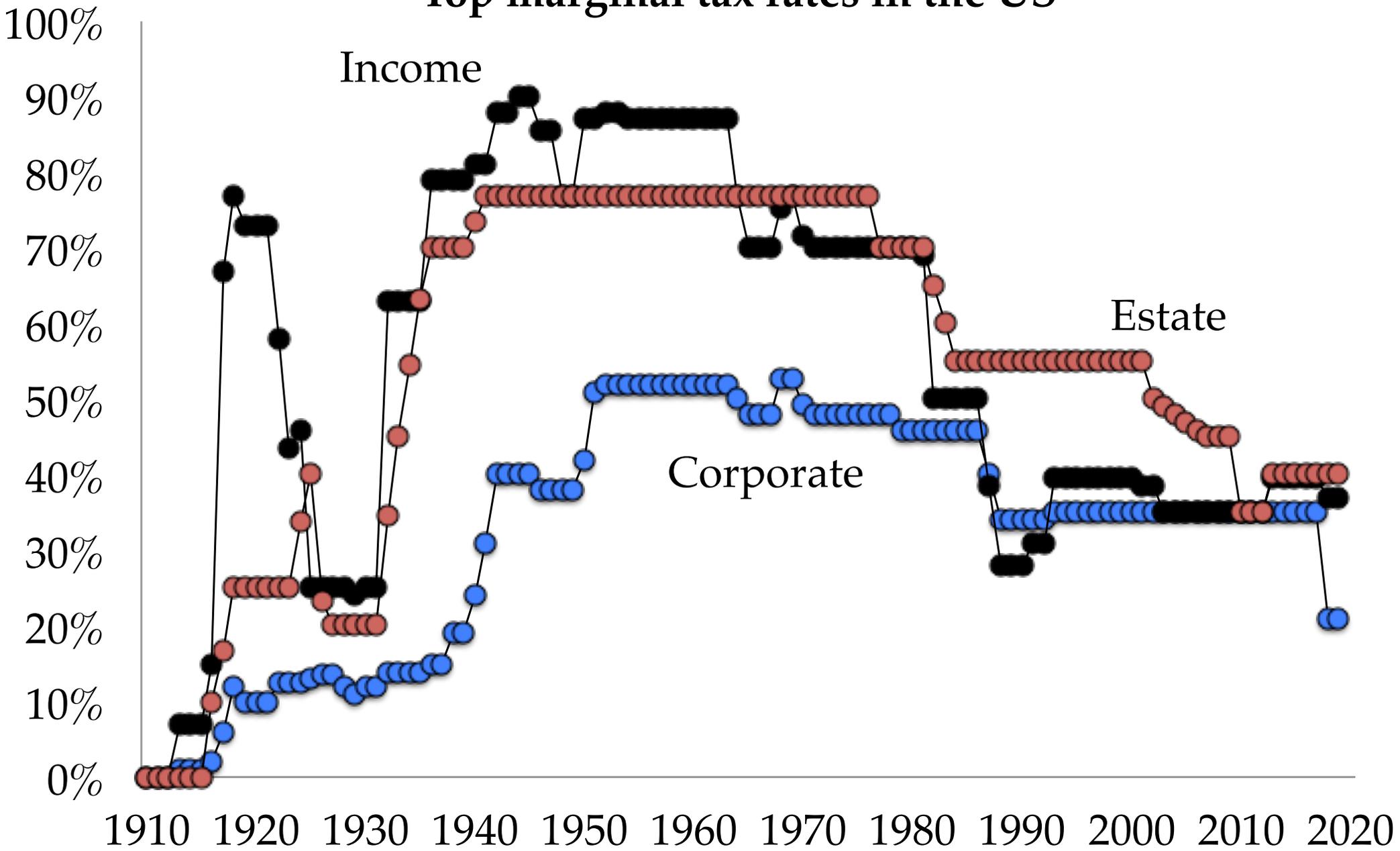
Modern public finance literature focuses on taxable income elasticities instead of hours/participation elasticities

Two main reasons:

- 1) What matters for efficiency 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 this literature: Saez-Slemrod-Giertz JEL'12

# Top marginal tax rates in the US



## LONG-RUN EVIDENCE IN THE US

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

Focus is on **pre-tax income** before deductions and excluding realized capital gains

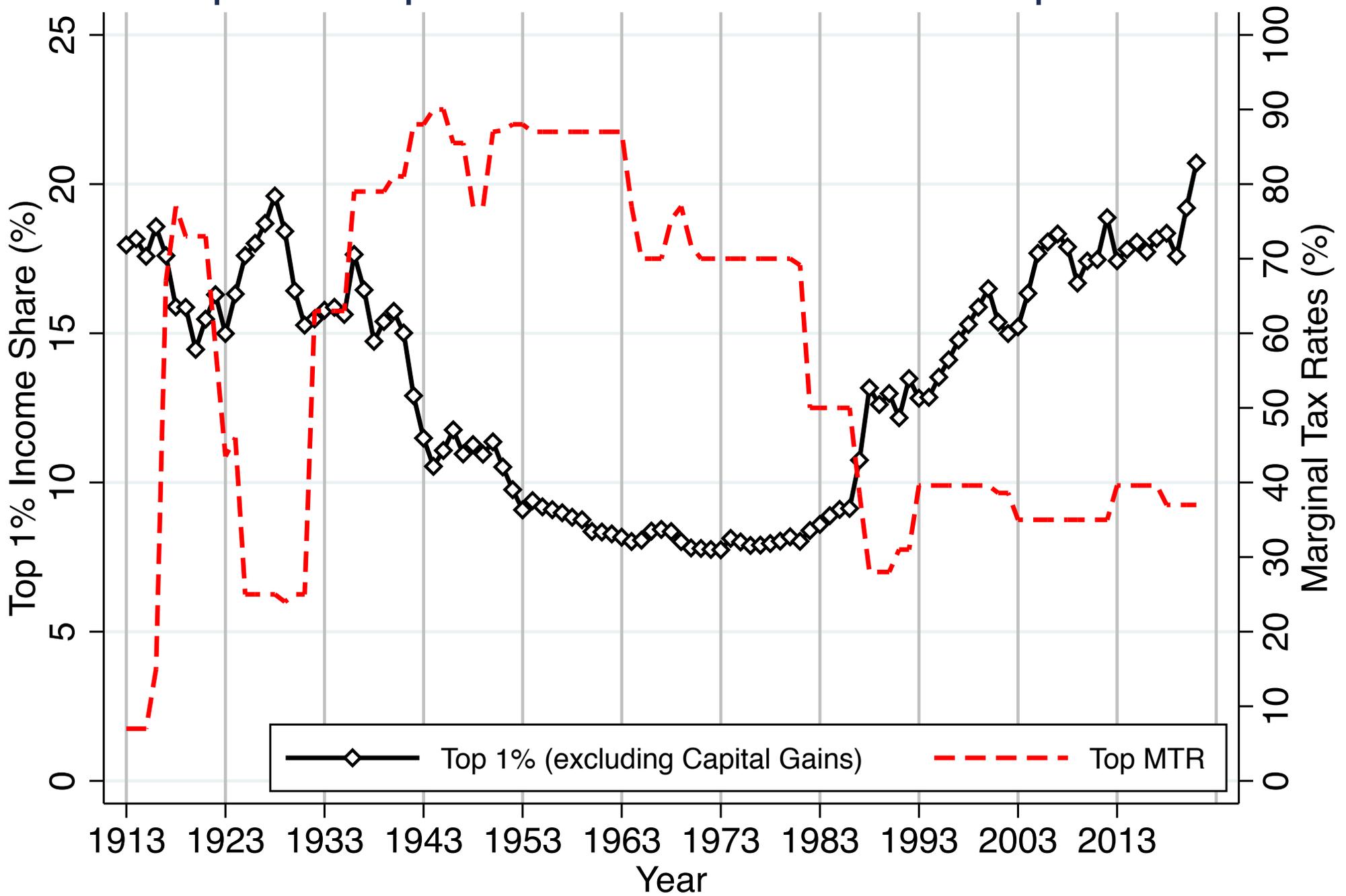
Pioneered by Feenberg-Poterba TPE'93 for period 1951-1990

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

Saez TPE'04 proposes detailed analysis for 1960-2000 period using TAXSIM calculator at NBER linked to IRS micro-files

Piketty-Saez-Stantcheva AEJ'14 look at 1913-2010 period for the US

# Top 1% Reported Income Share and Top 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 top income share and  $\tau_t$  is the average MTR for top group

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

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

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

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

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

**Table 1.**  
**Elasticity estimates using top income share time series**

	Top 1%	Next 9%
	(1)	(2)
<b>A. Tax Reform Episodes</b>		
1981 vs. 1984 (ERTA 1981)	0.60	0.21
1986 vs. 1988 (TRA 1986)	1.36	-0.20
1992 vs. 1993 (OBRA 1993)	0.45	
1991 vs. 1994 (OBRA 1993)	-0.39	
<b>B. Full Time Series 1960-2006</b>		
No time trends	1.71 (0.31)	0.01 (0.13)
Linear time trend	0.82 (0.20)	-0.02 (0.02)
Linear and square time trends	0.74 (0.06)	-0.05 (0.03)
Linear, square, and cube time trends	0.58 (0.11)	-0.02 (0.02)

Notes: Estimates in panel A are obtained using series from Figure 1 and using the formula  $e = [\log(\text{income share after reform}) - \log(\text{income share before reform})] / [\log(1 - \text{MTR after reform}) - \log(1 - \text{MTR before reform})]$

Source: Saez et al. (2010)

Estimates in Panel B are obtained by time-series regression of  $\log(\text{top 1\% income share})$  on a constant,  $\log(1 - \text{average marginal tax rate})$ , and polynomials time controls from 1960 to 2006 (44 observations). OLS regression. Standard Errors from Newey-West with 8 lags.

## LONG-RUN EVIDENCE IN THE US

- 1) Clear correlation between top incomes and top income rates both in several short-run tax reform episodes and in the long-run [but hard to assess long-run tax causality]
  - 2) Correlation largely absent below the top 1% (such as the next 9%)
  - 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 not due to a universal labor supply elasticity

## SPECIFIC TAX REFORM STUDIES

Literature initially developed by analyzing specific tax reforms (instead of full time series)

Lindsey JpubE'87 analyzes ERTA'81 using **repeated cross-section** tax data and finds large elasticities

Feldstein JPE'95 uses **panel** tax data to study TRA'86

Goolsbee JPE'00 uses **executive compensation** data to study OBRA'93

Gruber-Saez JpubE'02 uses 1979-1990 **panel** tax data

Saez TPE'17 uses income share to study 2013 top tax rate increase

Many other studies in the US and abroad (survey by Saez-Slemrod-Giertz JEL'12)

## GRUBER AND SAEZ JPUBE'02 (skip)

Use panel data from 1979-1990 on all tax changes available rather than a single reform

**Model:**  $z_{it} = z_{it}^0 \cdot (1 - \tau_{it})^e$  where  $z_{it}^0$  is potential income (if MTR=0),  $e$  is elasticity

$$\log \left( \frac{z_{it+3}}{z_{it}} \right) = \alpha + e \cdot \log \left( \frac{1 - \tau_{it+3}}{1 - \tau_{it}} \right) + \varepsilon_{it}$$

$\tau_{it+3}$  and  $\varepsilon_{it}$  are correlated [because  $\tau_{it+3} = T'_{t+3}(z_{it+3})$ ]

**Instrument:** predicted change in MTR assuming income stays constant:  $\log[(1 - \tau_{it+3}^p)/(1 - \tau_{it})]$  where  $\tau_{it+3}^p = T'_{t+3}(z_{it})$

Isolates changes in tax law ( $T_t(\cdot)$ ) as the only source of variation in tax rates

Table 4  
 Basic elasticity results<sup>a</sup>

Income controls	None		Log income		Log income 10-piece spline	
	Broad income (1)	Taxable income (2)	Broad income (3)	Taxable income (4)	Broad income (5)	Taxable income (6)
Elasticity	-0.300 (0.120)	-0.462 (0.194)	0.170 (0.106)	0.611 (0.144)	0.120 (0.106)	0.400 (0.144)
Dummy for marrieds	-0.008 (0.010)	-0.062 (0.018)	0.045 (0.014)	0.049 (0.023)	0.050 (0.012)	0.055 (0.021)
Dummy for singles	-0.037 (0.012)	-0.053 (0.019)	-0.034 (0.013)	-0.032 (0.022)	-0.036 (0.013)	-0.027 (0.021)
Log(income) control			-0.083 (0.015)	-0.167 (0.021)		

Source: Gruber and Saez 2002

## GRUBER AND SAEZ JPUBE'02 (skip)

Find an elasticity of roughly 0.3-0.4 BUT results are very fragile [Saez-Slemrod-Giertz JEL'12]

- 1) Sensitive to exclusion of low incomes
- 2) Sensitive to controls for mean reversion
- 3) Subsequent studies find smaller elasticities using data from other countries [Kleven-Schultz AEJ-EP'14 for Denmark]
- 4) Bundles together small tax changes and large tax changes: if individuals respond only to large changes in short-medium run, then estimated elasticity is too low [Chetty et al. QJE'11]

# TAX AVOIDANCE AND FISCAL EXTERNALITIES

Tax avoidance responses often generate **fiscal externalities**

A **Fiscal externality** is a change in tax revenue that occurs in any tax base  $z^B$  other than  $z$  due to the behavioral response to the tax change in the initial base  $z$

(1)  $z^B$  can be a different tax base in the same time period (such as corporate income tax base)  $\Rightarrow$  **Income shifting**

(2)  $z^B$  can be the same tax base in a different time period (such as future income)  $\Rightarrow$  **Inter-temporal Substitution**

Efficiency and optimal tax analysis depend on effect on **total** tax revenue so critical to identify fiscal externalities

## Inter-temporal Substitution: Realized Capital Gains

Realized capital gains occur when individual sells asset at a higher price than buying price

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

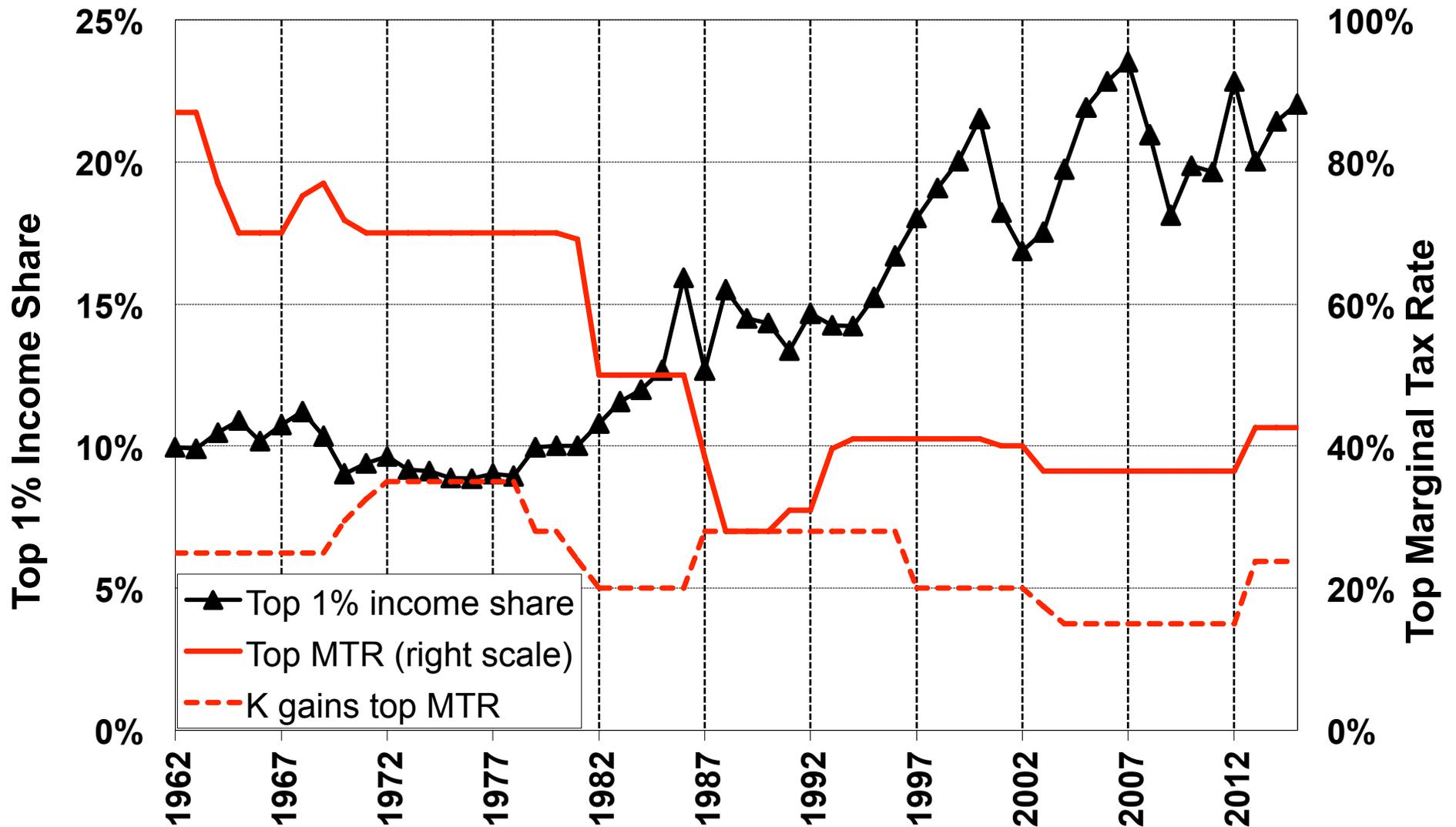
TRA'86 lowered the top tax rate on ordinary income from 50% to 28% but increased the top tax rate on realized capital gains from 20% to 28%

2013: tax rate on KG increased from 15% to 20%+3.8%

⇒ Surge in capital gains realizations in 1986 and 2012 and depressed capital gains in 1987 and 2013 (Saez TPE'17)

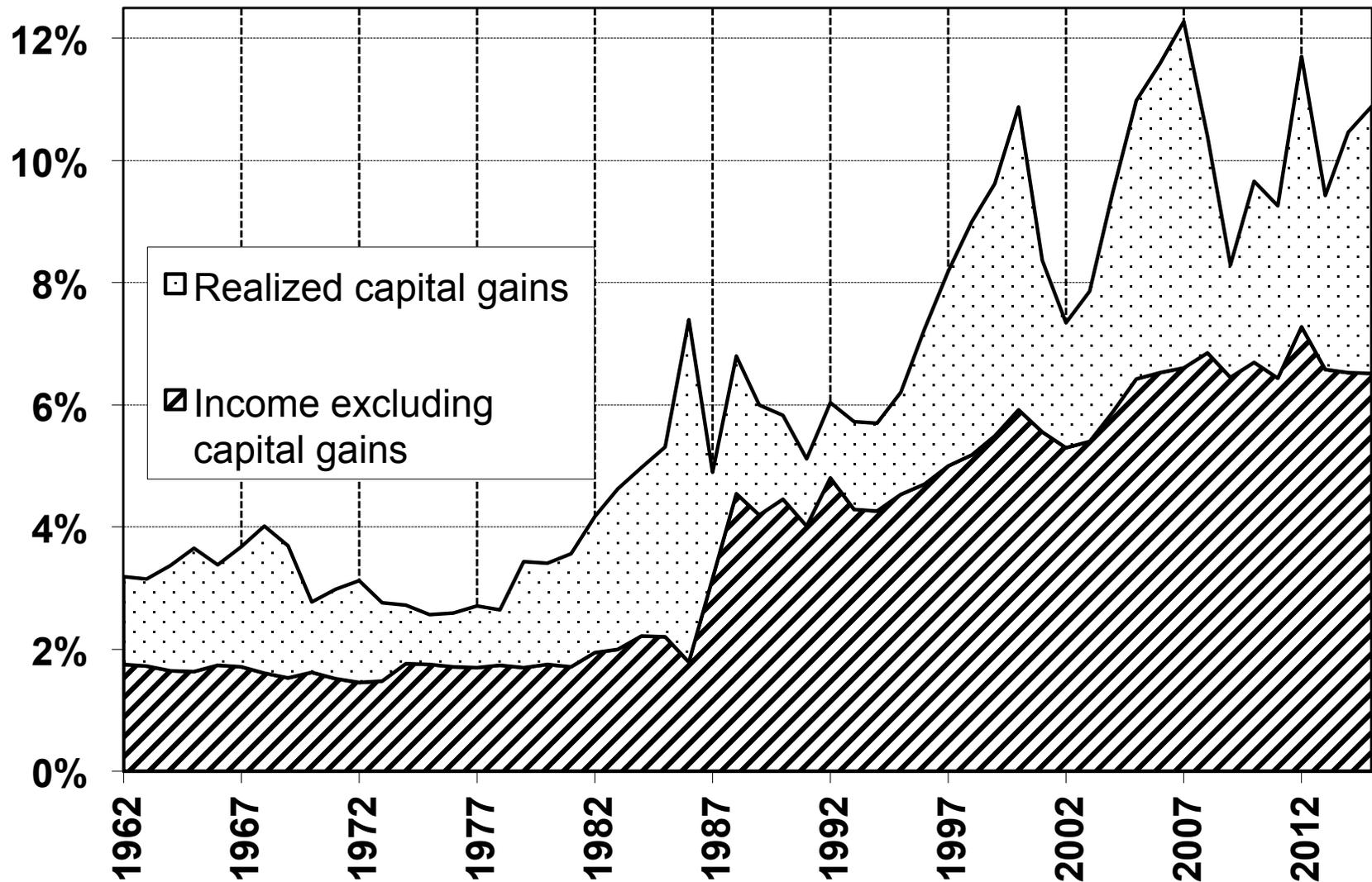
⇒ Short-term elasticity is very large but long-term elasticity is certainly much smaller

## 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.

## US Top 0.1% Income Share and Composition



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.

## **Realized Capital Gains after the 2020 Election**

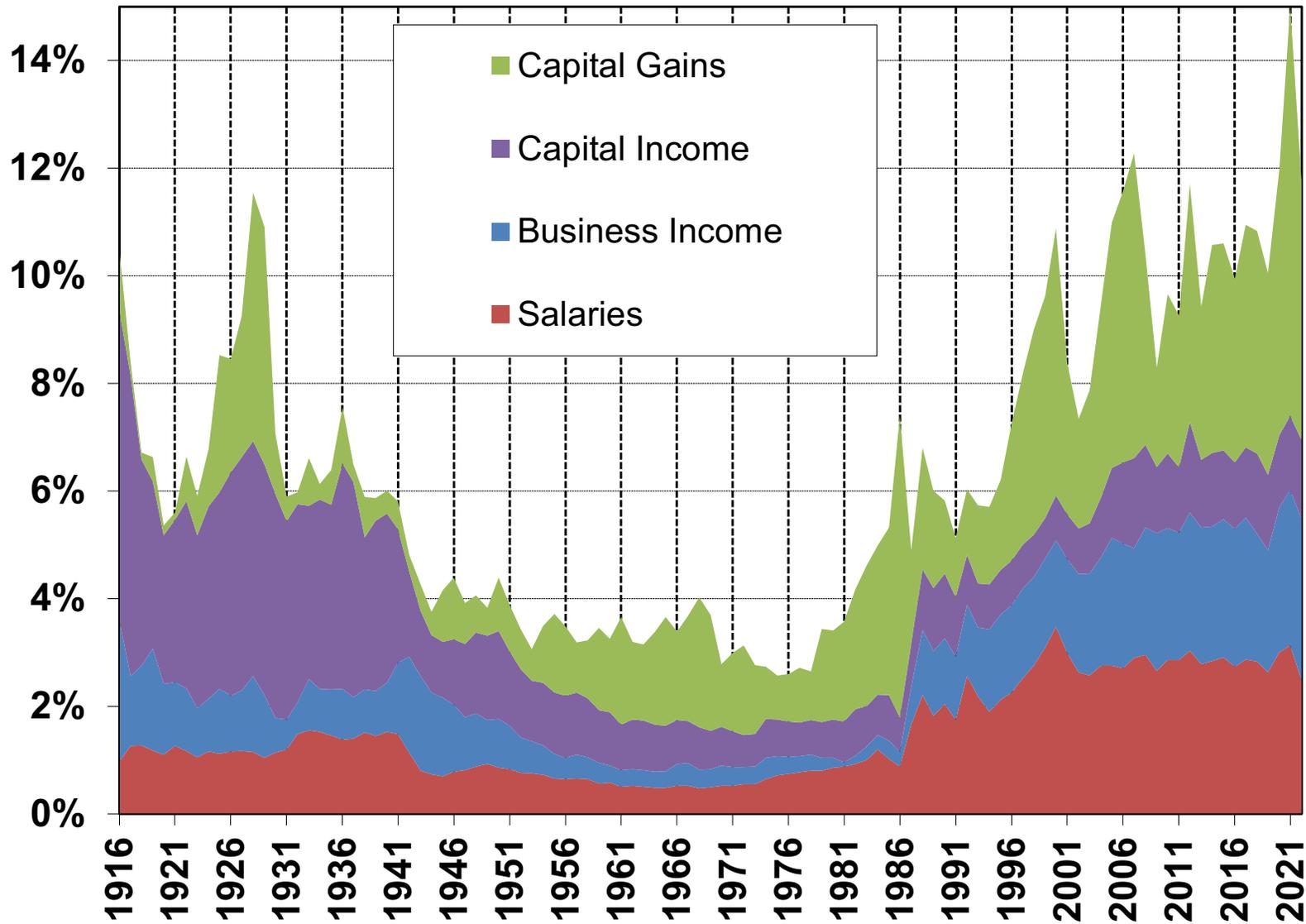
November 2020: Biden gets elected on a program to sharply increase capital gains tax rates

During 2021: build back better bill is discussed in congress with higher surtaxes on incomes \$10m+ and \$25m+ that would also increase tax rates on capital gains by 5 and 8 points

Rich realized a lot of capital gains in late 2020 and in 2021 for fear of imminent capital gains tax increases

By mid 2022: clear that tax increases on the rich will not happen (Manchin-Sinema opposition in US senate)

## US Top 0.1% Pre-Tax Income Share and Composition



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

## Income Shifting: Corporate and 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  $\tau_{\text{distrib}}$  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 lower  $\simeq 30\%$  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 change: 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

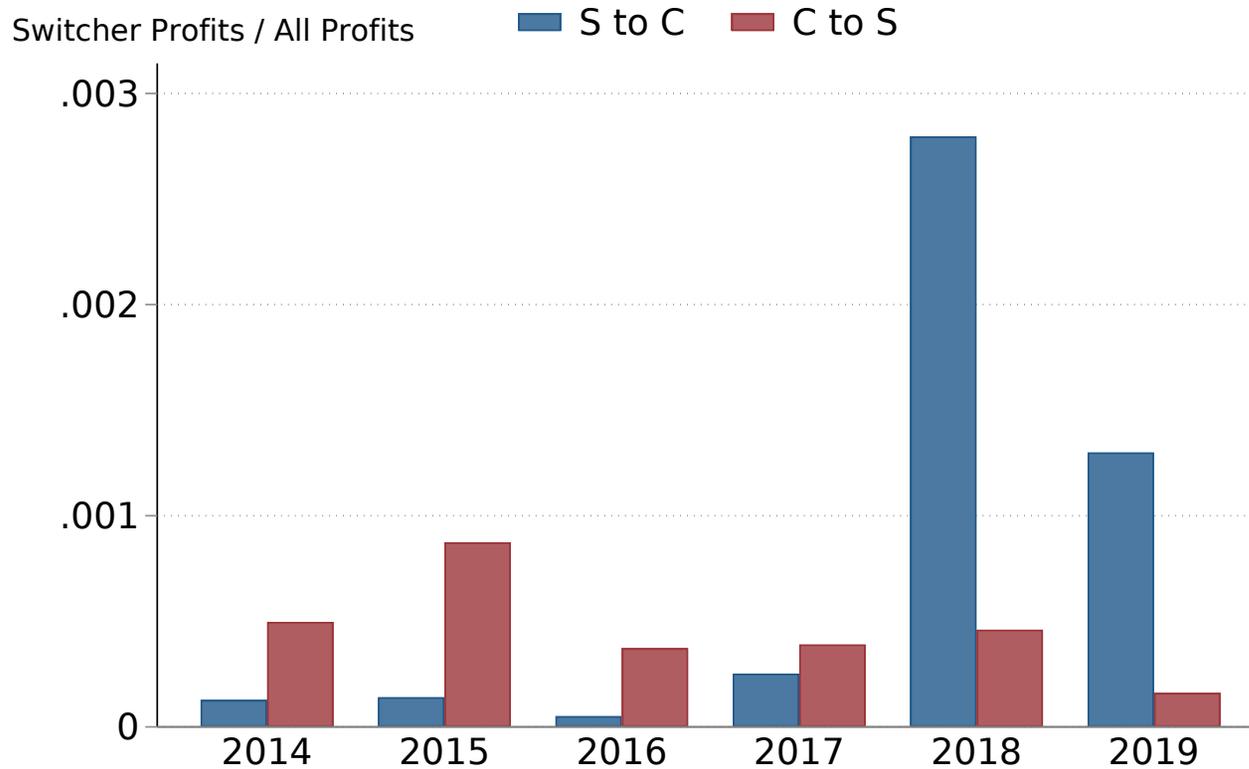
$\Rightarrow$  wealthy people likely to incorporate their businesses in 2018+ (Kennedy et al. 2023 shows some modest movement in 2018-19 likely to accelerate if  $\tau_c = 21\%$  perceived as permanent)

Before TRA'86 (and especially before ERTA'81), top individual rate  $\tau_i$  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

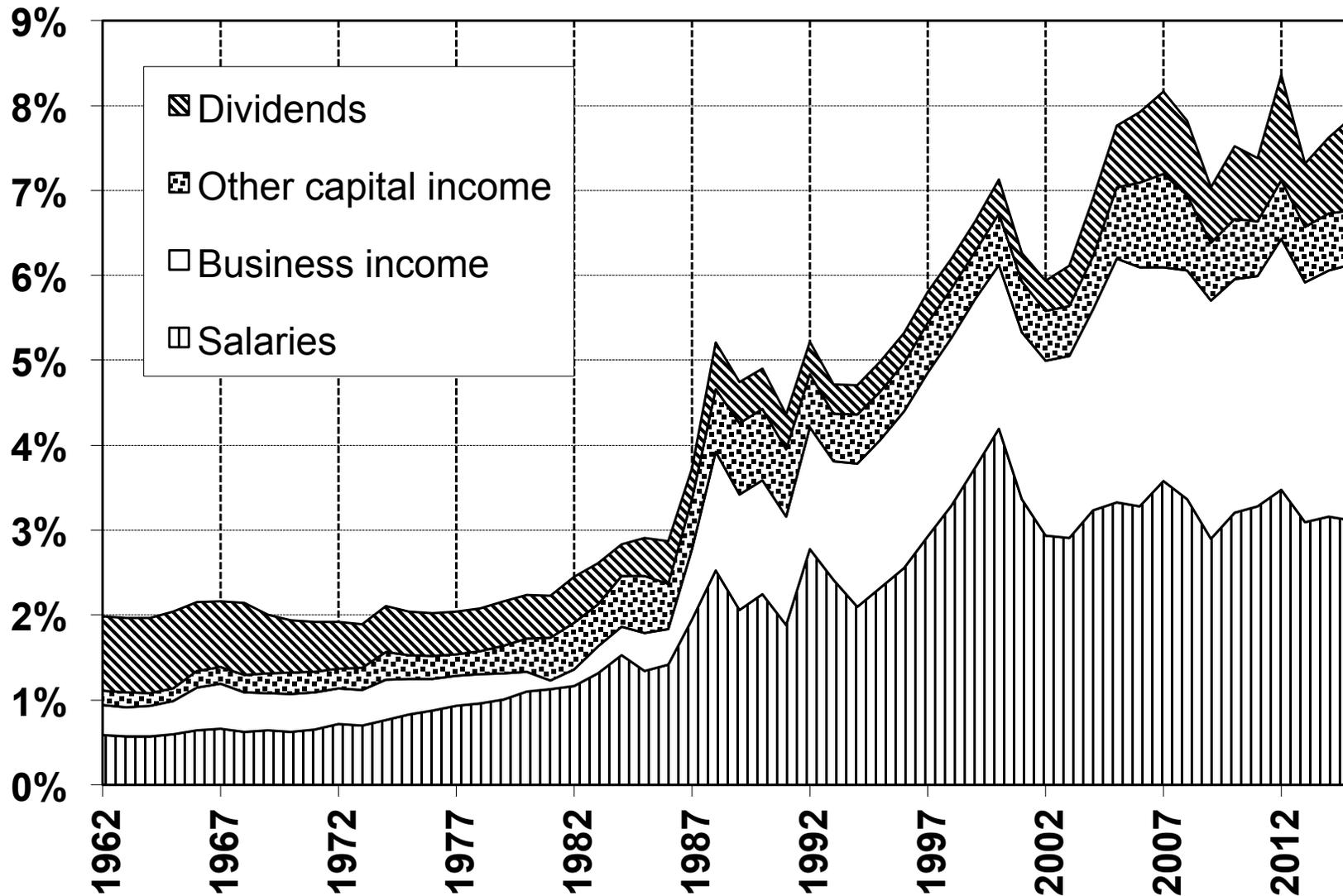
**FIGURE 11: CORPORATE ENTITY-TYPE SWITCHING, 2013-2019**



*Notes:* Figure shows the profit-weighted share of firms that switch their legal entity type from C-to-S or from S-to-C over our sample period. Entity switching is very rare, and increased only modestly after TCJA.

Source: Kennedy et al. 2023

## 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 excluding realized capital gains, and always excluding government transfers.

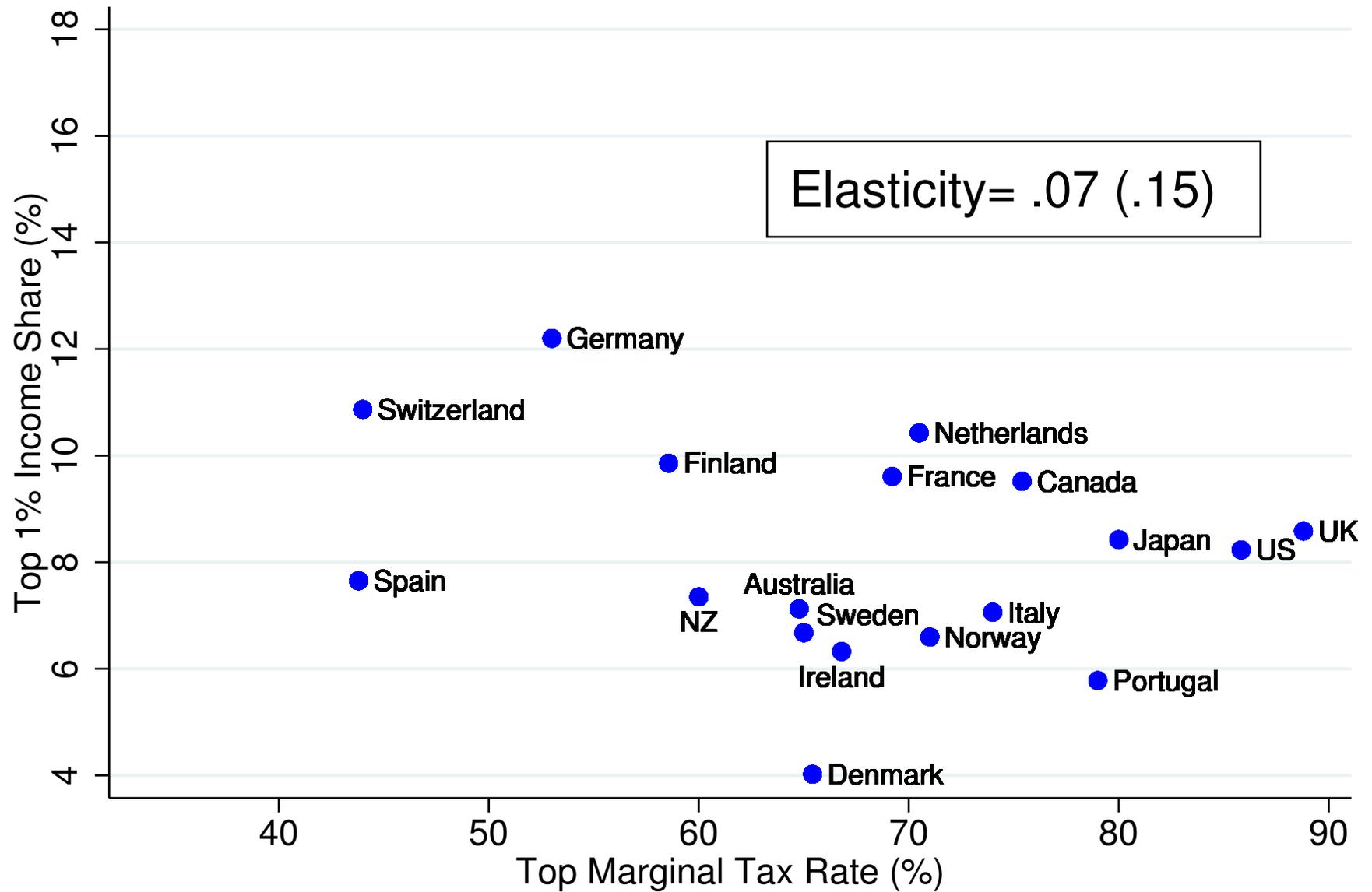
## TOP RATES AND TOP INCOMES INTERNATIONAL EVIDENCE

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

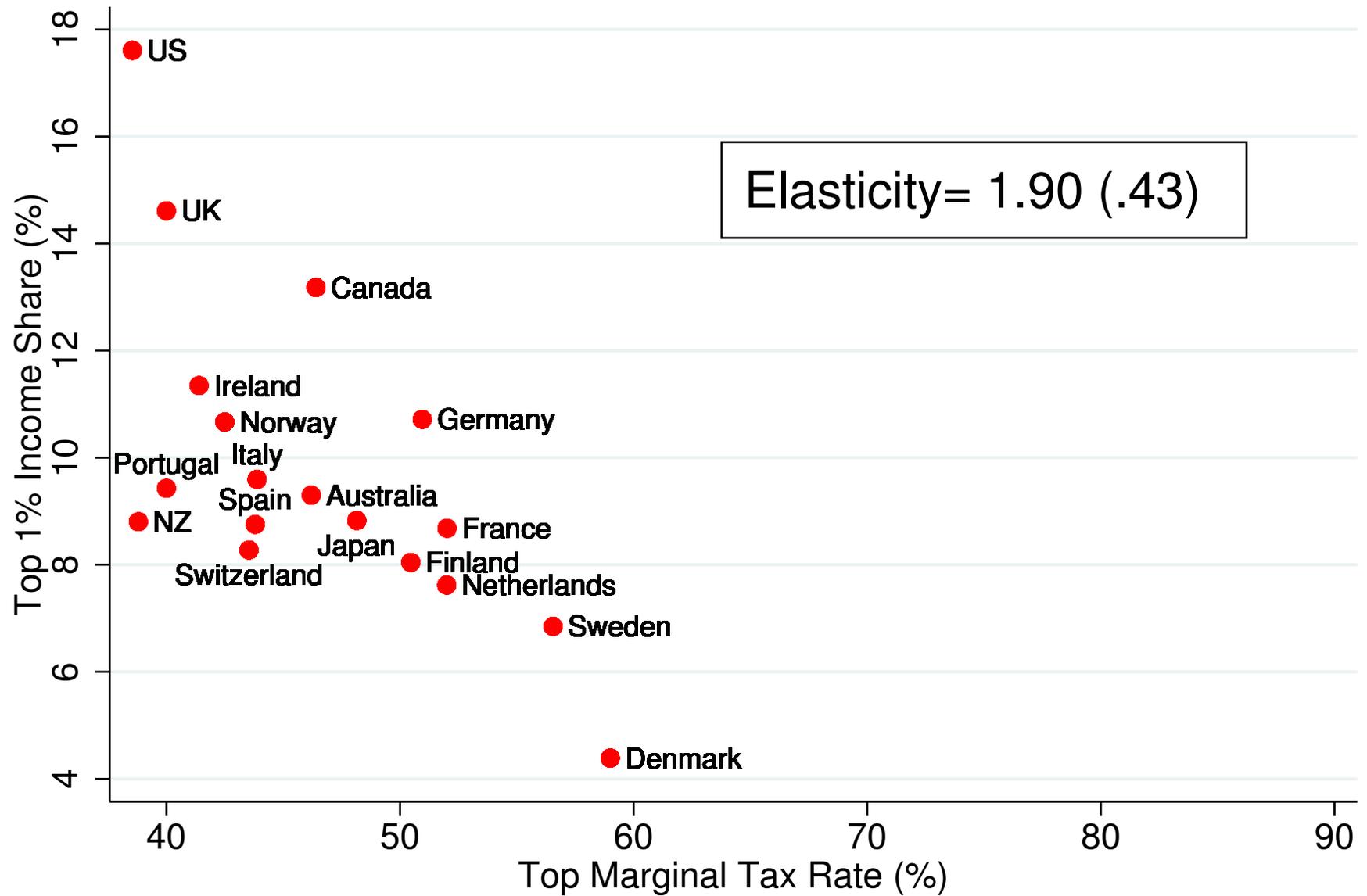
2) Compute top (statutory) individual income tax rates using OECD data [including both central and local income taxes].

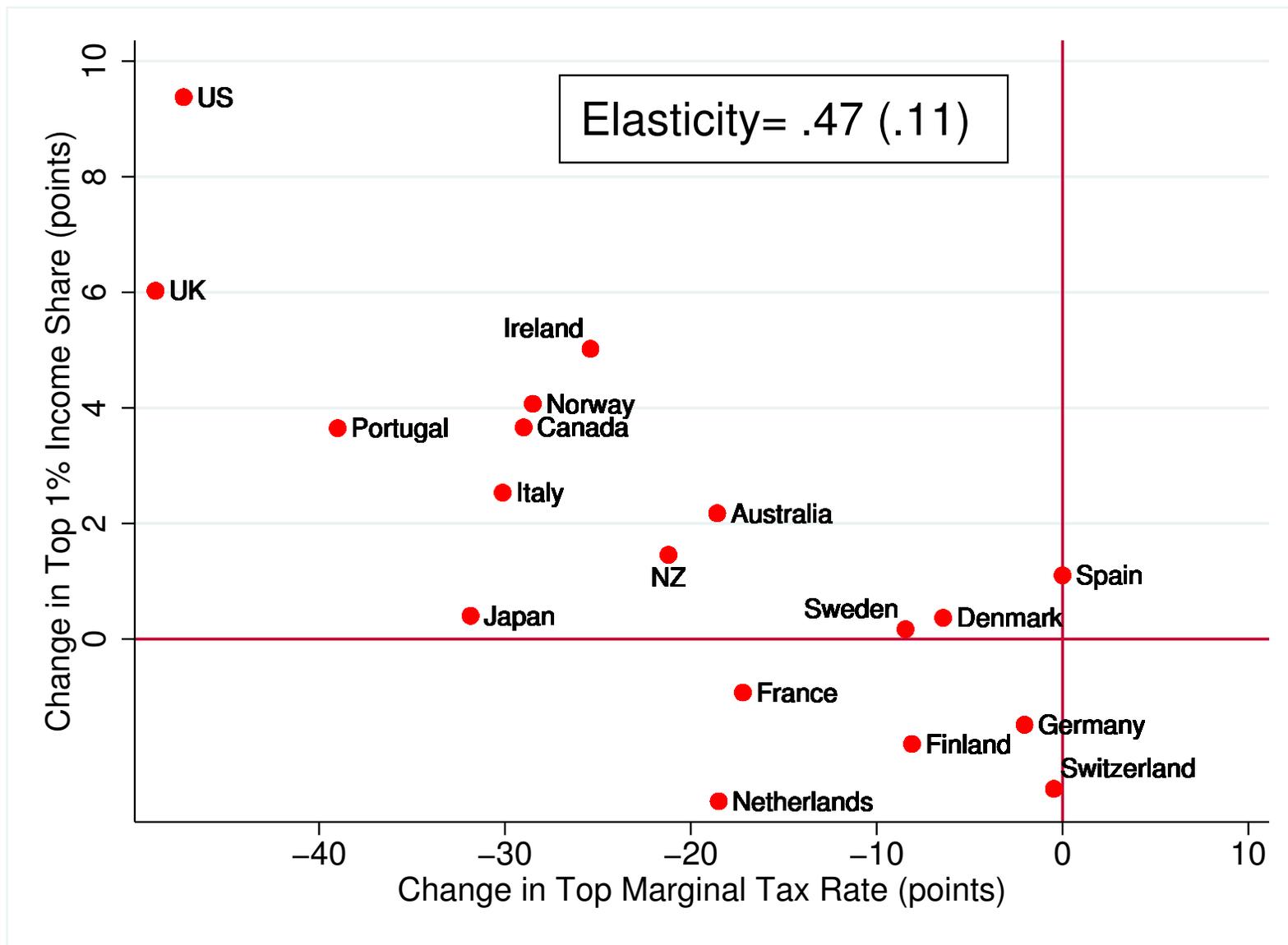
Plot top 1% pre-tax income share against top MTR in 1960-4, in 2005-9, and 1960-4 vs. 2005-9

## A. Top 1% Share and Top Marginal Tax Rate in 1960–4



## B. Top 1% Share and Top Marginal Tax Rate in 2005–9





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

# Top tax rates and top 1% income share 1960-2009

**Table 2: International Evidence on Top Income Elasticities**

	All 18 countries and fixed periods			Bootstrapping period and country set		
	1960-2010	1960-1980	1981-2010	Median	5th percentile	95th percentile
	(1)	(2)	(3)	(4)	(5)	(6)

**A. Effect of the Top Marginal Income Tax Rate on Top 1% Income Share**

Regression:  $\log(\text{Top 1\% share}) = a + e \cdot \log(1 - \text{Top MTR}) + \varepsilon$

No controls	0.324 (0.034)	0.163 (0.039)	0.803 (0.053)	0.364 (0.043)	0.128 (0.085)	0.821 (0.032)
Time trend control	0.375 (0.042)	0.182 (0.030)	0.656 (0.056)	0.425 (0.045)	0.191 (0.091)	0.761 (0.032)
Country fixed effects	0.314 (0.025)	0.007 (0.039)	0.626 (0.044)	0.267 (0.035)	0.008 (0.070)	0.595 (0.026)
Number of observations	774	292	482	286	132	516

# ECONOMIC EFFECTS OF TAXING THE TOP 1%

Strong empirical 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  $\Rightarrow$  Top tax rates should not be too high

**2) Tax Avoidance/Evasion:** Top earners avoid/evade more when top tax rate increases

$\Rightarrow$  a) Eliminate loopholes, b) Then increase top tax rates

**3) Rent-seeking:** Top 1% earners extract more pay (at the expense of the 99%) when top tax rates are low  $\Rightarrow$  High top tax rates are desirable

## Real changes vs. tax avoidance?

Long-term Correlation between **pre-tax** top reported incomes and top tax rates

If due solely to tax avoidance, true top income shares were high in the 1950s-1970s but top earners could lower their taxable income (by retaining earnings in businesses and benefiting from lower tax rate on capital gains)

But top income share including K gains follows the same U-shape (Piketty, Saez, Stantcheva '14)

Piketty, Saez, Zucman QJE'18: comprehensive national income estimates are also U-shaped over the century

⇒ Long-run evolution of inequality is not an artifact of tax avoidance or evasion

# Tax Avoidance: Top 1% Income Shares and Top MTR

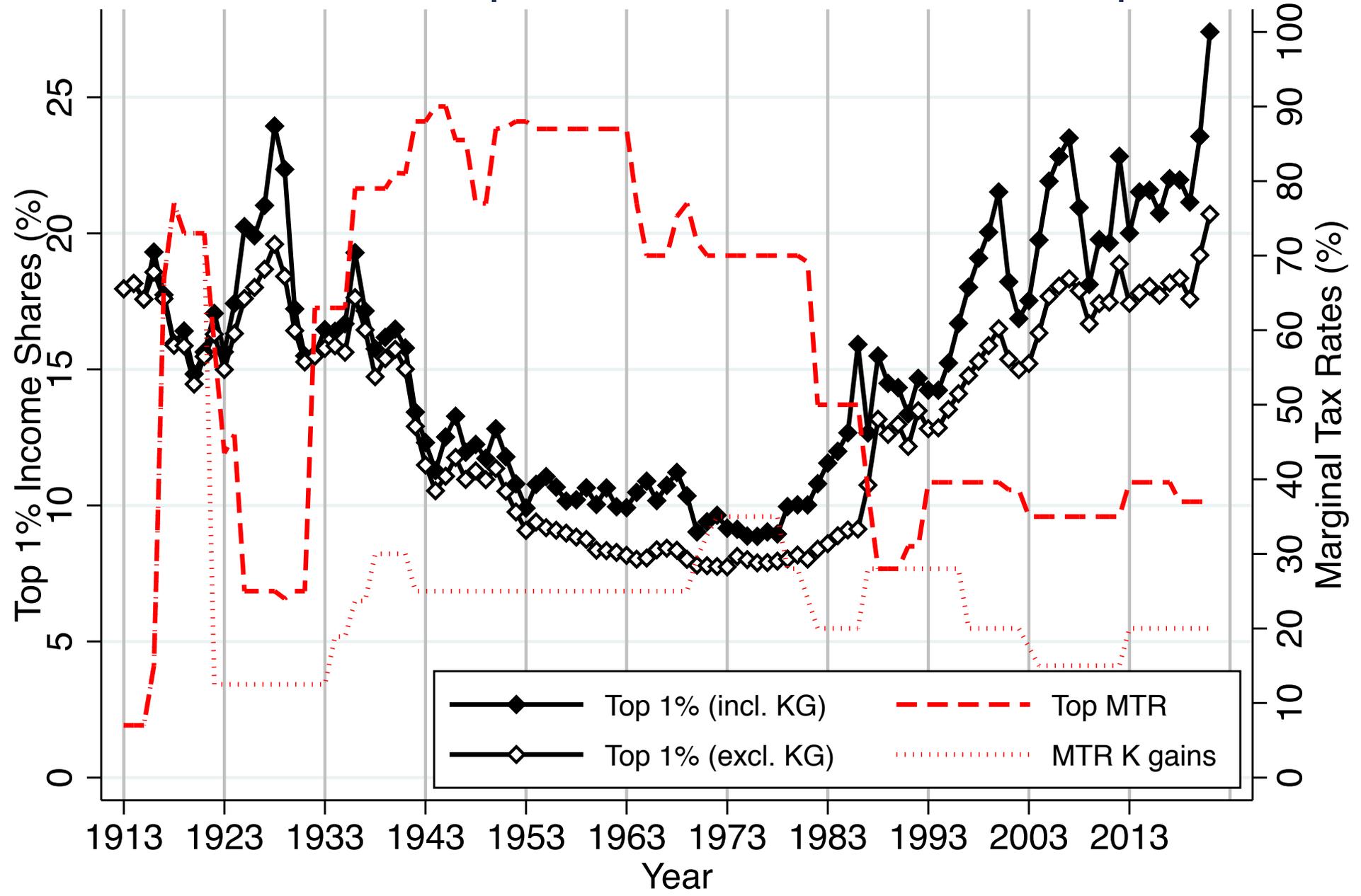
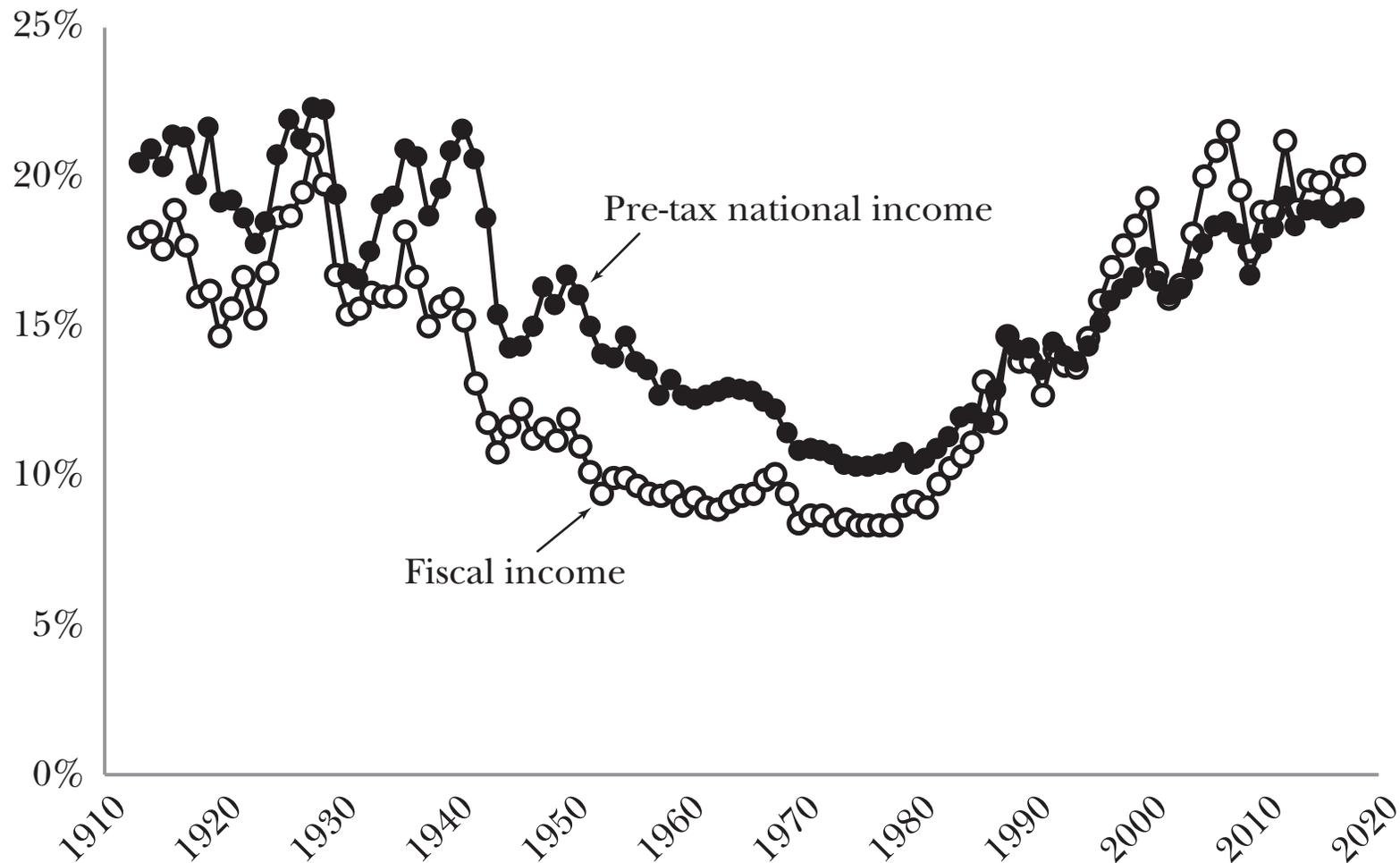


Figure 3

## Share of Income Earned by the Top 1 Percent

Source: Saez and Zucman JEP'20



*Note:* This figure compares the share of fiscal income earned by the top 1 percent tax units (from Piketty and Saez 2003, updated series including capital gains in income to compute shares but not to define ranks, to smooth the lumpiness of realized capital gains) to the share of pre-tax national income earned by the top 1 percent equal-split adults (from Piketty, Saez, and Zucman 2018, updated September 2020, available on WID.world).

## **Real changes vs. tax Avoidance? Charitable giving**

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

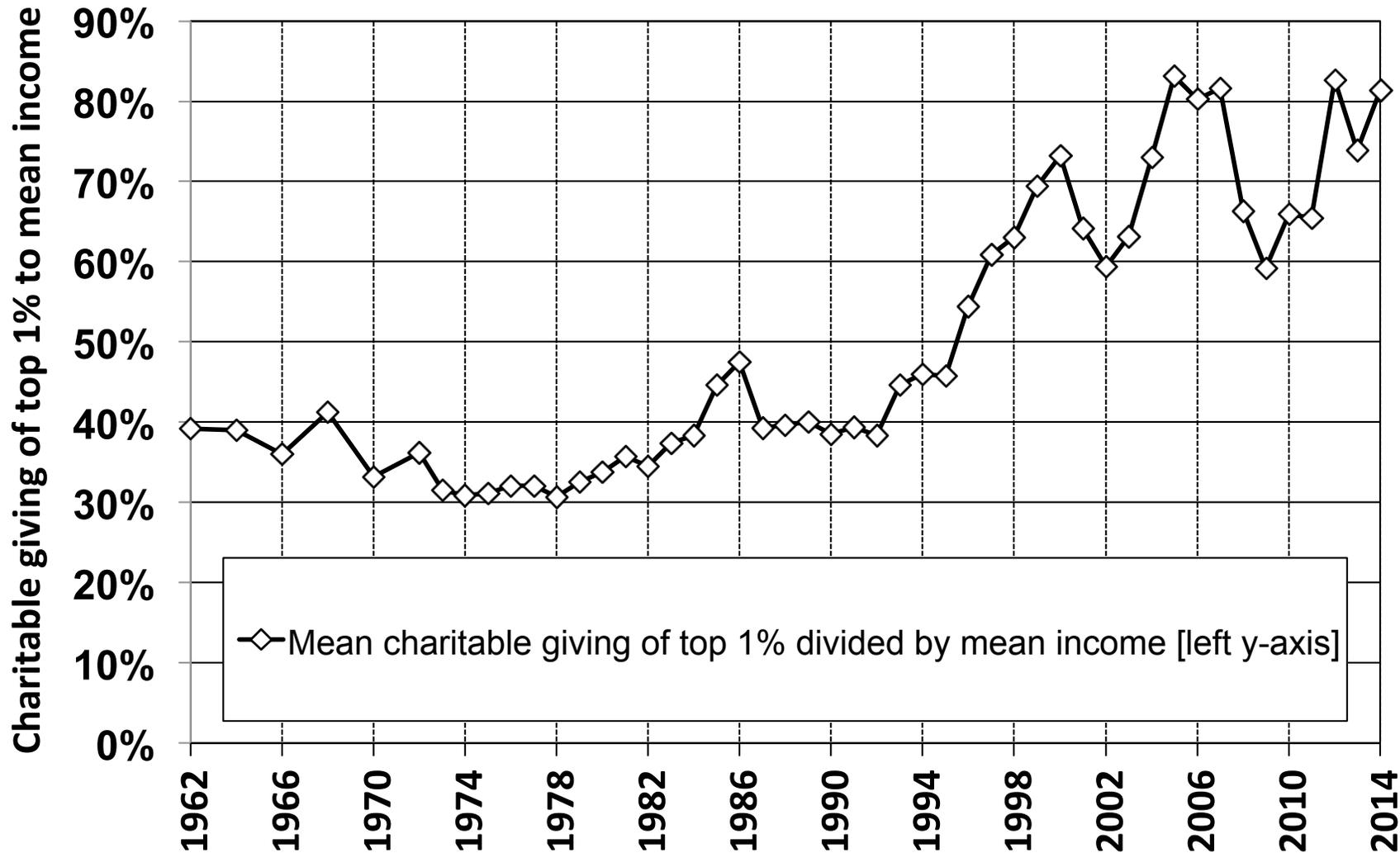
Because charitable giving is tax deductible, incentives to give are stronger when tax rates are higher

Under the tax avoidance scenario, reported incomes and charitable giving of top earners should move in opposite directions

Empirically, charitable giving of top income earners has grown in close tandem with top incomes

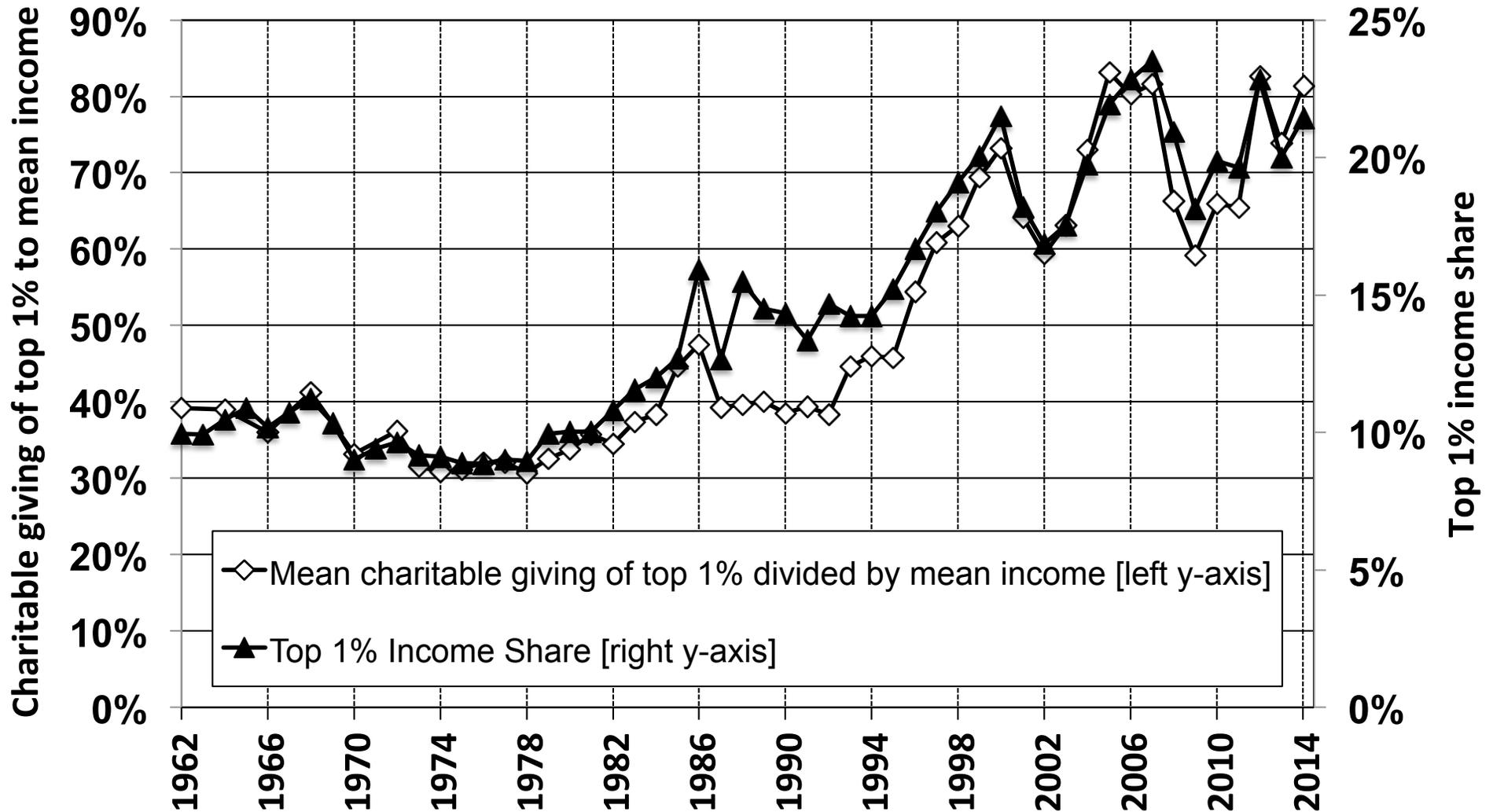
⇒ Incomes at the top have grown for real

## Charitable Giving of Top 1% Income Earners



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

## Charitable Giving of Top 1% Income Earners



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).

## 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 tests:

1) US evidence:

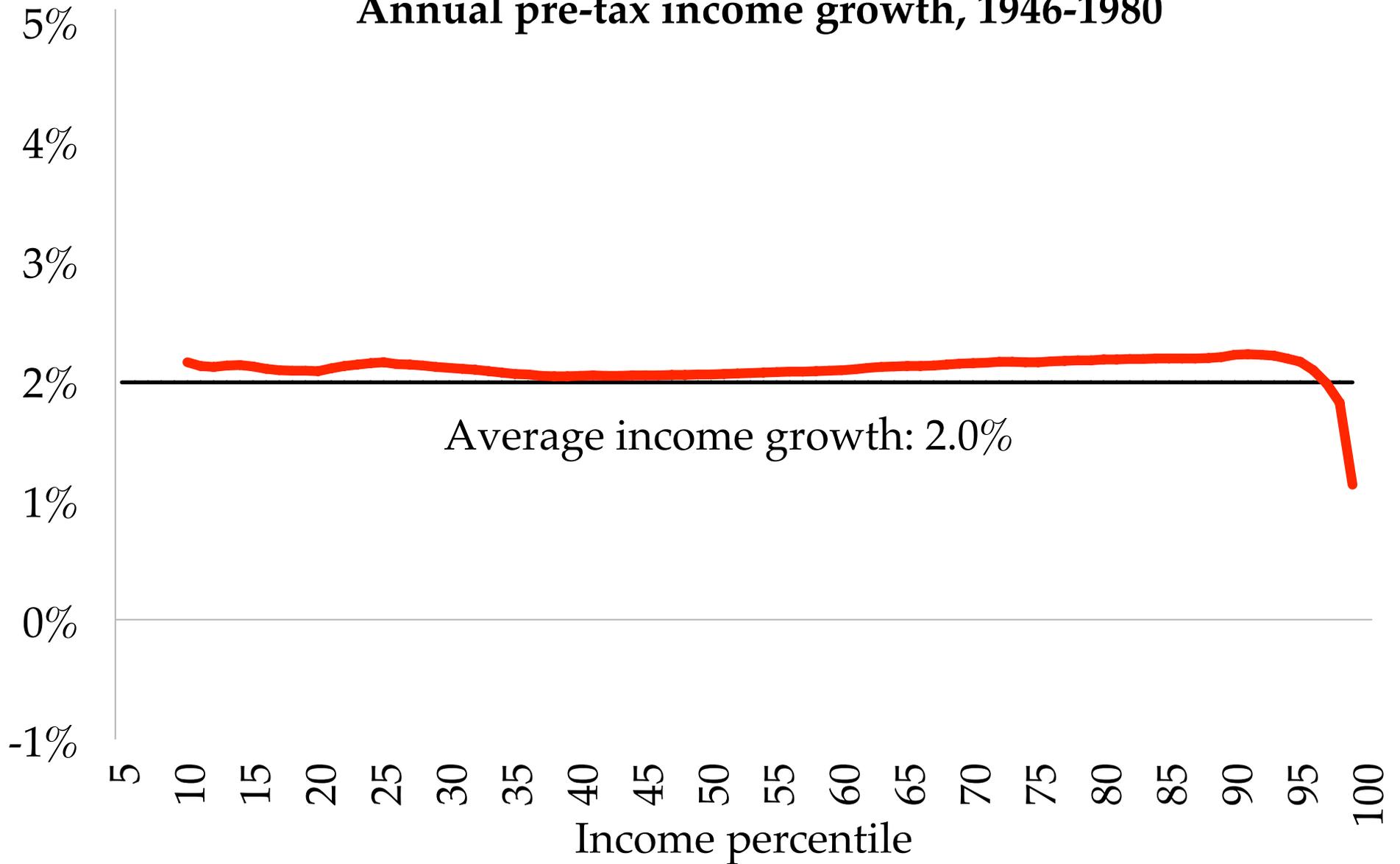
a) Income growth was high and broadly distributed from 1946-1980 when top tax rates were high

b) Growth has been weaker and skewed toward the rich after 1980 when top tax rates went down

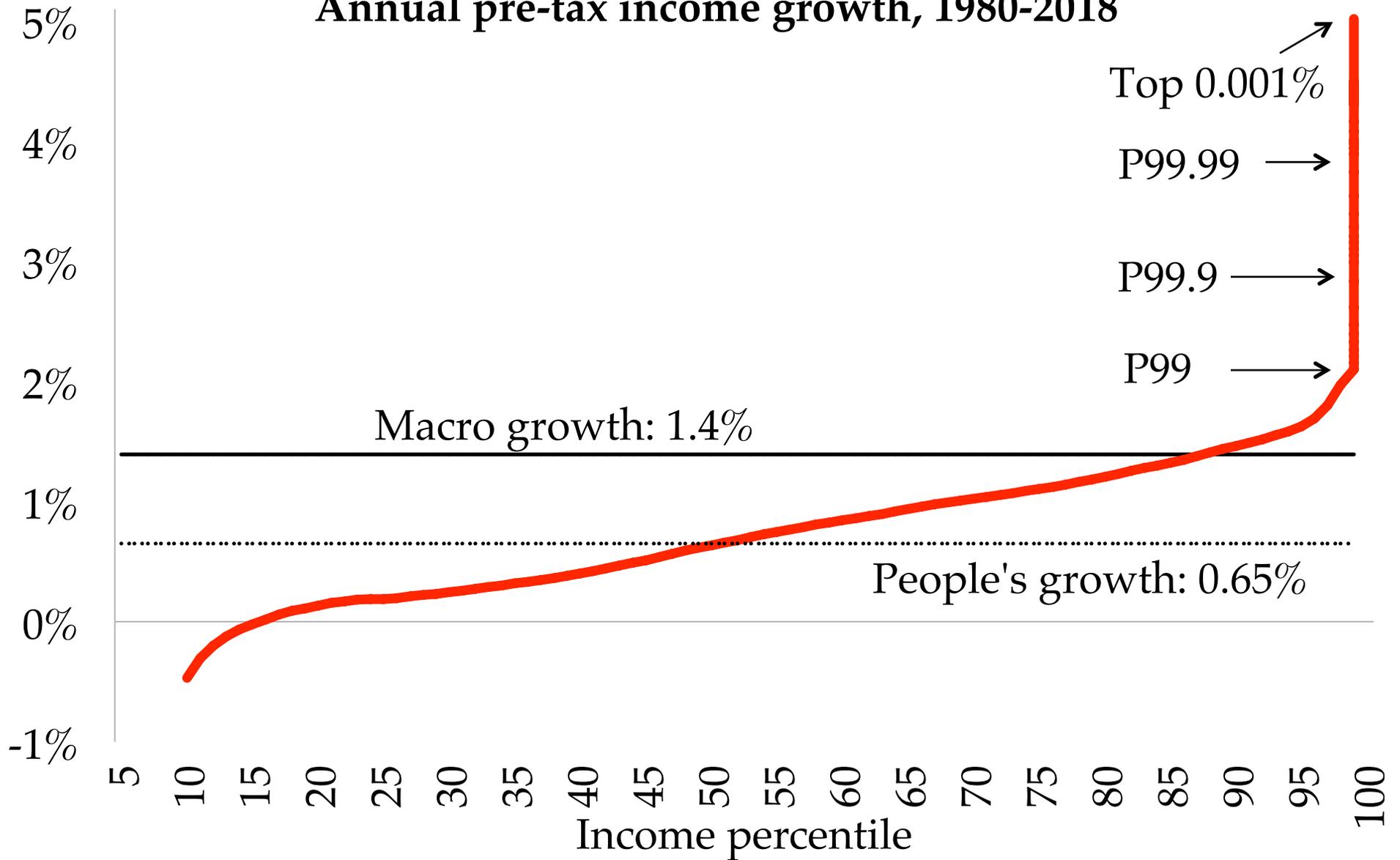
⇒ Consistent with rent-seeking effects

2) Look at cross-country correlation between economic growth and top tax rate cuts ⇒ No correlation supports rent-seeking

# Annual pre-tax income growth, 1946-1980



# Annual pre-tax income growth, 1980-2018



## INTERNATIONAL CEO PAY EVIDENCE

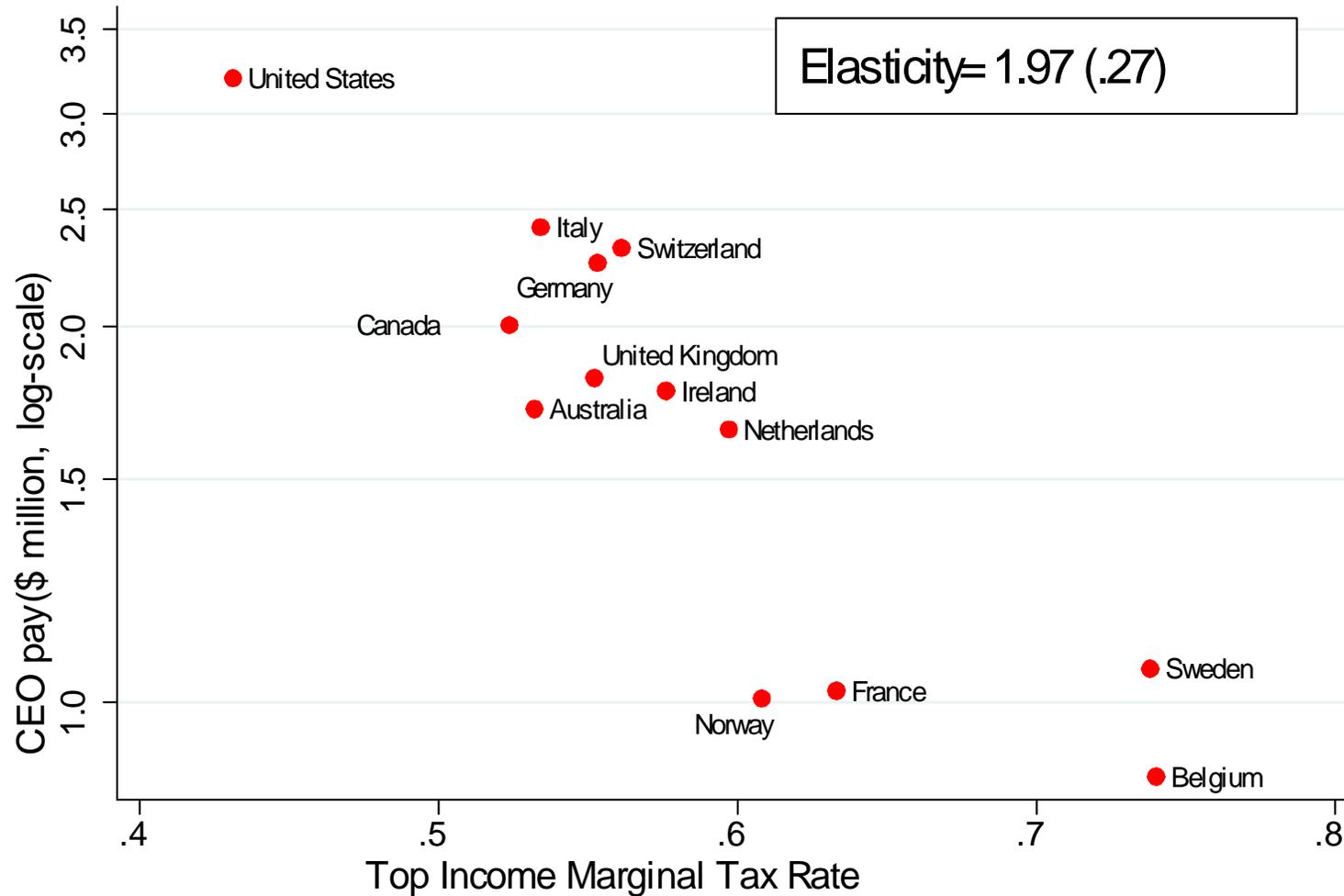
Recent micro-data for 2006 gathered by Fernandes, Ferreira, Matos, Murphy RFS'12.

1) CEO pay across countries strongly negatively correlated with top tax rates

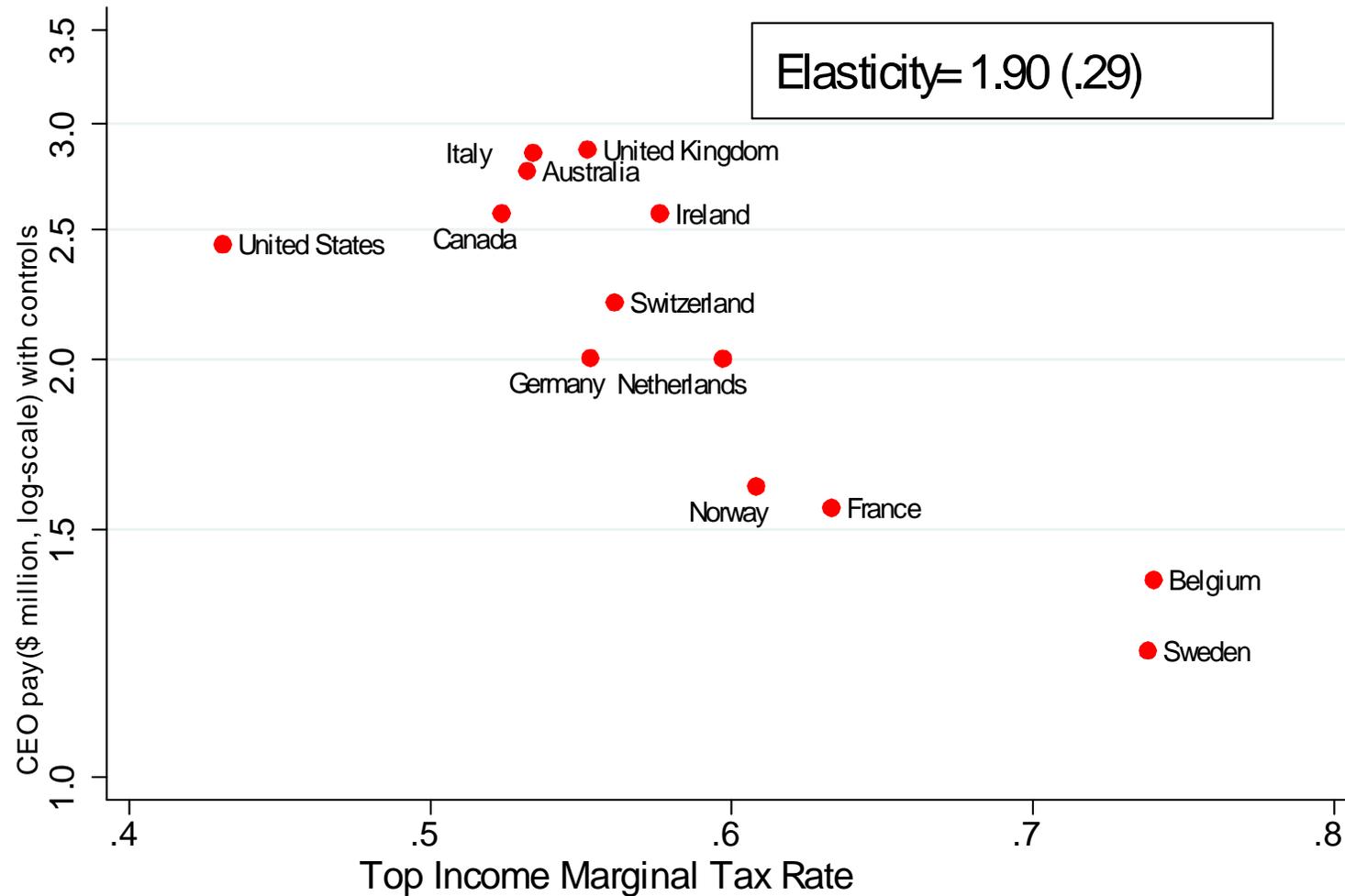
2) Correlation remains as strong even when controlling for firms' characteristics and performance

⇒ Consistent with rent-seeking effects

## A Average CEO compensation



## B. Average CEO compensation with controls



# International CEO Pay: Governance

**Table 4: International CEO Pay Evidence**

Outcome (LHS variable)	Log(CEO pay)	Log(CEO pay)	Log(CEO pay)	Log(CEO pay)	Log(CEO salary)	Log(CEO bonus and equity pay)
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Explanatory variables (RHS variables)</b>						
log(1-Top MTR)	1.97*** (0.27)	1.90*** (0.286)	1.92*** (0.336)	1.90*** (0.328)	0.35* (0.189)	4.68*** (0.782)
Governance index			-0.10*** (0.020)	-0.19*** (0.038)	-0.02 (0.072)	-0.26 (0.201)
log(1-Top MTR)*Governance index				-0.13** (0.057)	0.06 (0.089)	-0.03 (0.281)
Firm and CEO controls	no	yes	yes	yes	yes	yes
Number of observations	2,959	2,844	2,711	2,711	2,691	2,711

## INTERNATIONAL MIGRATION (skip)

Public debate concern that top skilled individuals move to low tax countries (e.g., in EU context) or low tax states (within US Federation)

Migration concern bigger in public debate than supply-side concern within a country

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

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

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

Various US states studies: Moretti-Wilson AER17, 2019, Rauh-Shyu '19 (big effects), Young et al. '16 (modest effects)

## KLEVEN-LANDAIS-SAEZ-SCHULTZ QJE'14

Exploit the 1991 Danish tax scheme: immigrants with high earnings ( $\geq 103,000$  Euros/year) taxed at flat 25% rate (instead of regular progressive 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 below threshold (control)

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

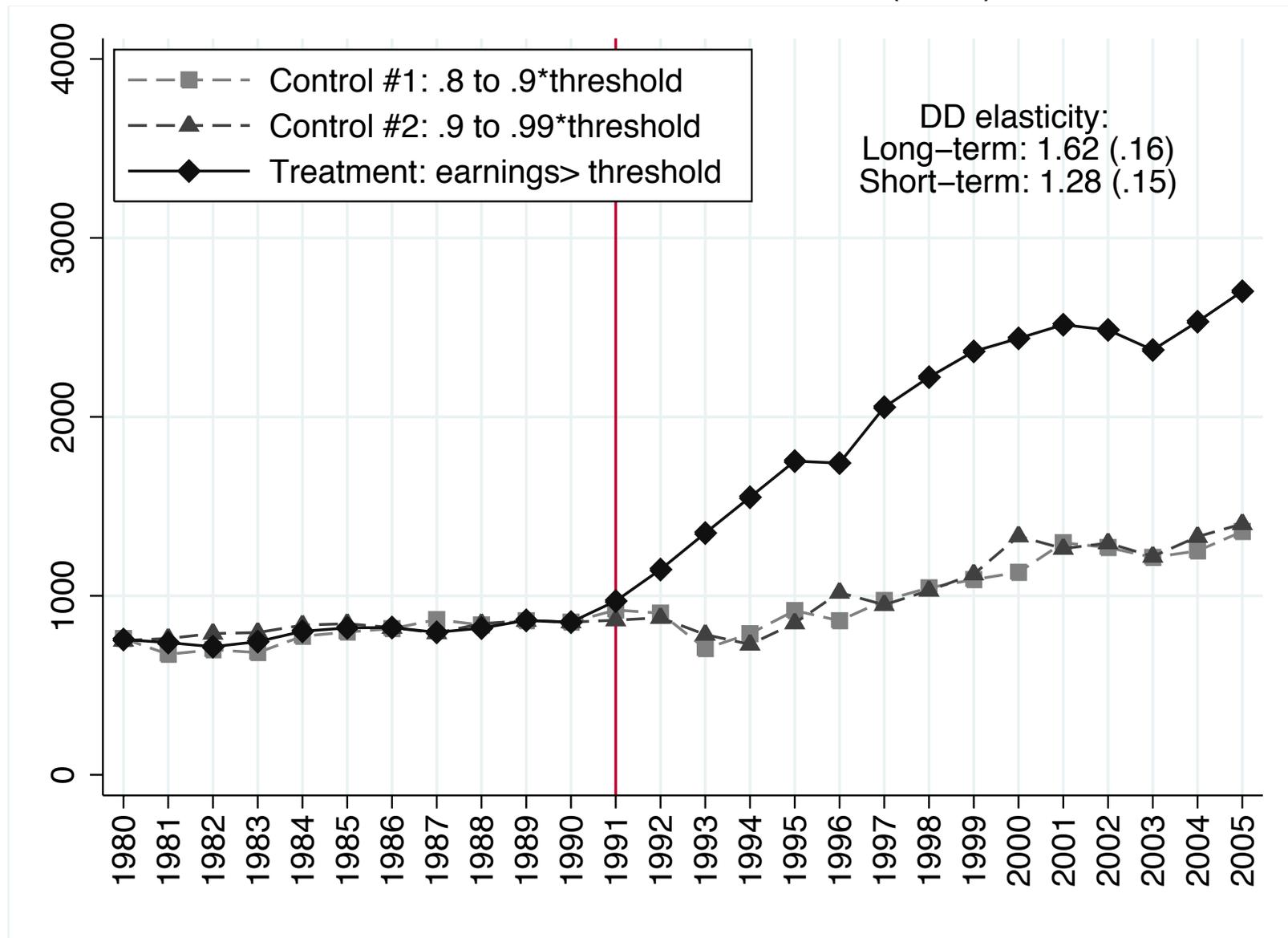
⇒ Elasticity of migration with respect to net-of-tax rate above one (much larger than within country elasticity of earnings)

⇒ Preferential schemes proliferate in EU (Flamant et al. 21)

⇒ Tax coordination will be key to preserve progressive taxation in the EU (but tax competition hard-coded in EU treaties)

Figure 1 : Total number of foreigners in different income groups

Source: Kleven, Landais, Saez, Schultz QJE (2014)



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

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

▶ DD specifications

Figure 4 : Earnings Density for Foreigners

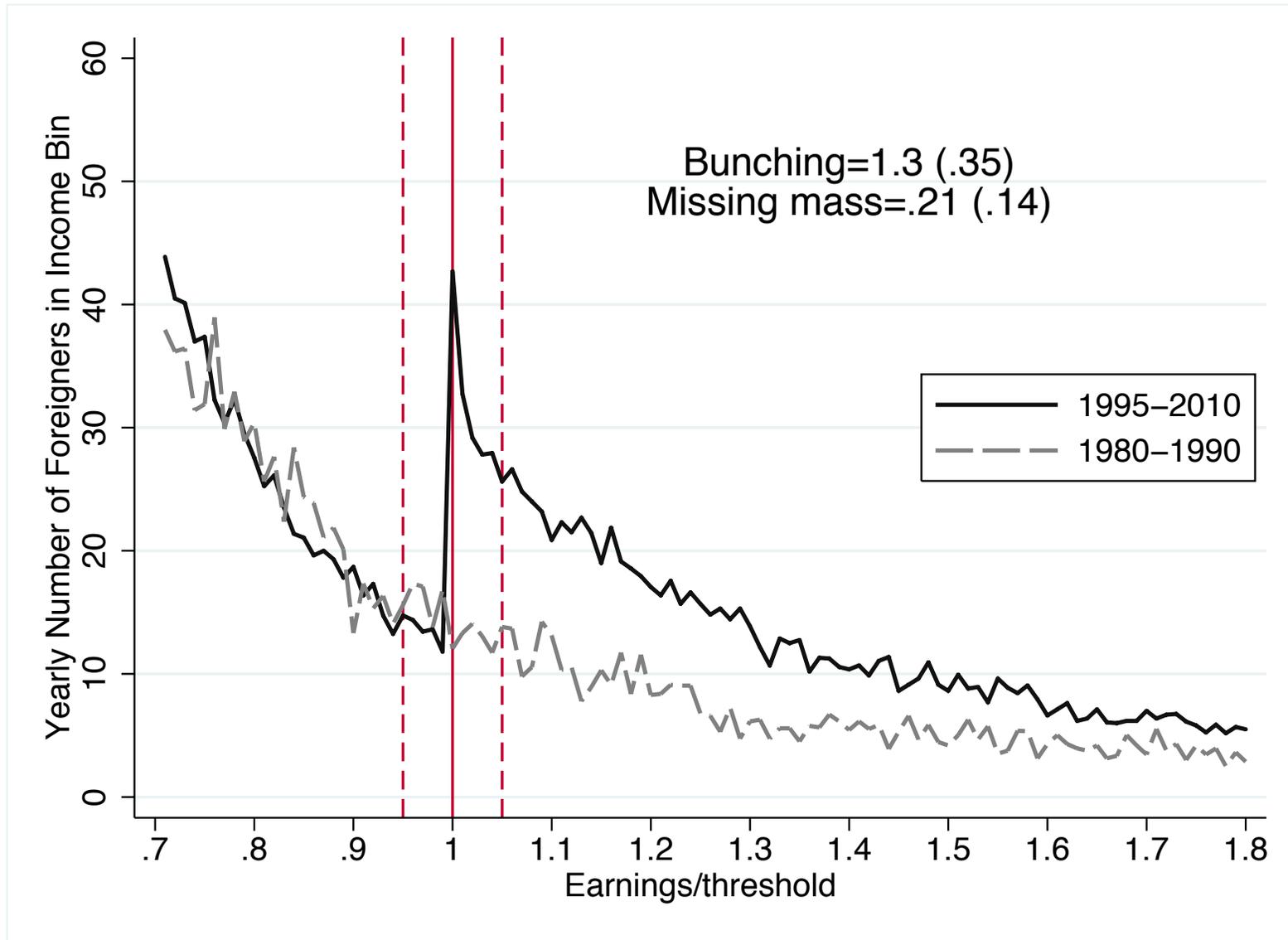
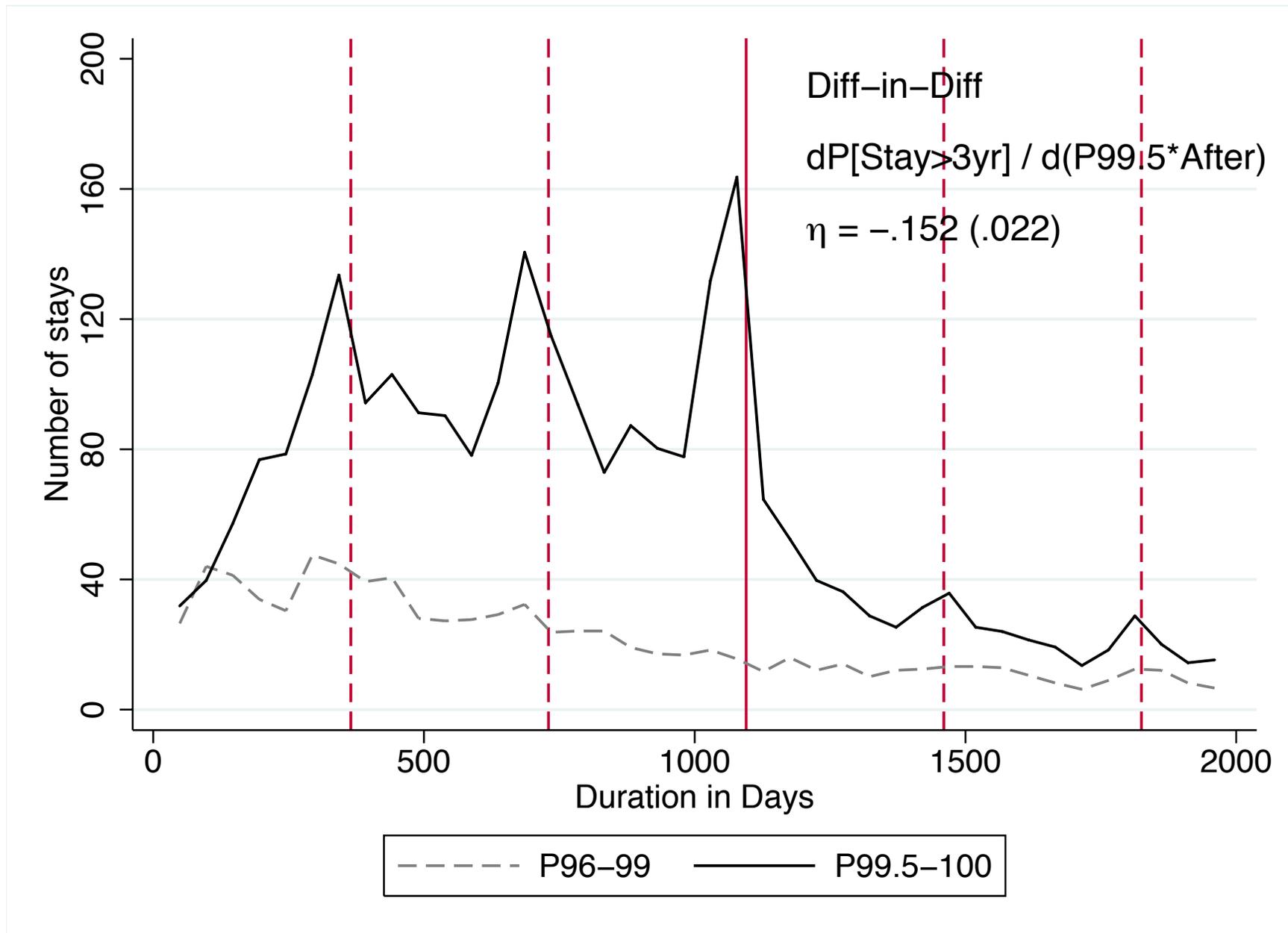


Figure 6 : Density of the Duration of Stay of Foreigners: 1991-2006



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