

Taxable Income Elasticities

131 Undergraduate Public Economics
Emmanuel Saez
UC Berkeley

TAXABLE INCOME ELASTICITIES

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

Two main reasons:

- 1) 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

Recent overview of this literature: Saez-Slemrod-Giertz JEL'12

FEDERAL US INCOME TAX CHANGES

Tax rates change frequently over time

Biggest tax rate changes have happened at the top:

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)

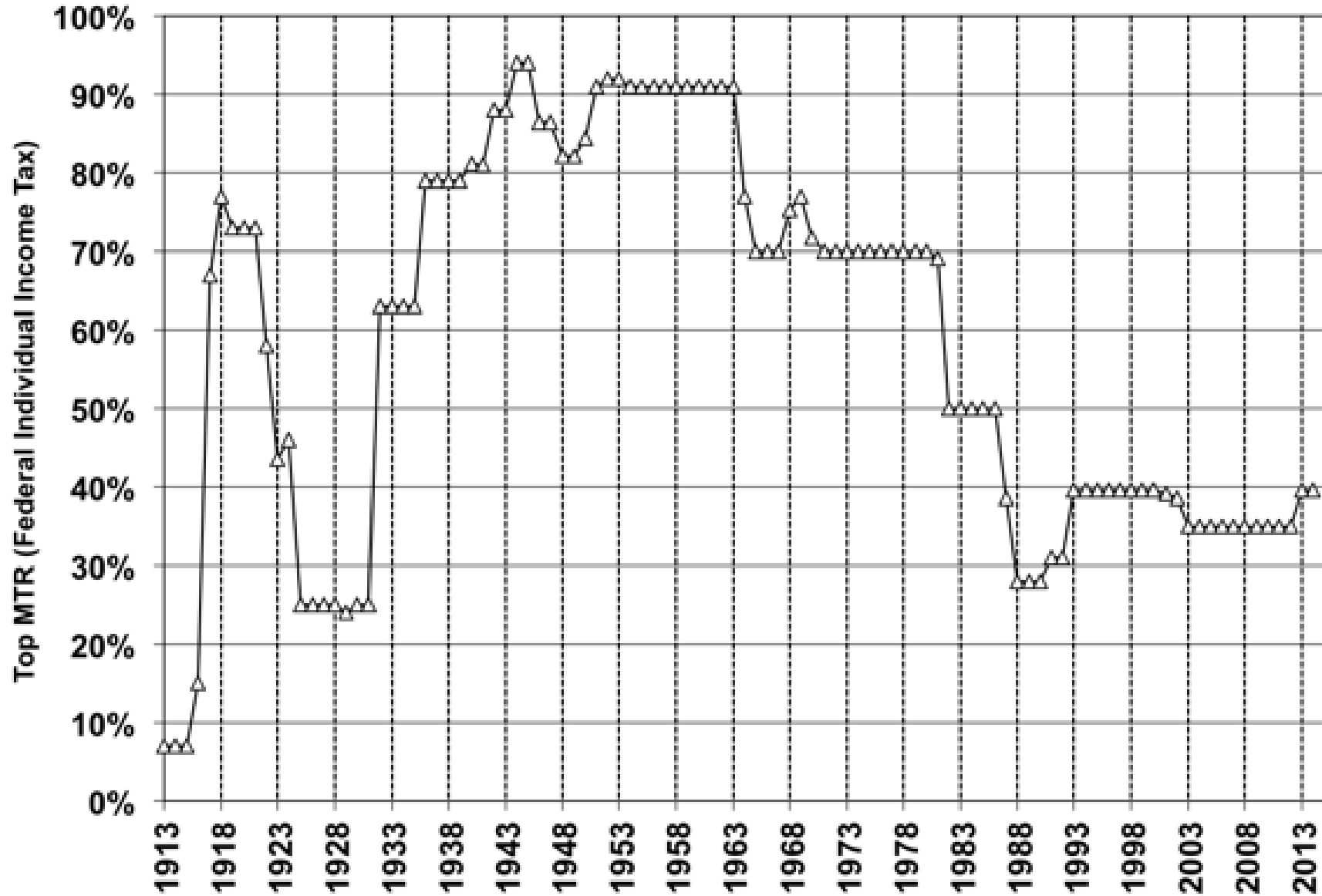
Bush: EGTRRA '01: top rate ↓ 39.6% to 35% (2001-2003)

Obama '13: top rate ↑ 35% to 39.6%+3.8% (2012-2013)

Trump '17: top rate likely to decrease a lot

Taxable Income = Ordinary Income + Realized Capital Gains
- Deductions ⇒ Each component can respond to *MTRs*

US Top Marginal Tax Rate (Federal Individual Income Tax)



Source: IRS. Statistics of Income Division. Historical Table 23

LONG-RUN EVIDENCE IN THE US

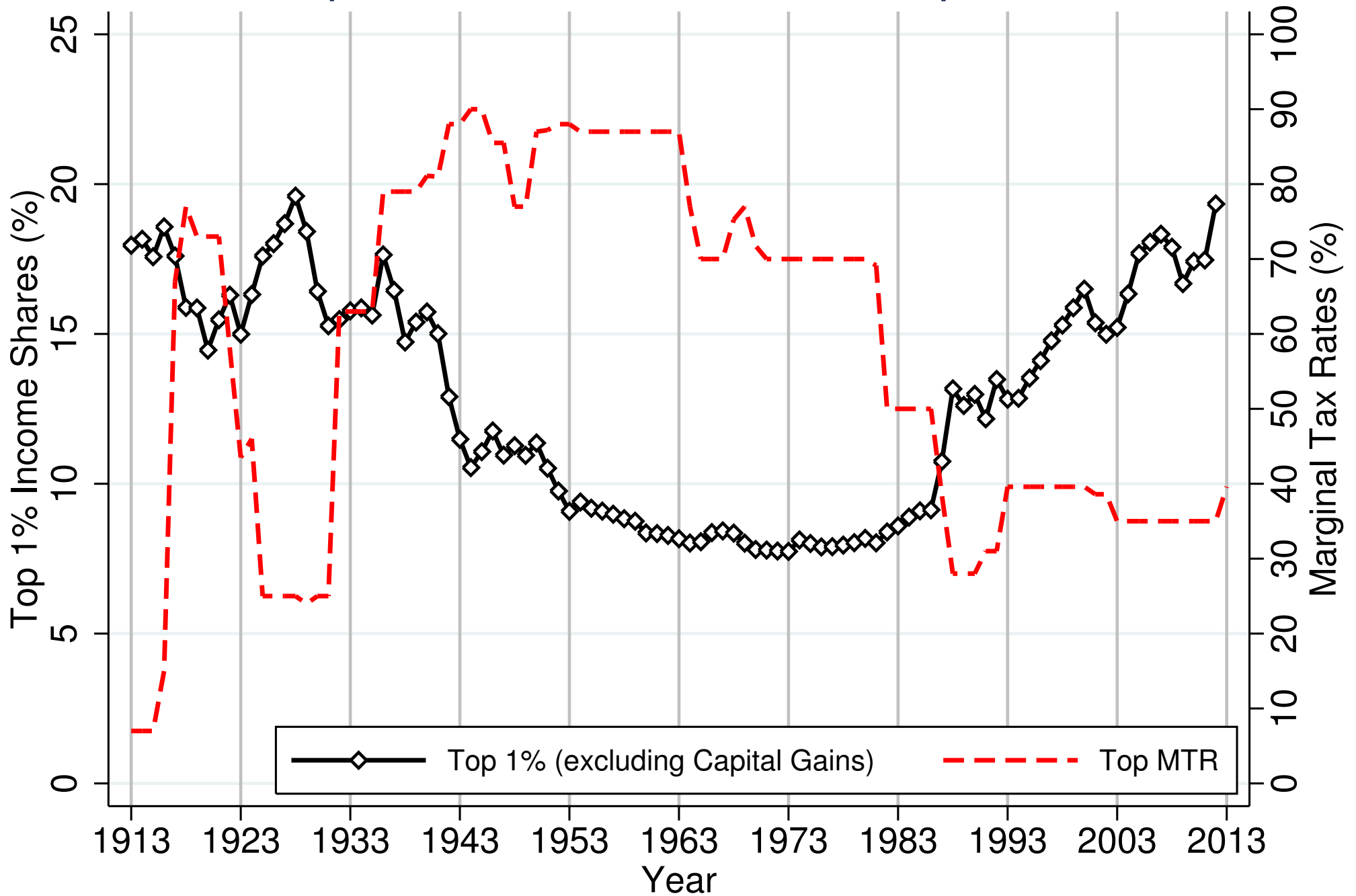
Goal: evaluate whether top **pre-tax** incomes respond to changes in one minus the marginal tax rate (=net-of-tax rate)

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

Top 1% 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 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:

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

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

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

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: estimated elasticities are large: around 0.7 for long-run, and sometimes over 1 for short-run episodes (such as '86-'88).

2) Correlation between tax rates and income shares 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 unlikely to be due to a universal labor supply elasticity

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 to 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

Such tax avoidance affect tax revenue through these other tax bases and such revenue effects need to be accounted for in optimal tax analysis

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

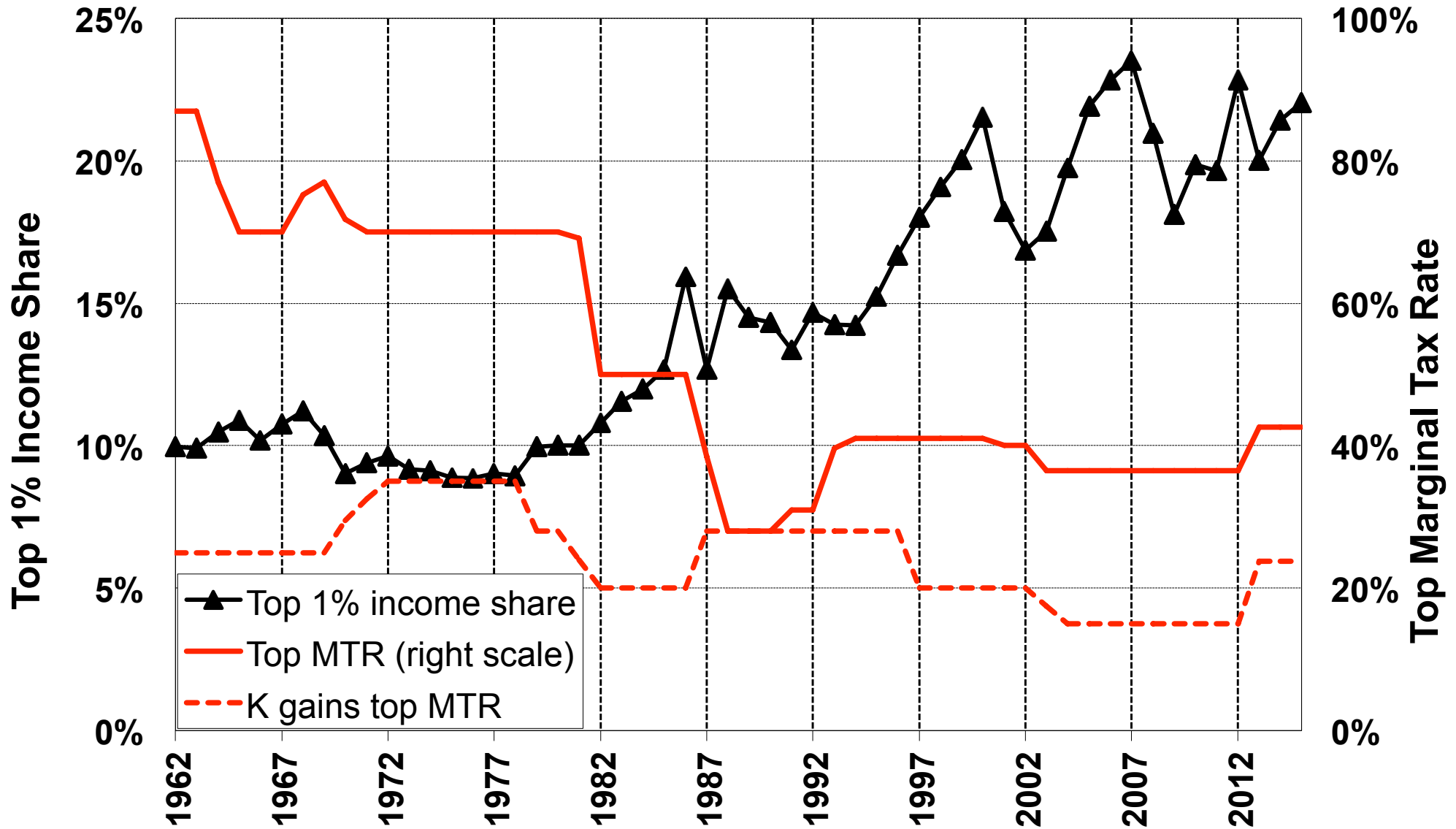
TRA'86 lowered the top tax rate on ordinary income from 50% to 28% but increased the top tax rate on realized capital gains from 20% to 28%

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

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

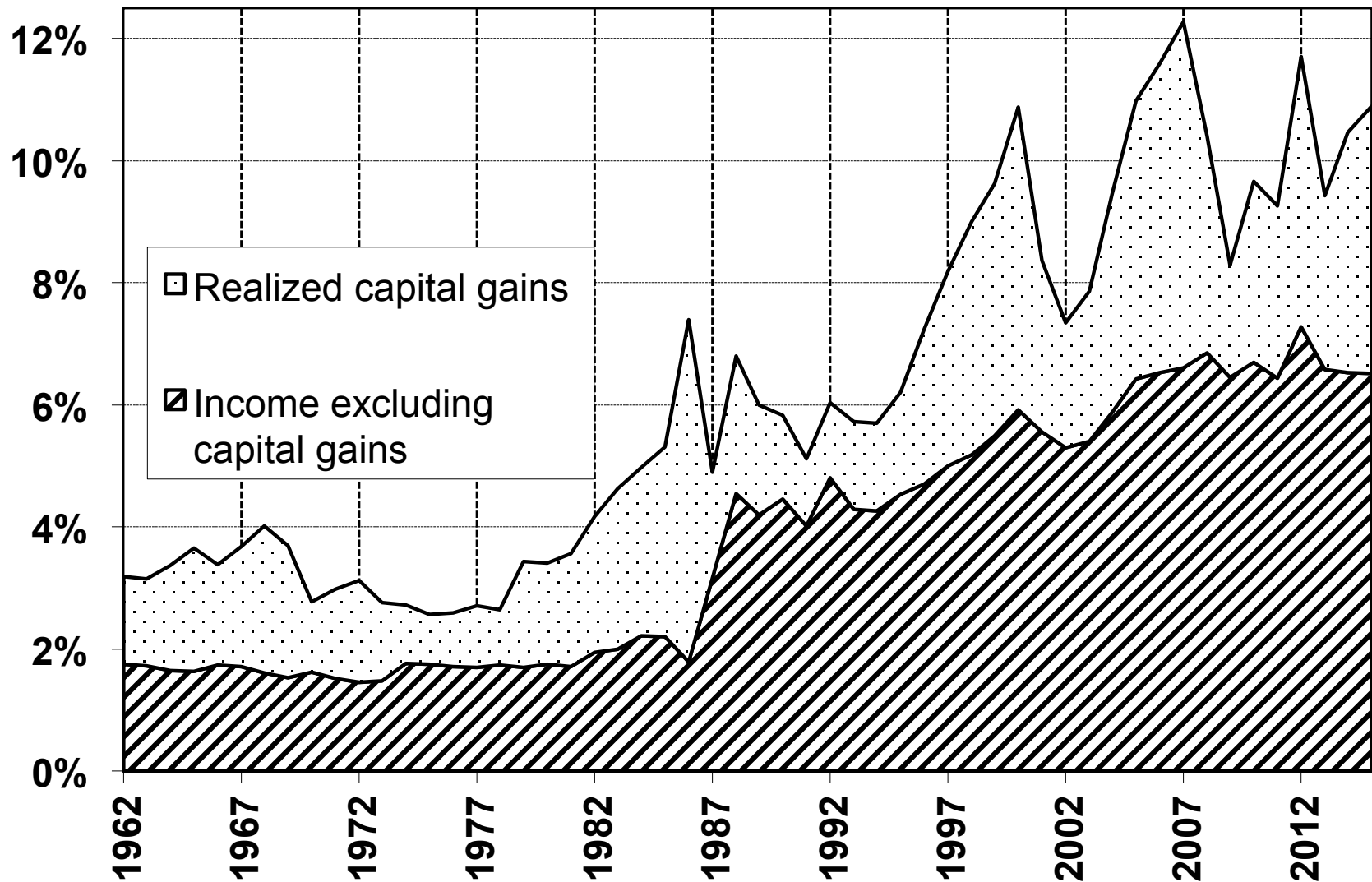
⇒ Short-term elasticity is very large but long-term elasticity is certainly much smaller

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.

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.

Inter-Temporal Substitution: Stock-Options

Goolsbee JPE'00 analyzes CEO pay around the 1993 Clinton top tax rate increase [from 31% in 1992 to 39.6% in 1993 announced in late 1992]

Finds a strong re-timing response through stock-option exercise (executives can choose the timing of their stock-option exercises)

⇒ Large short-term response due to re-timing, small long-term response

The 2013 Obama top tax rate increase has also generated income shifting from 2013 to 2012 (Saez '17)

TABLE 2
 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.

STOCK OPTIONS

Major form of compensation of US top executives. Theoretical goal is to motivate executives to increase the value of the company (stock price $P(t)$)

Stock-options granted at date t_0 allow executives to buy N company shares at price $P(t_0)$ on or after t_1 (in general $t_1 - t_0 \simeq 3 - 5$ years = vesting period)

Executive exercise option at (chosen) time $t_2 \geq t_1$: pays $N \cdot P(t_0)$ to get shares valued $N \cdot P(t_2)$. Exercise profit $N[P(t_2) - P(t_0)]$ (considered and taxed as wage income in the US)

After t_2 , executive owns N shares, eventually sold at time $t_3 \geq t_2$: realized capital gain $N[P(t_3) - P(t_2)]$ (taxed as capital gains)

Income Shifting: Corporate And Individual Tax Base

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

Corporate profits are first taxed by corporate tax [tax rate τ_c]

Net-of-tax profits are taxed again when finally distributed to shareholders. 2 distribution options:

a) dividends [tax rate τ_d]

b) retained profits increase stock price: shareholders realize capital gains when finally selling the stock [tax rate τ_{cg}]

For **unincorporated businesses** (sole proprietorships, partnerships, S-corporations) profits are taxed directly and solely as individual income (rate τ_i)

CORPORATE AND INDIVIDUAL TAX BASE

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

US fed taxes in 2016: $\tau_c = 35\%$, $\tau_{cg} = 20\%$ (less because of deferral value), $\tau_d = 20\%$, $\tau_i = 39.6\%$, (top rate)

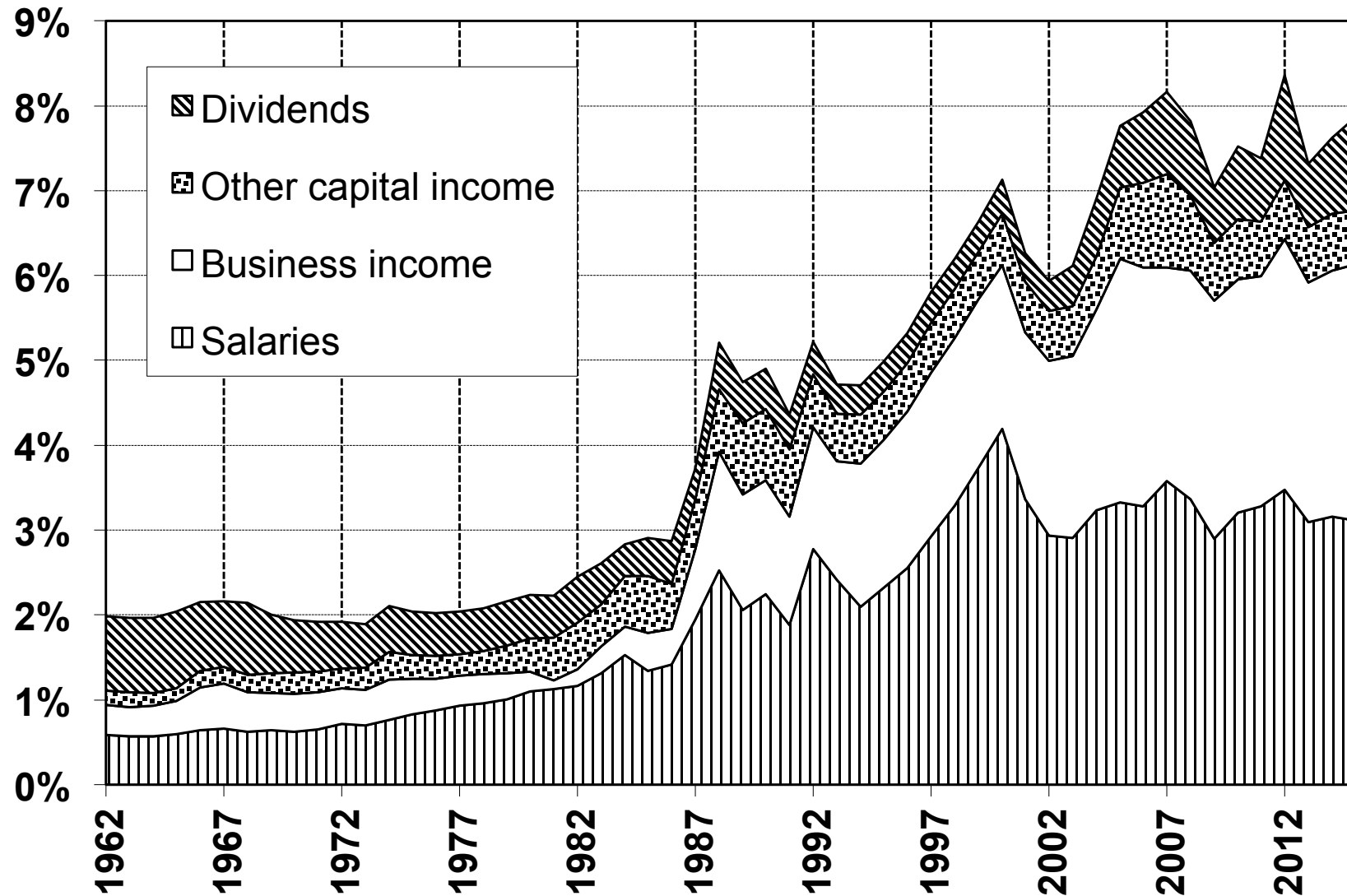
Today, individual form is best

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 excluding 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 ⇒ International evidence can cast further useful evidence

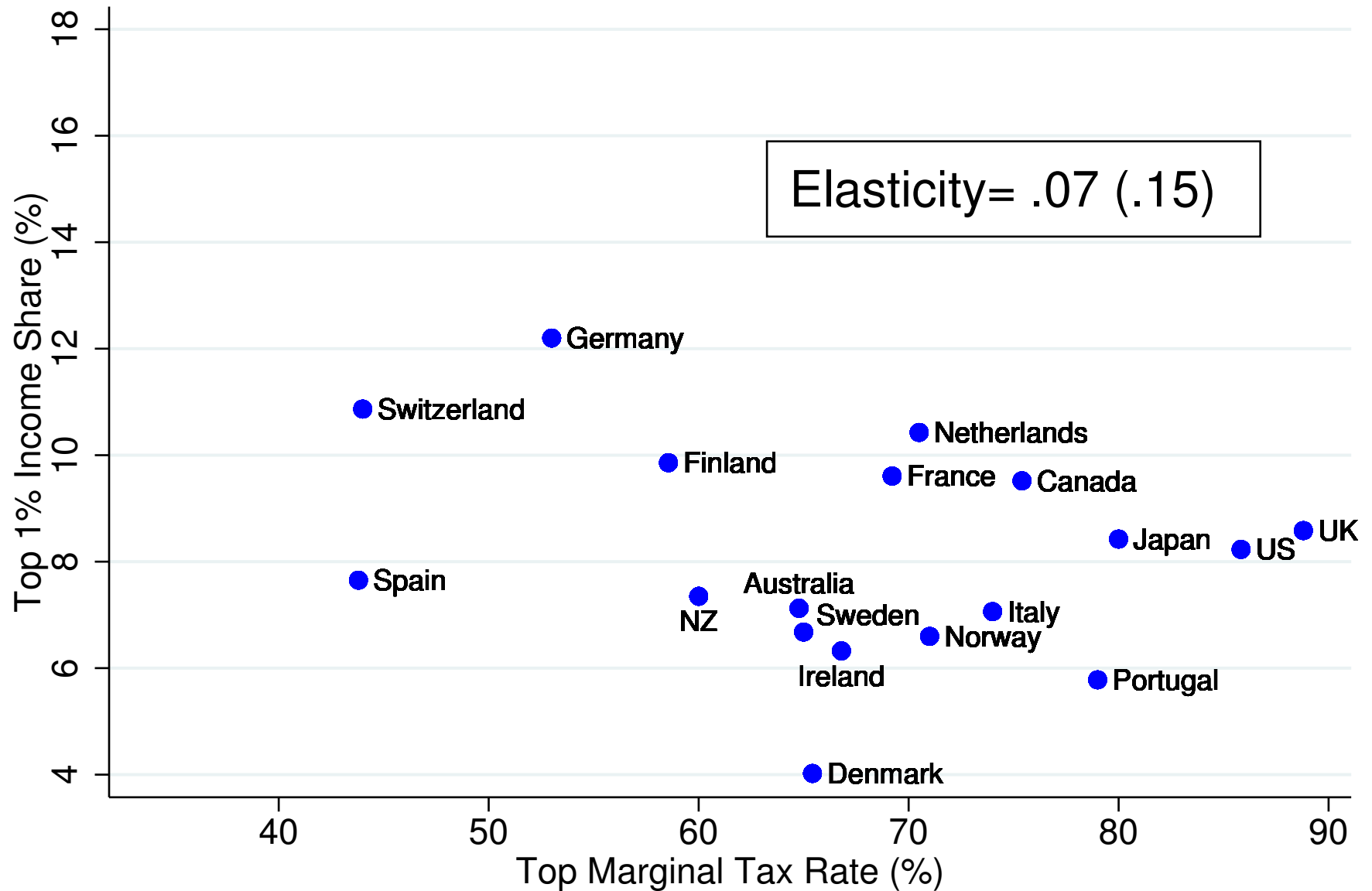
TOP RATES AND TOP INCOMES INTERNATIONAL EVIDENCE

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

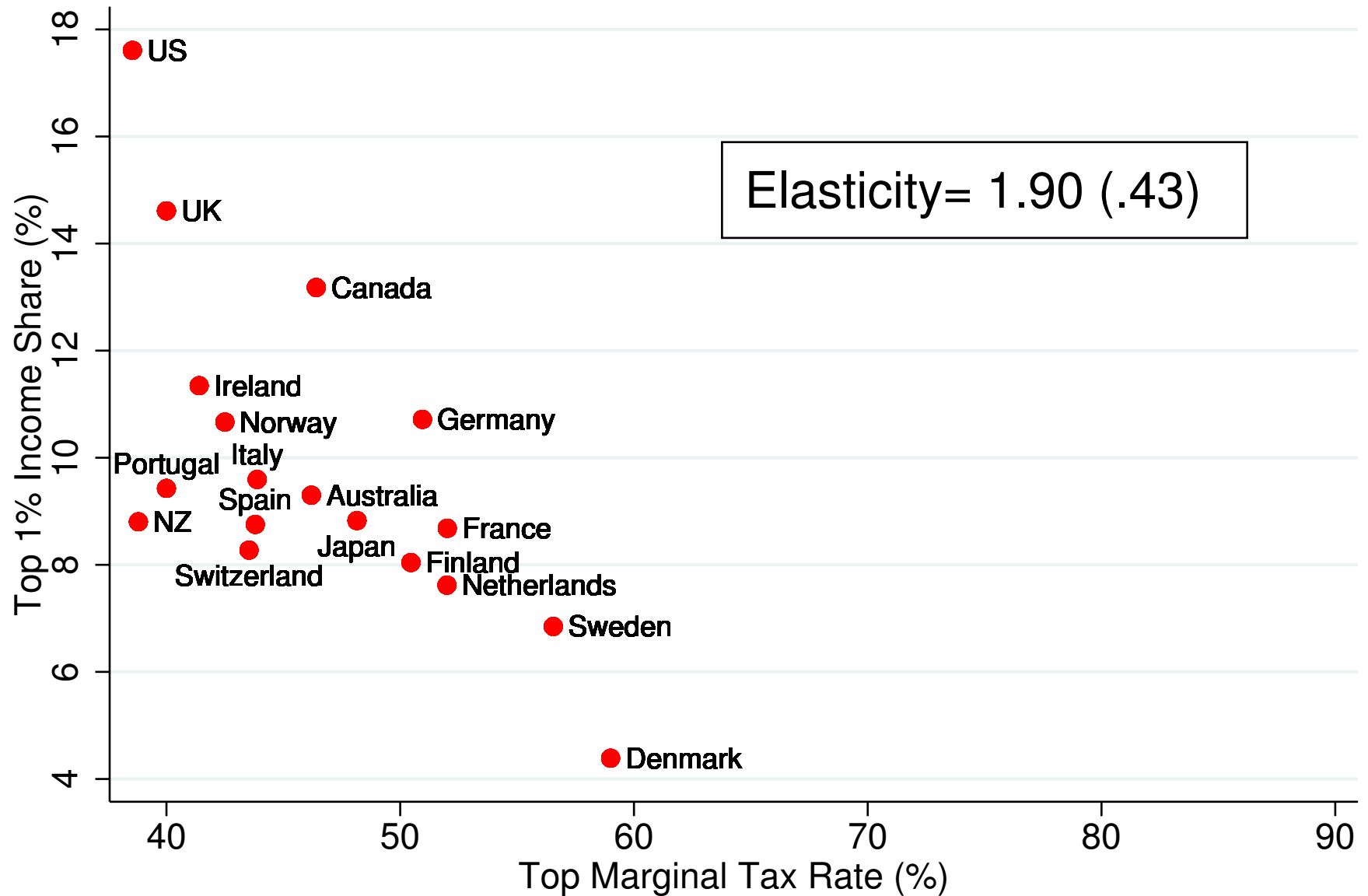
2) Compute top (statutory) individual income tax rates using OECD data [including both central and local income taxes].

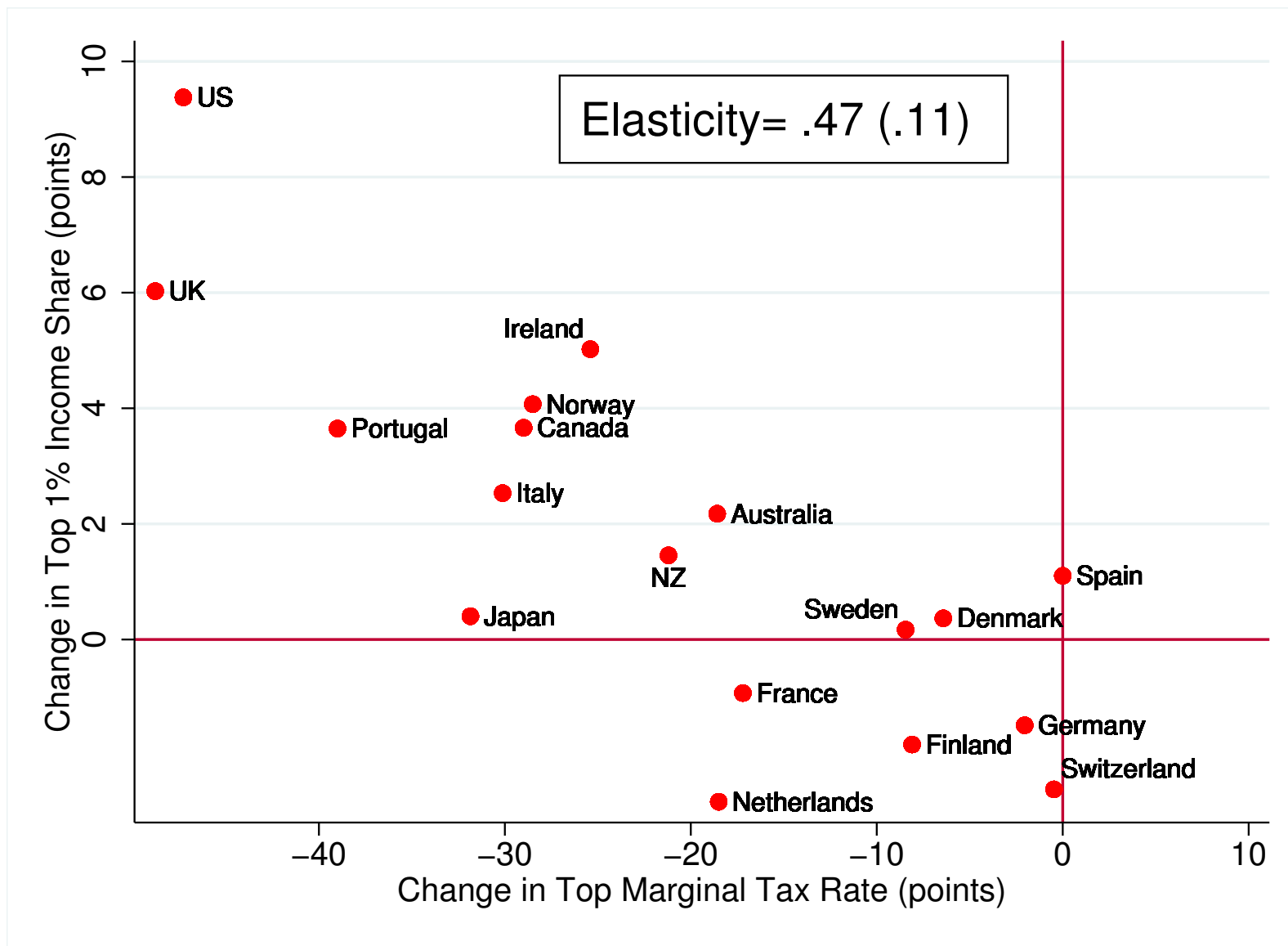
Plot top 1% pre-tax income share against top MTR in 1960-4, in 2005-9, and 1960-4 vs. 2005-9

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

3 potential scenarios with very different policy consequences

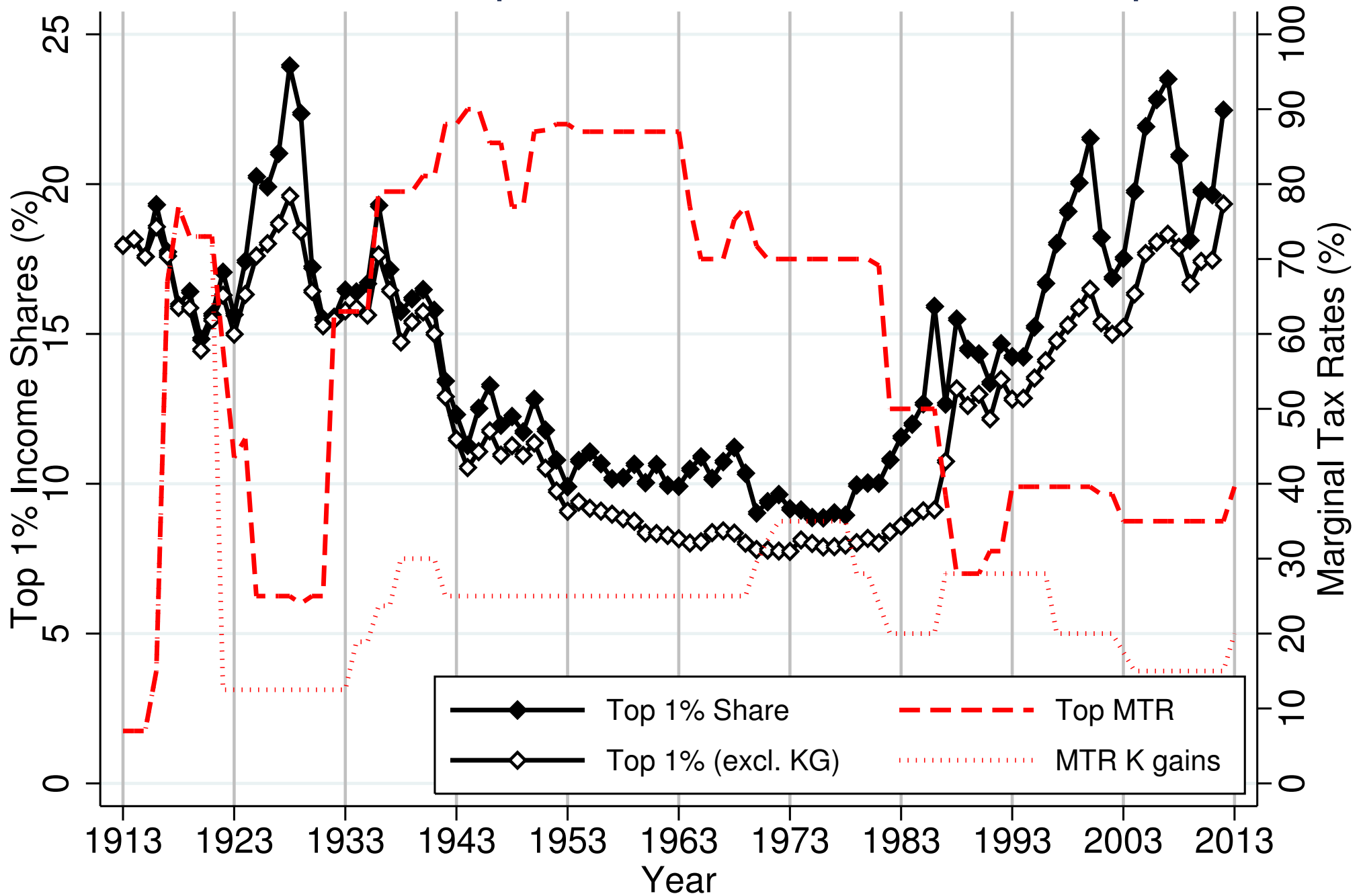
1) Supply-Side: Top earners work less and earn less when top tax rate increases \Rightarrow Top tax rates should not be too high

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 earners extract more pay (at the expense of the 99%) when top tax rates are low \Rightarrow High top tax rates are desirable

Tax Avoidance: Top 1% Income Shares and Top MTR



Real changes vs. tax Avoidance? Charitable giving

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

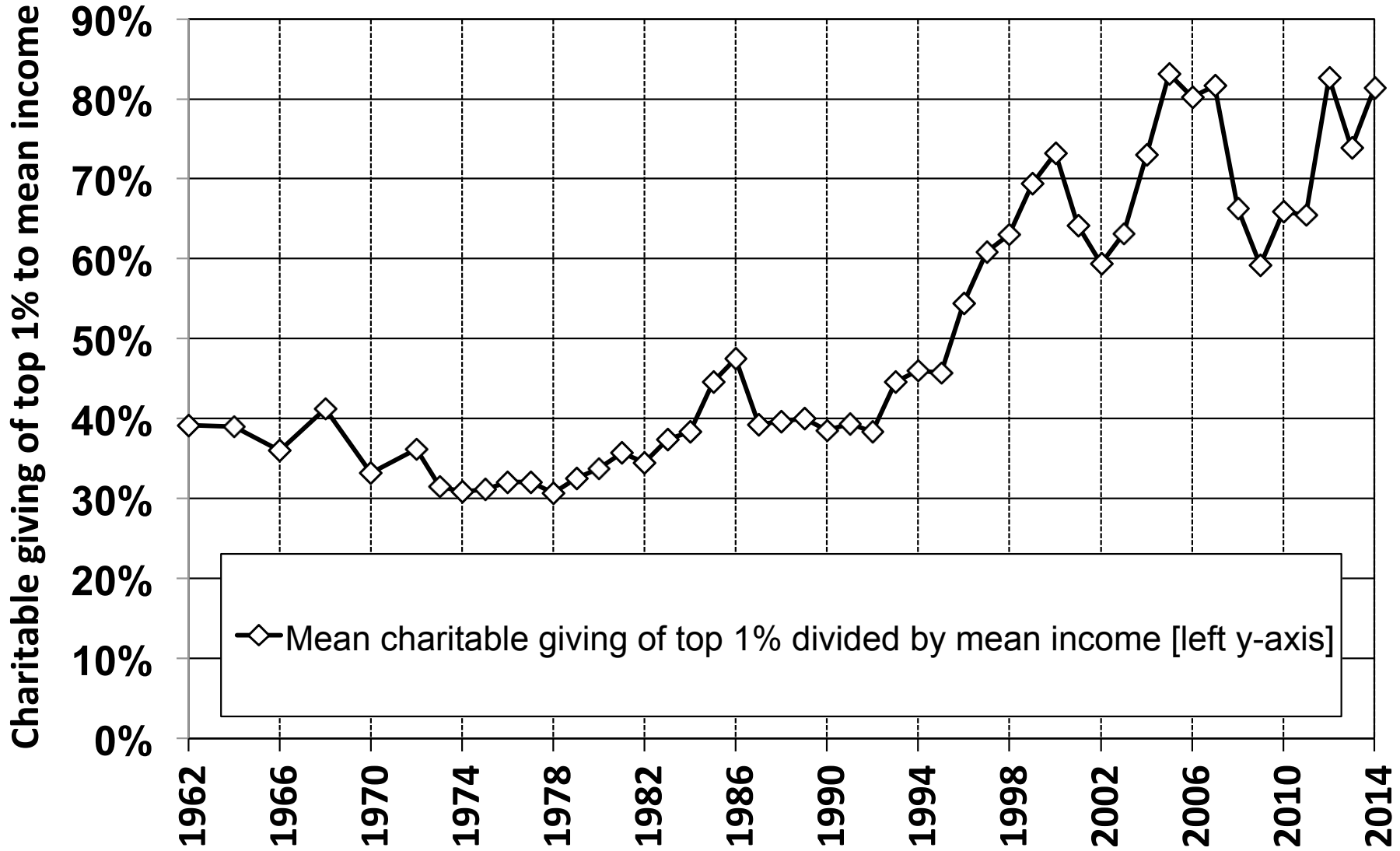
Because charitable is tax deductible, incentives to give are stronger when tax rates are higher

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

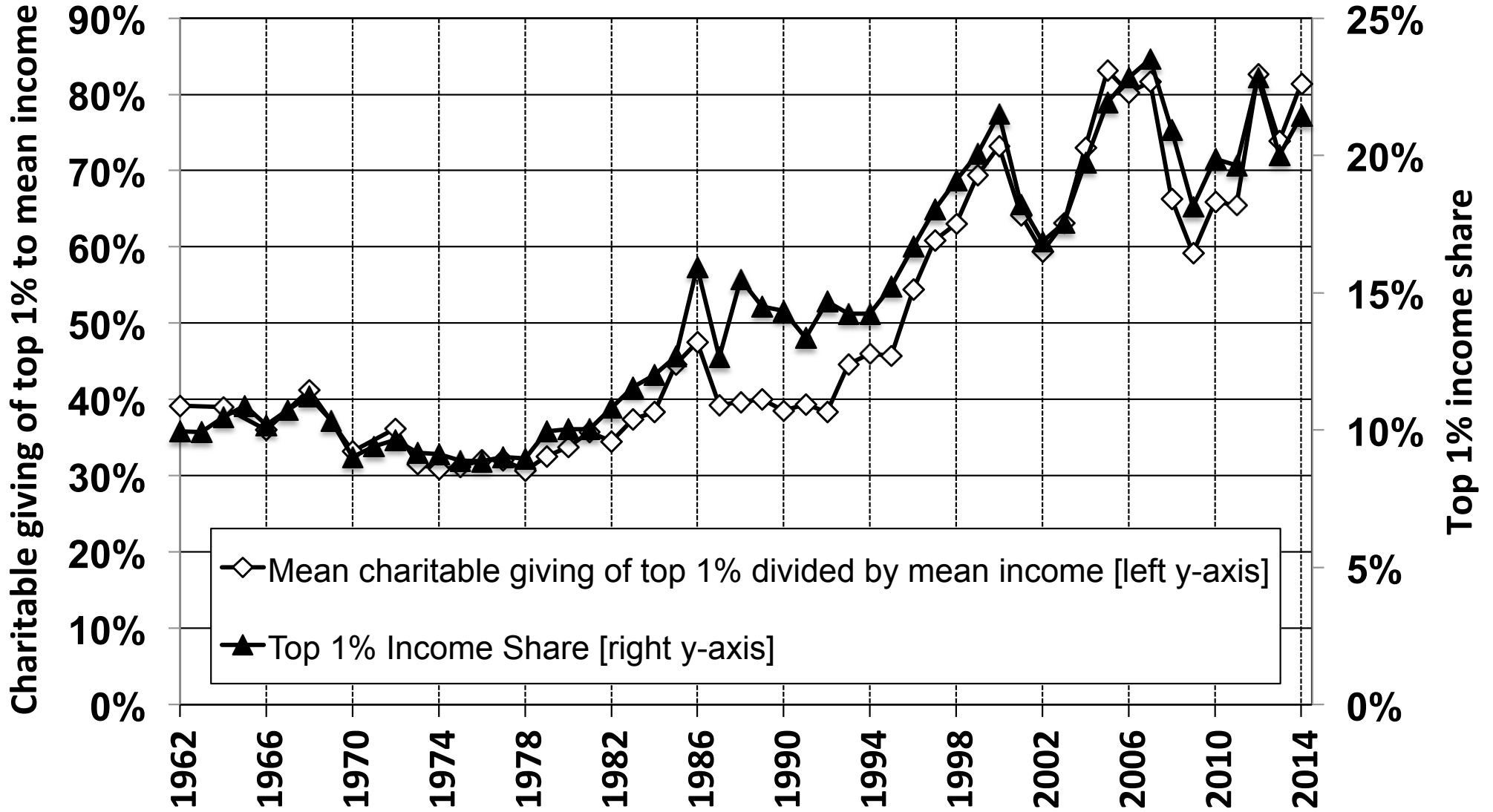
⇒ Incomes at the top have grown for real

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)

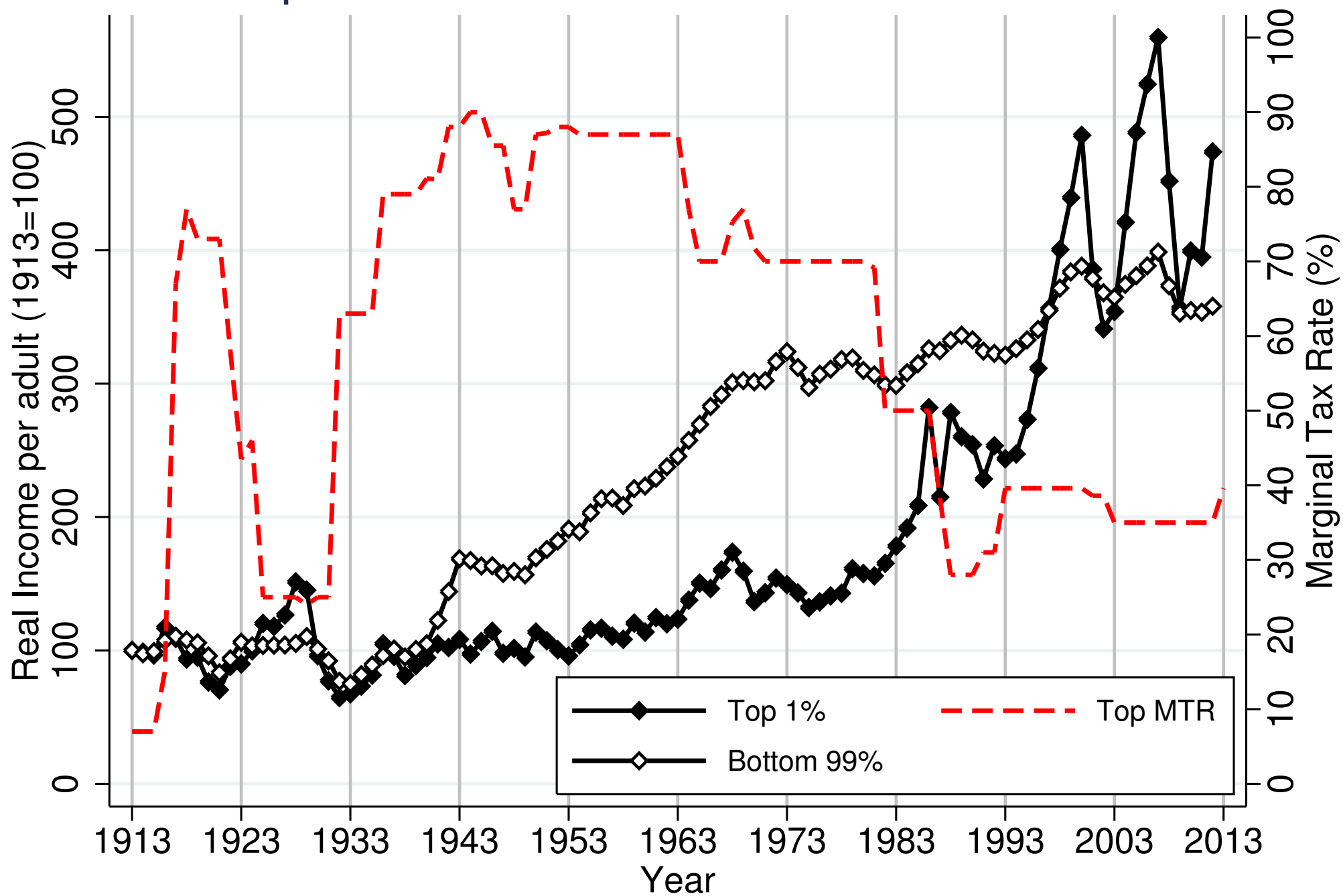
Two macro-preliminary tests:

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



INTERNATIONAL CEO PAY EVIDENCE

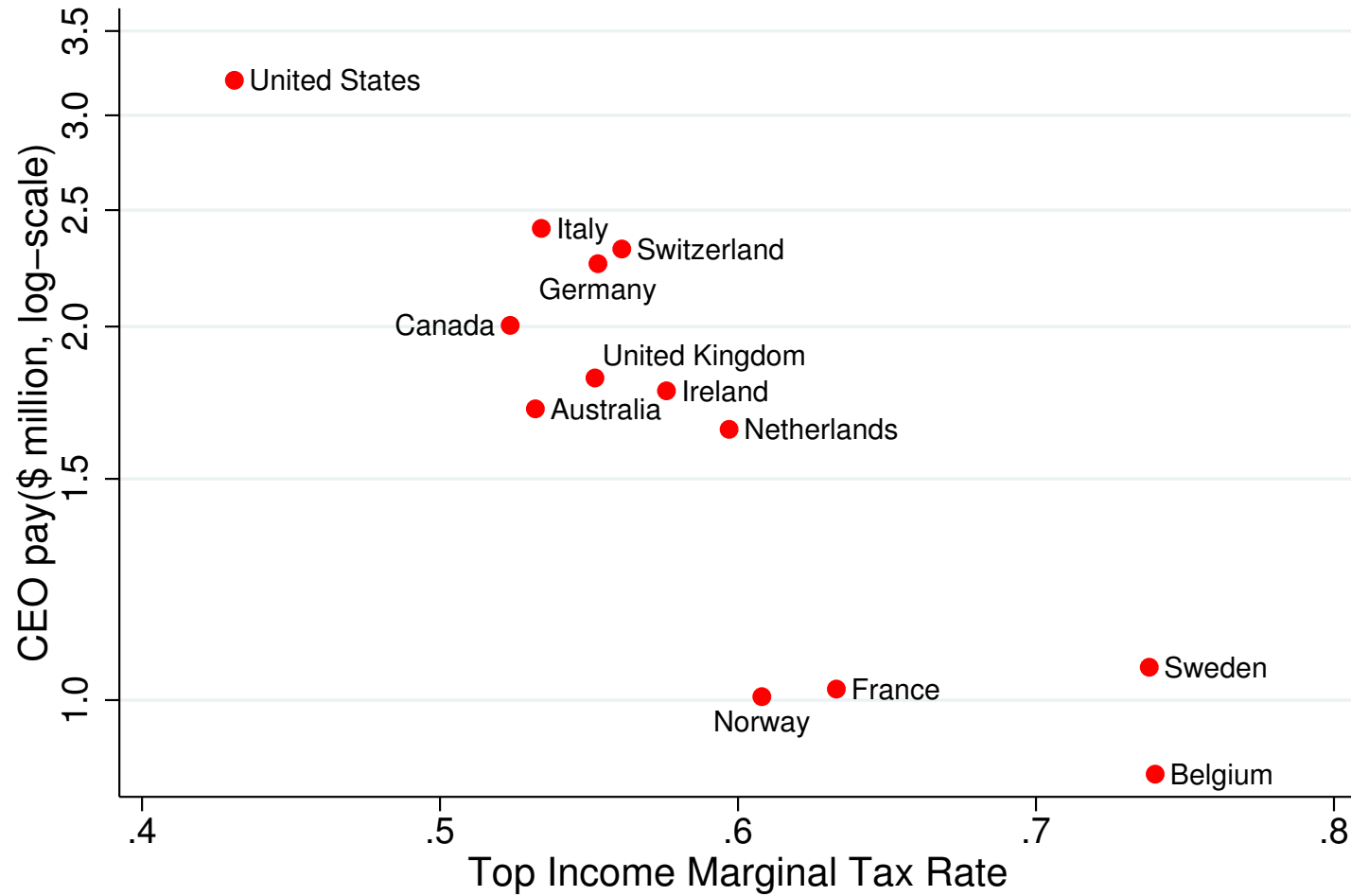
Recent micro-data for 2006 gathered by Fernandes, Ferreira, Matos, Murphy RFS'12.

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

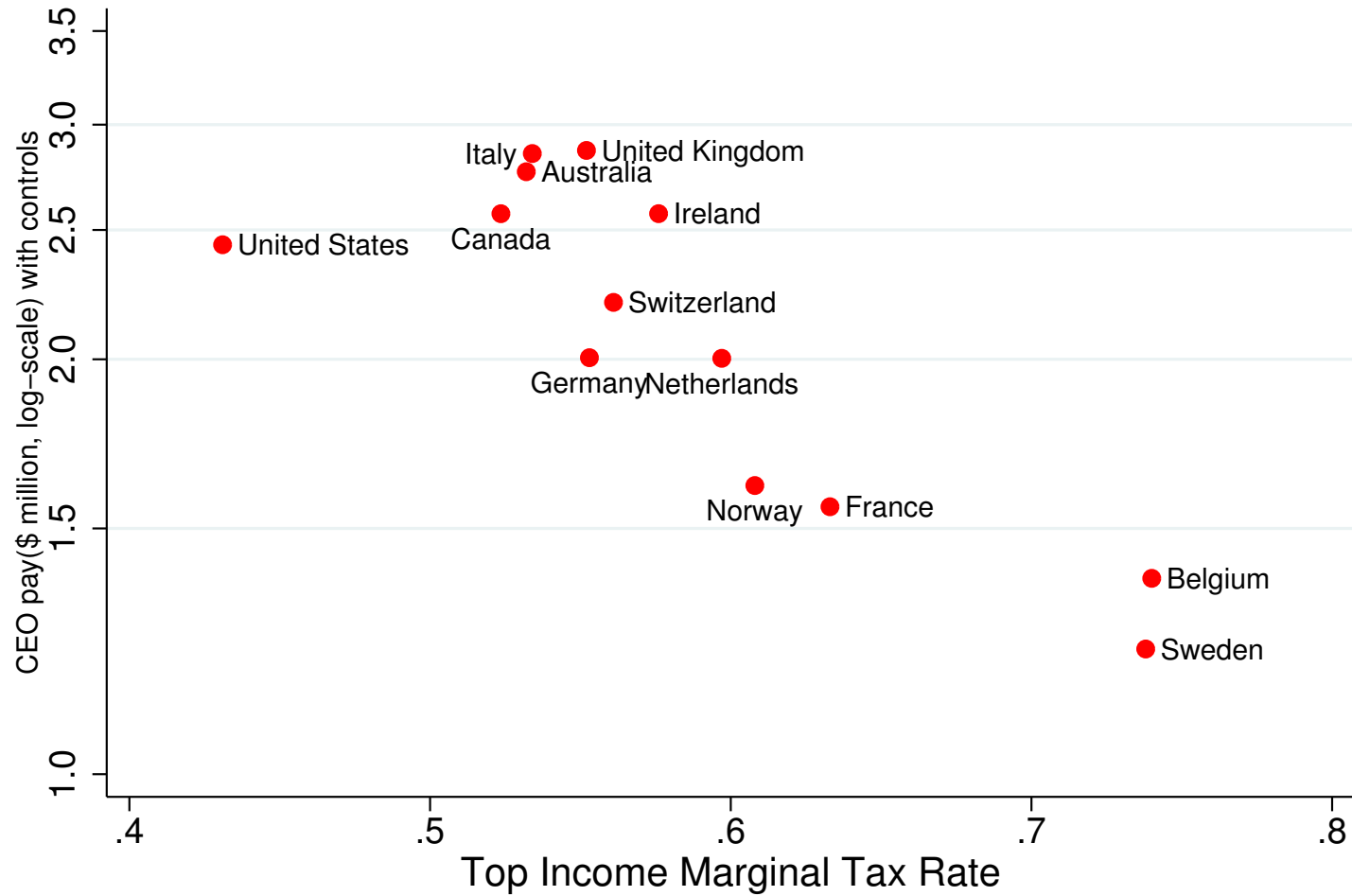
⇒ Consistent with rent-seeking effects

A. Average CEO compensation



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

B. Average CEO compensation with controls



Controlling for firm profitability, governance, size, and industry

Tax Induced International Migration

Public debate concern that top skilled individuals move to low tax countries (e.g., in EU context) or low tax states (within US Federation, see Moretti-Wilson AER17, Young et al. 16)

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

Little work on tax induced international migration of top skilled workers

Hard to get data but 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 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

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

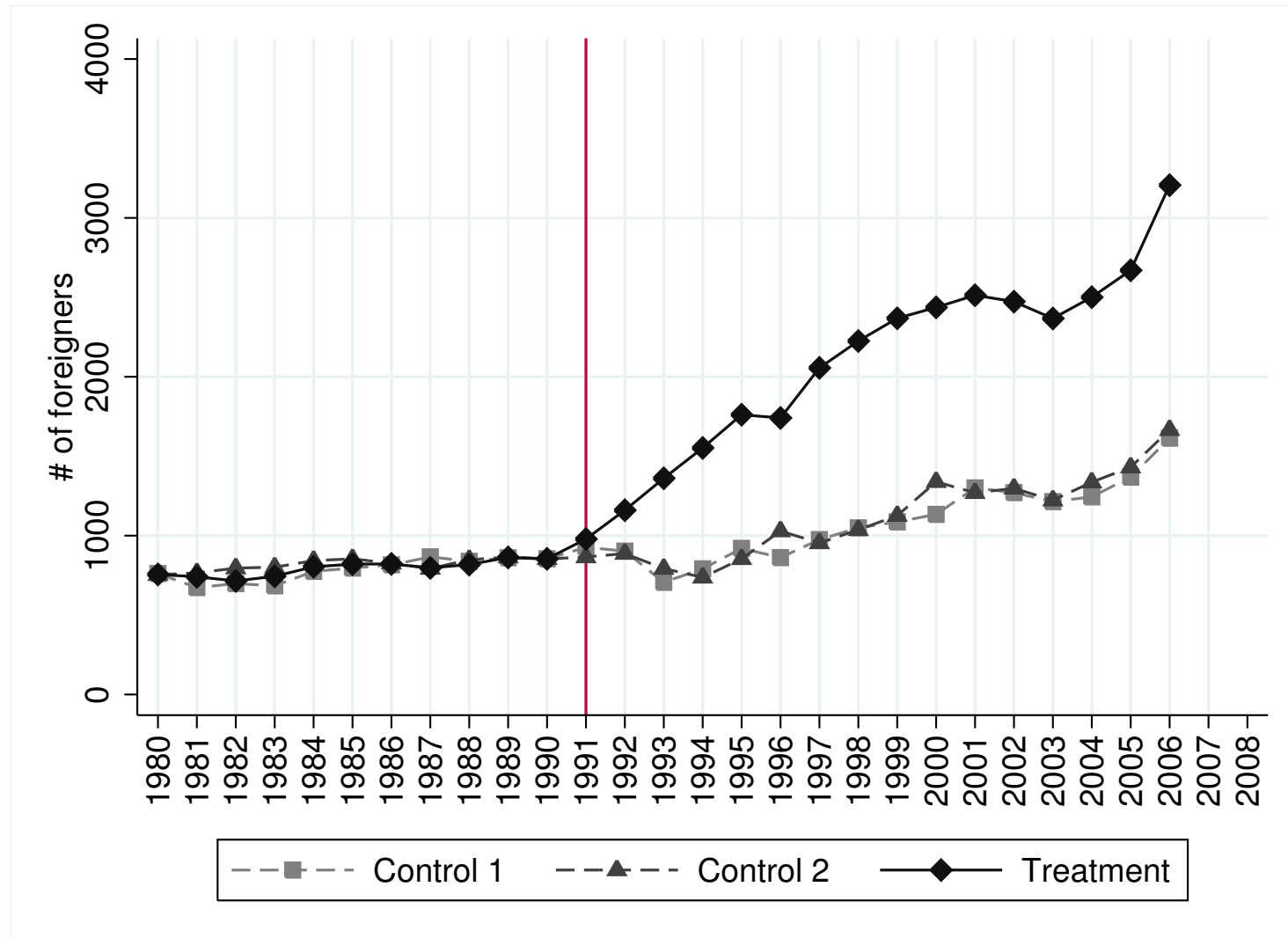
Use population wide Danish tax data and DD strategy: compare immigrants above eligibility earnings threshold (treatment) to immigrants slightly below threshold (control)

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

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

⇒ 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.

REFERENCES

Akcigit, Ufuk , Salomé Baslandze, and Stefanie Stantcheva. “Taxation and the International Mobility of Inventors” , *American Economic Review* 106 (10), 2016, 2930–2981 (web)

Alvaredo, F., T. Atkinson, T. Piketty, E. Saez, G. Zucman *The World Wealth and Income Database*, (web)

Atkinson, A., T. Piketty and E. Saez “Top Incomes in the Long Run of History” , *Journal of Economic Literature*, 49(1), 2011, 3-71. (web)

Department of the Treasury(2012) “Capital Gains and Taxes Paid on Capital Gains” (web)

Fernandes, Nuno, et al. “Are US CEOs paid more? New international evidence.” , *Review of Financial Studies* 26.2, 2013, 323-367.(web)

Goolsbee, A. “What Happens When You Tax the Rich? Evidence from Executive Compensation” , *Journal of Political Economy*, Vol. 108, 2000, 352-378. (web)

IRS, Statistics of Income Division(2013) “U.S. Individual Income Tax: Personal Exemptions and Lowest and Highest Tax Bracket” (web)

Kleven, Henrik, Camille Landais, and Emmanuel Saez “Taxation and International Mobility of Superstars: Evidence from the European Football Market,” *American Economic Review*, 103(5), 2013. (web)

Kleven, Henrik Jacobsen, Camille Landais, Emmanuel Saez, and Esben Anton Schultz. “Migration and Wage Effects of Taxing Top Earners: Evidence from the Foreigners’ Tax Scheme in Denmark.” *Quarterly Journal of Economics* 127(1), (2014).(web)

Moretti, Enrico and Daniel Wilson 2017. “The Effect of State Taxes on the Geographical Location of Top Earners: Evidence from Star Scientists”, forthcoming *American Economic Review* (web)

Piketty, T. and E. Saez “Income Inequality in the United States, 1913-1998”, *Quarterly Journal of Economics*, Vol. 116, (2003): 1-39. (web)

Piketty, Thomas, Emmanuel Saez, and Stefanie Stantcheva “Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities,” *American Economic Journal: Economic Policy*, 6(1), 2014. (web)

Saez, Emmanuel Taxing the Rich More: Preliminary Evidence from the 2013 Tax Increase, NBER Working Paper No. 22798, November 2016, forthcoming *Tax Policy and the Economy*, ed. Robert Moffitt, (Cambridge: MIT Press), Volume 31, 2017. (web)

Saez, Emmanuel, Joel Slemrod, and Seth H. Giertz. "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review." *Journal of Economic Literature* 50(1) (2012): 3-50. (web)

Young, Cristobal, Charles Varner, Ithai Lurie, Richard Prisinzano, 2016 "Millionaire Migration and the Taxation of the Elite: Evidence from Administrative Data", *American Sociological Review* 81(3), 421–446 (web)