

Lecture 196:  
Income Inequality and Redistributive  
Policies

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## GENERAL INTRODUCTION

Free market economies generate substantial inequality  $\Rightarrow$  Main criticism of capitalism

Raises 2 important issues for economists:

1) Measuring and Understanding Inequality: What is the level of inequality, How it changes overtime, What factors drive inequality?

2) Does/Should the government reduce inequality using redistributive policies such as taxes, transfer programs, and other regulations?

## **PLAN FOR LECTURE**

1. Introduction and Definitions
2. Income Inequality: Facts and Explanations
3. Taxes and Redistribution

## Income Inequality: Labor vs. Capital Income

Individuals derive market income (before taxes/transfers) from **labor** and **capital**:  $z = wl + rk$  where  $w$  is wage,  $l$  is labor supply,  $k$  is assets,  $r$  is rate of return on assets

1) **Labor income inequality** is due to differences in working abilities (education, talent, physical ability, etc.), work effort (hours of work, effort on the job, etc.), and luck (labor effort might succeed or not)

2) **Capital income inequality** is due to differences in wealth  $k$  (due to past saving behavior and inheritances received), and in rates of return  $r$  (varies dramatically overtime and across assets)

Business income of entrepreneurs is a mix of labor and capital income

## **Income Inequality: Labor vs. Capital Income**

1. Capital Income (or wealth) is more concentrated than Labor Income: Top 1% wealth holders have 35% of total wealth. Top 1% labor income earners have about 12-14% of total labor income.
2. Labor income is around 80% of aggregate market income from National Accounts (capital income is 20%). Fairly constant overtime and across industrialized countries.

## Income Inequality Measurement

Inequality can be measured by indexes which are functions of the cumulated income distribution function (**cdf**):  $F(z) =$  fraction of individuals with income below  $z$ .

$F(z)$  increasing in  $z$ ,  $F'(z) = f(z)$  is called the density function

Percentile  $p$  of the distribution is income level  $z_p$  such that a fraction  $p$  of the population has income below  $z_p$ :  $F(z_p) = p$  or  $z_p = F^{-1}(p)$ .

Example: 99th percentile ( $p = .99$ ) is  $z_{.99} = \$400,000$ ): income level such as 99% of US families have income below  $z_{.99}$  and 1% of families have income above  $z_{.99}$ .

## Income Inequality Indices

Inequality can be measured by indexes which are functions of the cumulated income distribution function (**cdf**)

Most widely used inequality index: **Gini** Coefficient

Gini = 2 \* area between 45 degree line and Lorenz curve

**Lorenz** curve  $L(p)$  at percentile  $p$  is fraction of total income earned by individuals below percentile  $p$

$$0 \leq L(p) \leq p$$

Gini=0 means perfect equality, Gini=1 means complete inequality

## Kuznets' Theory of Labor Income Inequality

Kuznets theory: during economic development, there is a shift of workers from old sector (agriculture) where pay is low to new sector (industry) where pay is higher. Three stages:

1) Everybody works in low pay old sector  $\Rightarrow$  Inequality is low

2) Some workers have shifted to high pay new sector jobs  $\Rightarrow$  Inequality is higher

3) Everybody works in high pay new sector  $\Rightarrow$  Inequality is low again

Inequality follows an **inverted U-shape** during process of development



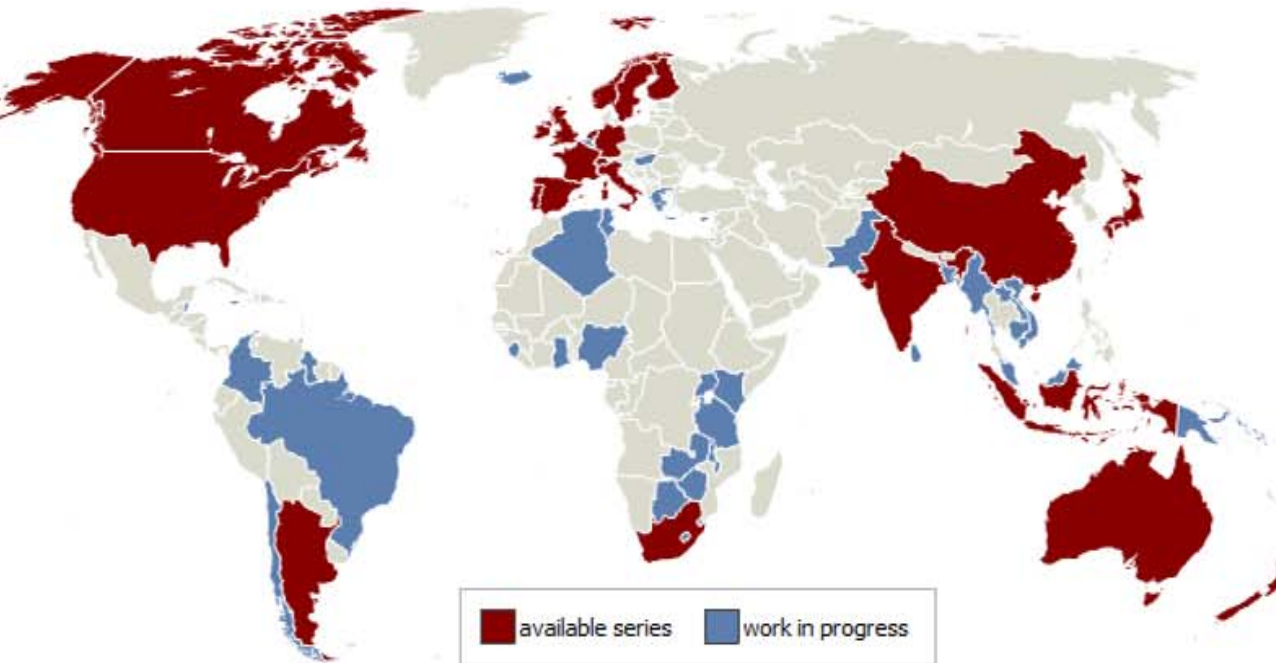
## INCOME INEQUALITY

We start by focusing specifically on top incomes and long periods of time. Aims of this section:

- 1) Summarize recent and collective effort to use income tax statistics to construct top income shares series across many countries covering long periods
- 2) Provide Plausible Interpretations of empirical patterns and prospects for future work

Literature is summarized in Atkinson-Piketty-Saez JEL'11 and data online in **The World Top Incomes Database**

# THE TOP INCOMES DATABASE



- Home
- Introduction
- The Database
- Graphics
- Country Information
- Work in Progress
- Acknowledgments



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## **MOTIVATION FOR USING TAX STATISTICS**

General dissatisfaction with current cross-country income distribution databases (such as World Bank database):

1. Data is not homogeneous over time and across countries
2. Data do not cover long periods of time and available for isolated years
3. Data do not decompose labor income vs. capital income components
4. Data based on surveys and do not cover the top of distribution well

## **ADVANTAGE OF TAX STATISTICS**

Individual income tax data can be used to construct better inequality series:

1. Tax data covers long-periods of time and is annual (US, 1913-; Japan 1887-; UK 1908-; France 1914-)
2. Tax data is relatively homogenous within a country
3. Tax data provides clear picture of the top of the distribution
4. Tax data often provides composition of incomes (wages, business income, capital income)

## LIMITATION OF TAX STATISTICS

Individual income tax data also suffers from important limitations:

1. Tax data often covers only the top part of the distribution but not bottom or middle  $\Rightarrow$  Can only construct top income shares but not Gini indexes
2. Tax data is based on reported incomes and might be biased because of tax evasion and tax avoidance  $\Rightarrow$  Need to study tax changes carefully [more on this later]
3. Definition of income reported for tax purposes varies across countries and may change overtime

## **DATA USED TO ESTIMATE TOP INCOME SHARES**

1) Individual Income Tax statistics:

a) Typically report number of taxpayers, amount and composition of income by income brackets

b) Very high top brackets based on 100% sample

2) Census population data to estimate the total number of families in the population

3) National Accounts data to construct total personal income denominator

## METHODOLOGY (KUZNETS 1953)

- 1) Define upper groups such as top 10% or top 1%, top 0.1% relative to total number of adults or families in the population
- 2) Use published tabulations by income brackets and simple Pareto interpolation methods to estimate income earned by a given upper group
- 3) Divide income earned by top group by total personal income to obtain top income shares
- 4) Large number of adjustments needed to correct for exemptions, changes in income definition, etc.

## Data for 1885, the first tax year in Japan

<b>Income brackets (Yen)</b>	<b>Number of taxpayers</b>	<b>Income ('000s of Yen)</b>	<b>Tax ('000s of Yen)</b>
300-1000	105,217	47,000	470
1000-10,000	13,061	25,667	385
10,000-20,000	209	2,621	52
20,000-30,000	44	1,029	26
30,000 and above	63	4,067	122
Total	118,594	80,383	1,055



## Illustration of the Pareto Interpolation Method

Income brackets	# Taxpayers	Income
300-1000	105,217	47,000
1000 and above	13,377	33,384

In 1885, there were 21,853,000 adults in Japan

Top 0.1% is the top 21,853 taxpayers

Top 0.1% Threshold falls in 300-1000 bracket

Assume Pareto distribution  $1-F(z)=k/z^a$

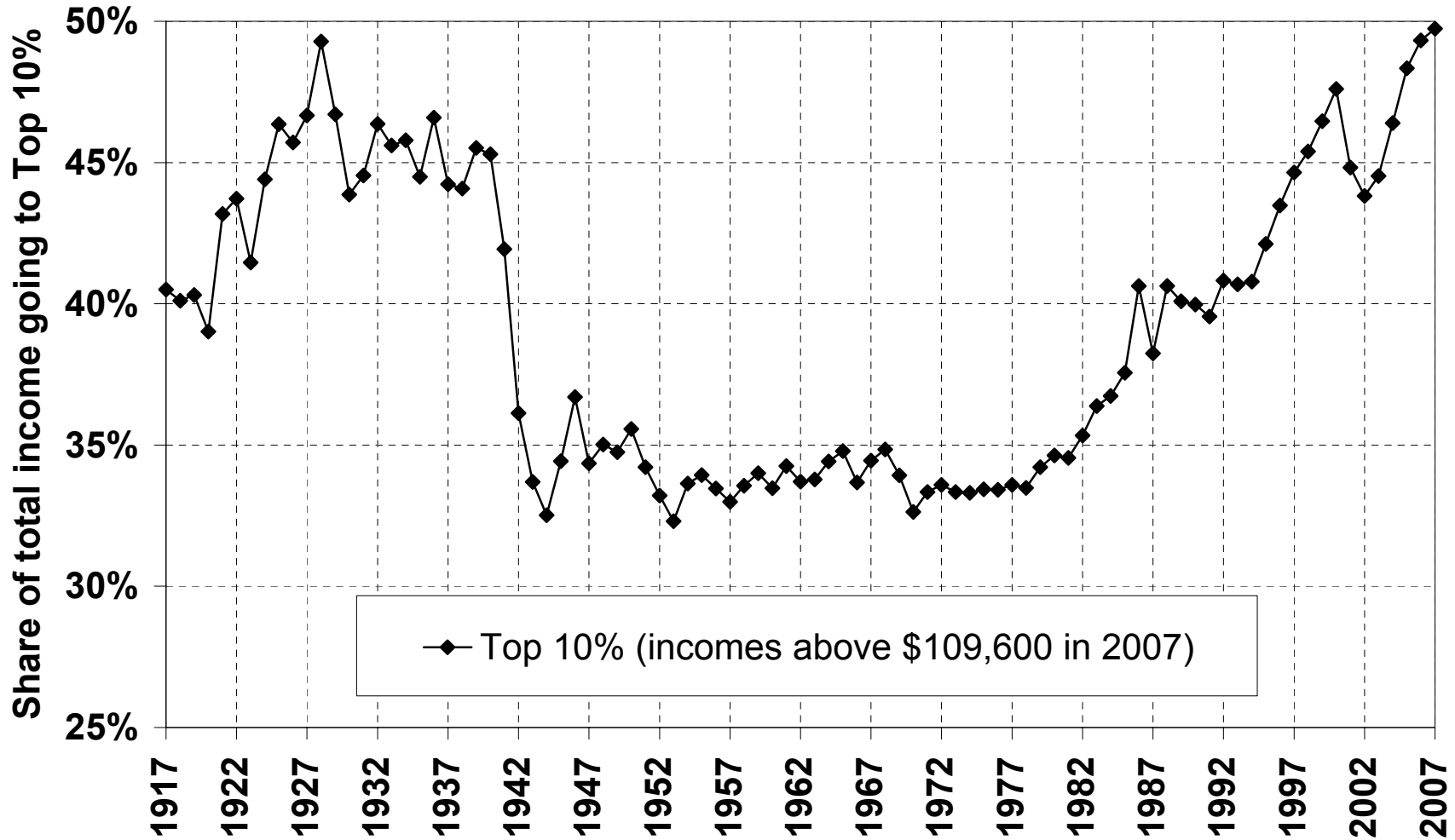
Top 0.1% Threshold is estimated as **763** Yen

Top 0.1% total income is:  $33384 + \mathbf{9827} = 43211$

Total personal income is 598500 K Yen

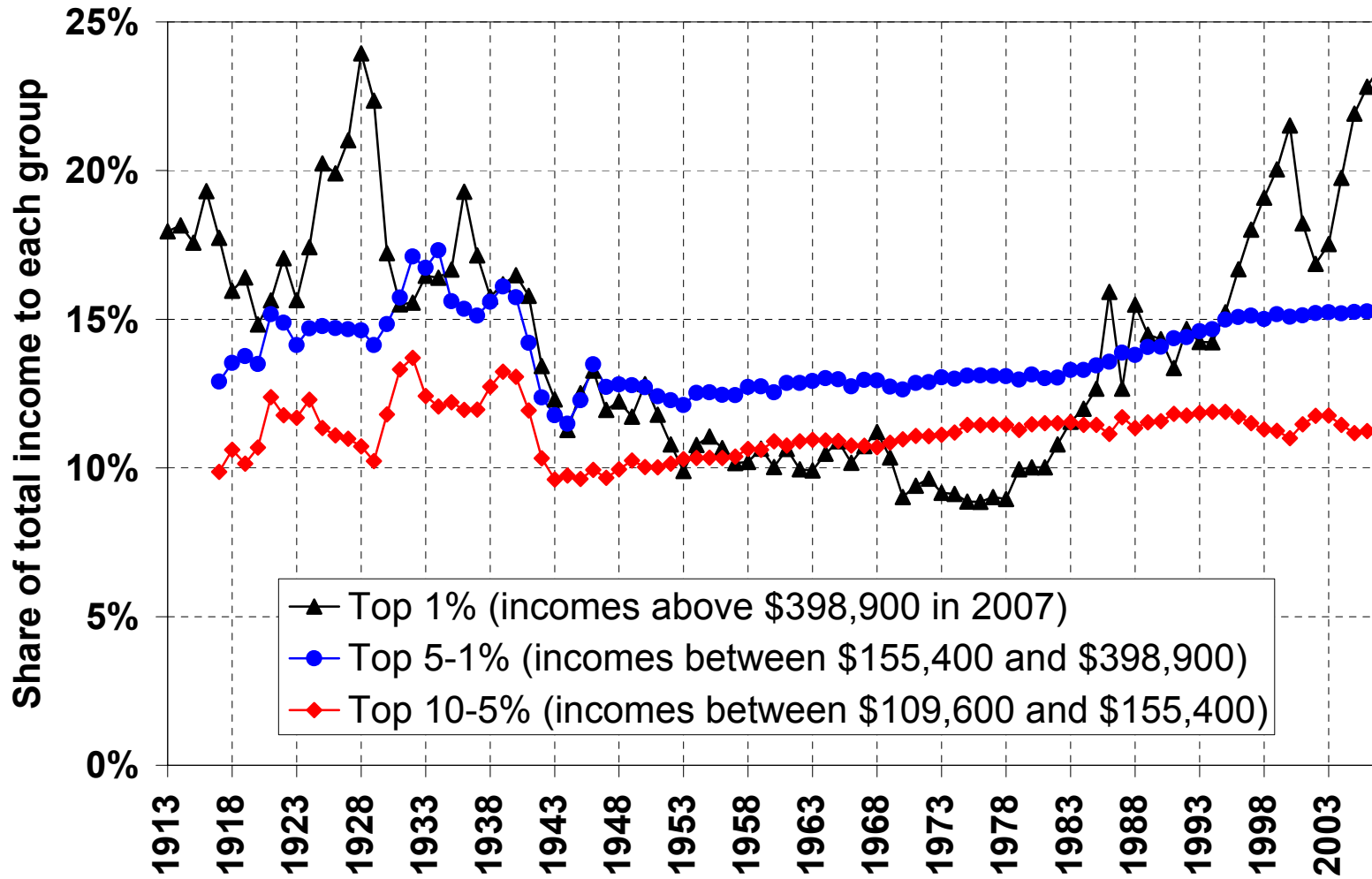
Top 0.1% income share is:  $43211 / 598500 = 7.2\%$

# 1. US Top Decile Income Share, 1917-2007



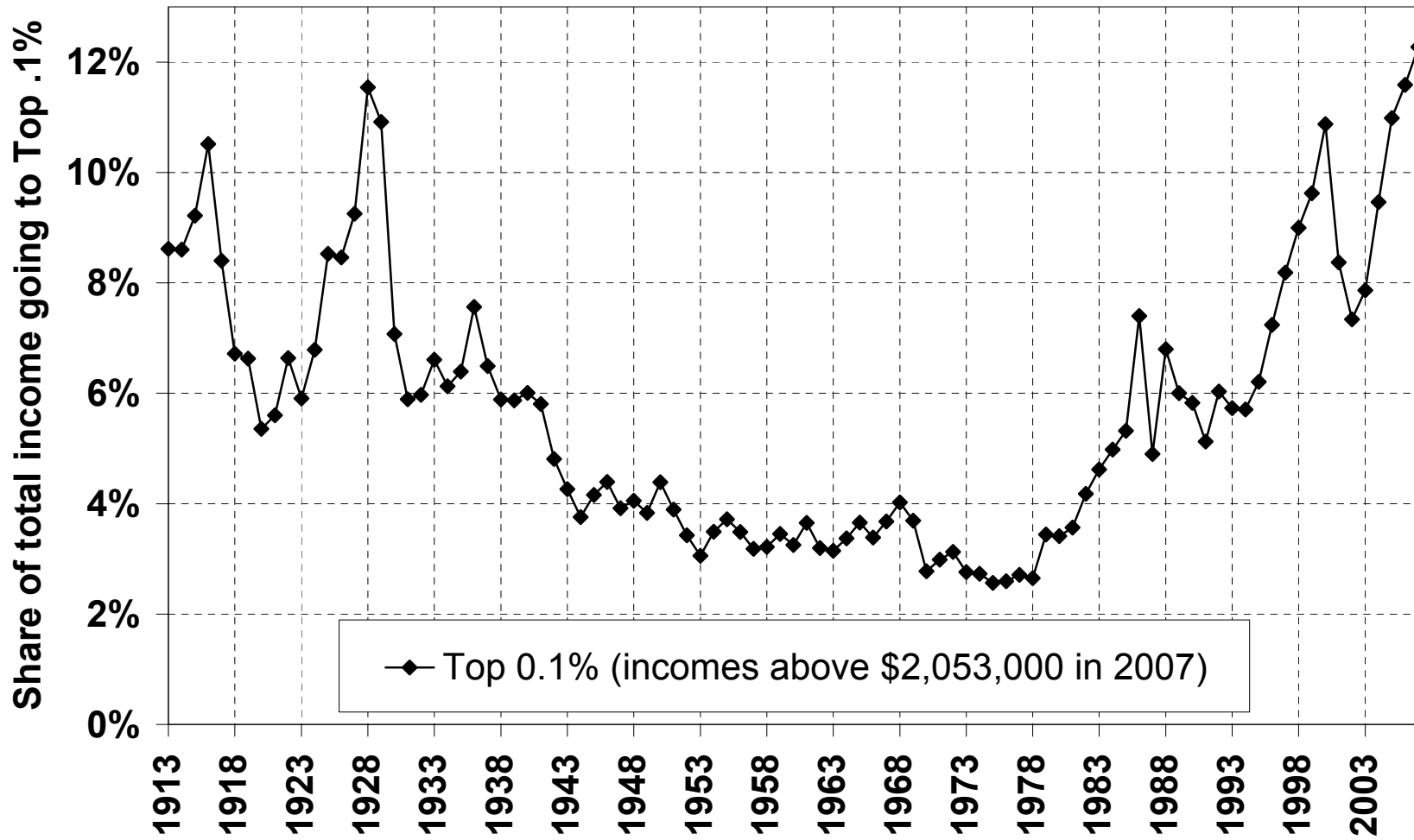
Source: Piketty and Saez QJE'03, updated to 2007, pre-tax cash market income including capital gains

## 2. Decomposing US Top Decile, 1913-2007



Source: Piketty and Saez QJE'03, updated to 2007, pre-tax cash market income including capital gains

### 3. US Top 0.1% Income Share, 1913-2007



Source: Piketty and Saez QJE'03, updated to 2007, pre-tax cash market income including realized capital gains

## 1. Top Percentile Share and Average Income Growth in the US

	Average Income Real Growth	Top 1% Incomes Real Growth	Bottom 99% Incomes Real Growth	Fraction of total growth captured by top 1%
Period 1976-2007	43%	279%	20%	58%
Clinton Expansion 1993-2000	31%	99%	20%	45%
Bush Expansion 2002-2007	16%	62%	7%	65%

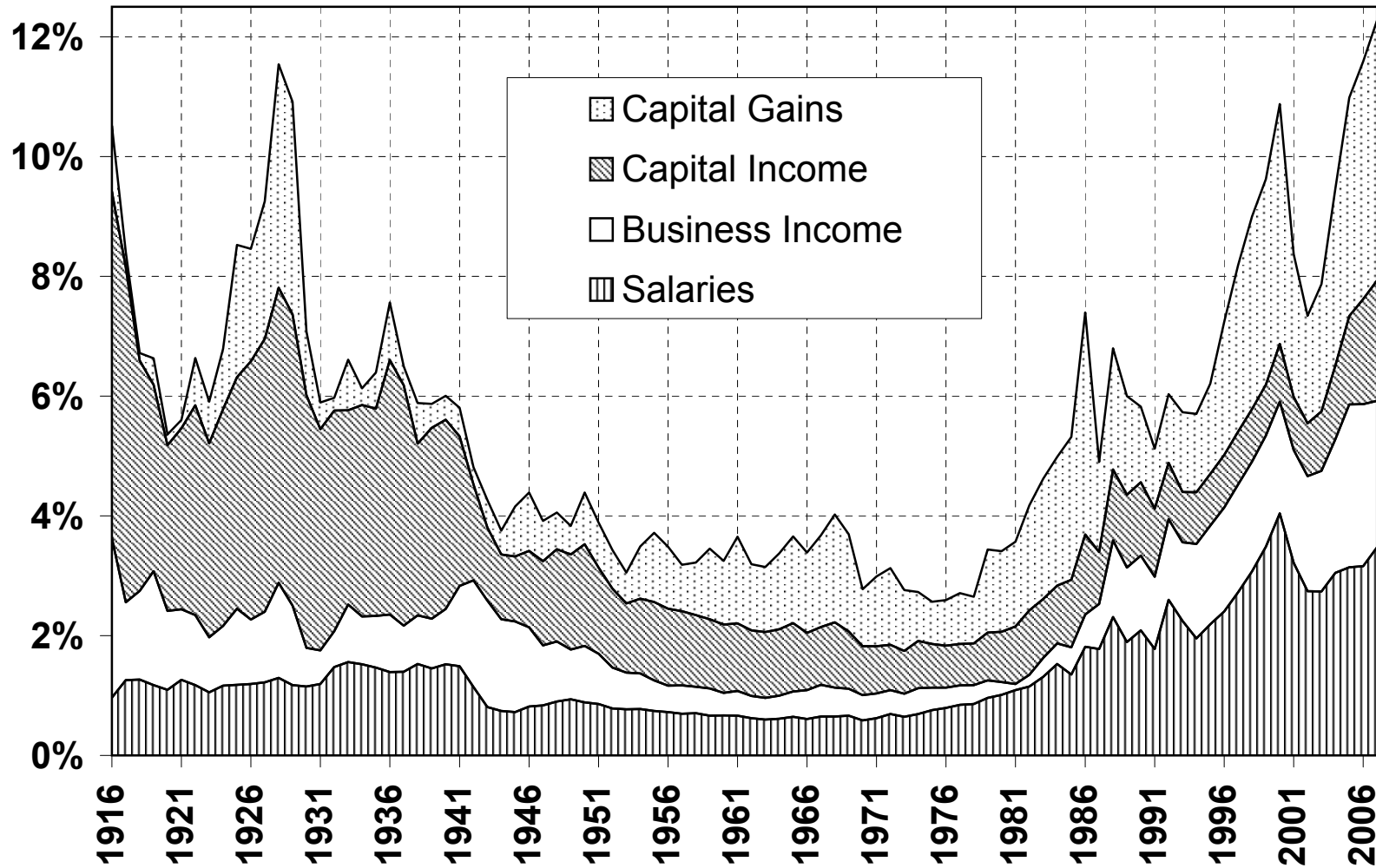
Computations based on family market income including realized capital gains (before individual taxes).

Incomes are deflated using the Consumer Price Index (and using the CPI-U-RS before 1992).

Column (4) reports the fraction of total real family income growth captured by the top 1%.

Source: Piketty and Saez (2003), series updated to 2007 in August 2009 using final IRS tax statistics.

## US Top 0.1% Income Share and Composition



Source: Piketty and Saez QJE'03, updated to 2007

## WHY DO TOP INCOME SHARES MATTER?

- 1) Top 1% get large share of total income (23.5% in the US in 2007)
- 2) Top 1% pay even larger fraction of taxes (40% in the US in 2007).
- 3) Top 1% surge accounts for a large fraction of US economic growth: If you exclude top 1%, US growth looks similar to European growth
- 4) Over 2002-2007, US growth has been 3%/year but bottom 99% incomes have grown only 1%/year  $\Rightarrow$  US public complains about gains of the rich

## WHY DO TOP INCOME SHARES MATTER?

- 1) Top 1% income share  $S$  has large effect on Gini:  $G = S + (1 - S) * G_0$  where  $G_0$  is Gini in bottom 99
- 2) Example: With  $G_0 = .4$ ,  $S$  increasing from 9% to 23% implies that  $G$  increases by .08
- 3) US survey data (which cannot measure top 1% because of small sample and top coding) shows that Gini increased from 0.39 in 1970 to 0.46 in 2005
- 4) Accounting for the Top 1% surge **doubles** the Gini increase since 1970 relative to official census reports



## SUMMARY OF US RESULTS

- 1) Dramatic reduction in income concentration during the first part of the 20th century. This is a capital income phenomenon concentrated within top 1% (confirmed with estate tax statistics)
- 2) No Recovery in the 2 decades following World War II
- 3) Sharp increase in top income shares since 1970s (again concentrated within top 1%) but this is primarily a labor income phenomenon (CEO and executive pay)
- 4) Top 1% income share in 2005 is similar to top 1% share in 1920s but “working rich” have partly replaced “rentiers” at the top of the US income distribution

## WHAT TO EXPECT NEXT?

1) **Short Run:** Top income shares have fallen during “Great Recession” of 2008-2009 because business profits, dividends, capital gains, stock-options and bonuses fall more than average income [Great Depression and Recent Recessions]

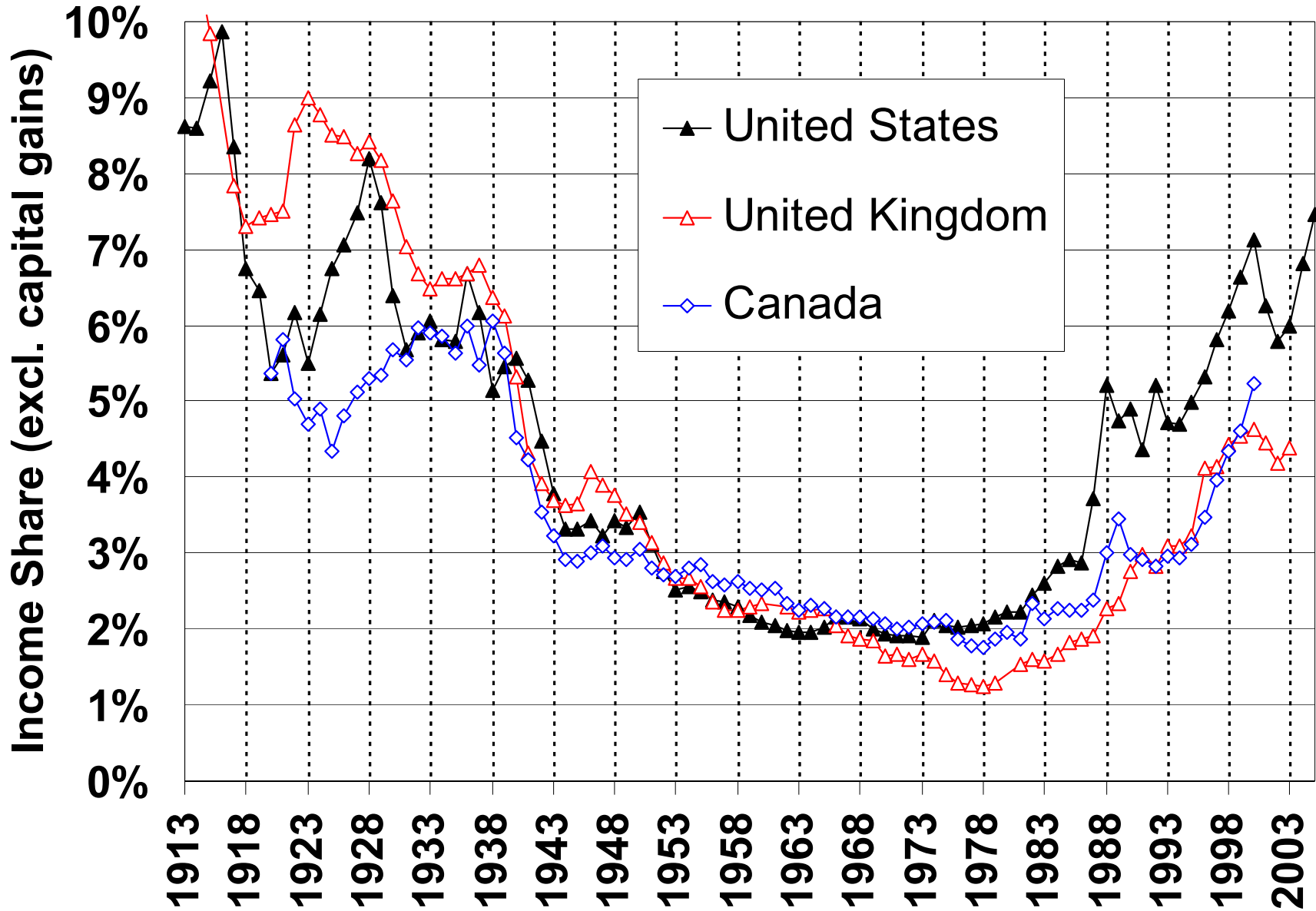
2) **Medium Run:** Based on historical record:

a) Top incomes recover quickly with the economy if no drastic changes in tax and regulation policies ('01 recession)

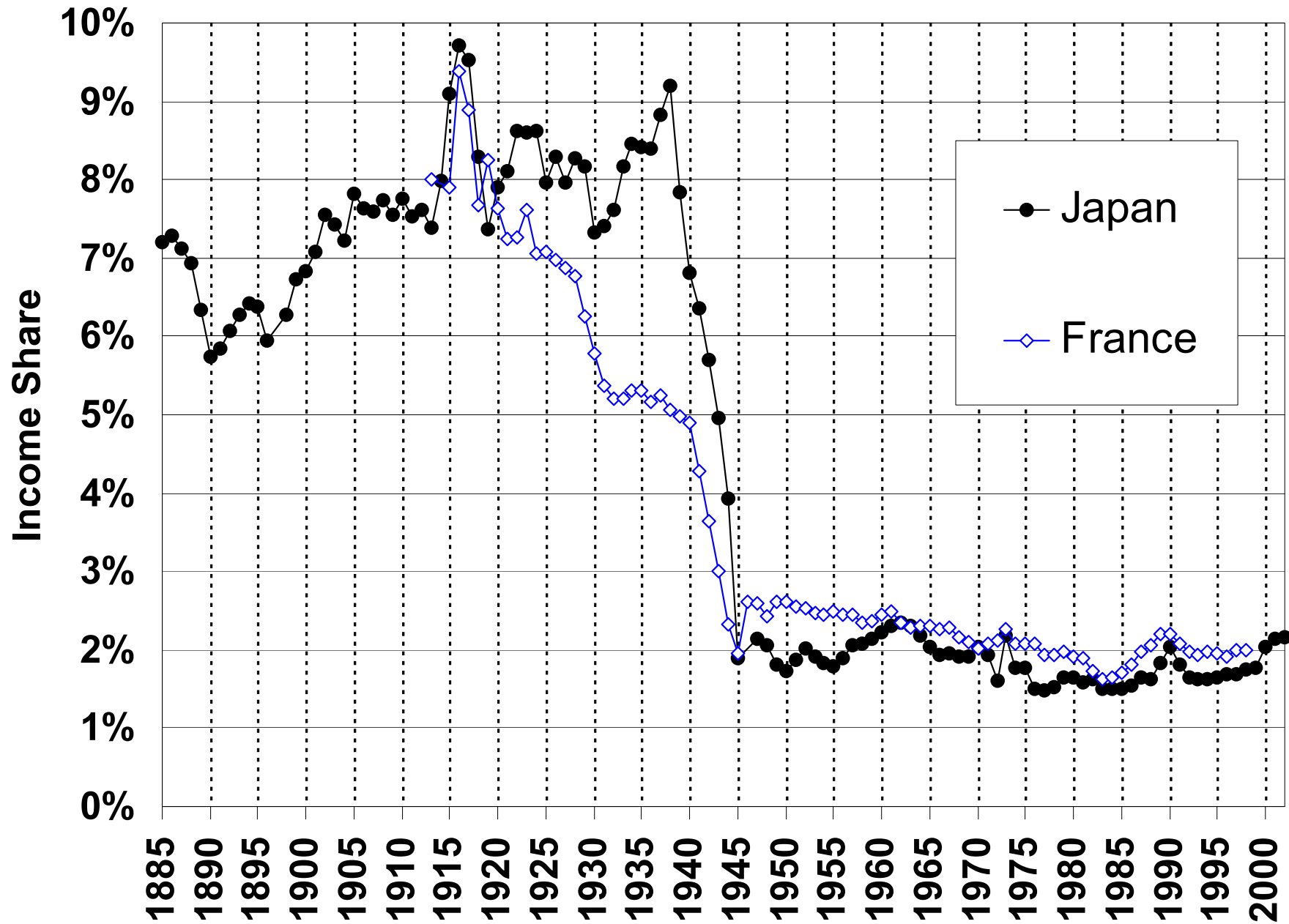
b) Top incomes do not recover after Great Depression possibly because of large tax and regulatory changes

US Today seems more in scenario a) than b)

# Top 0.1% income shares in English-Speaking Countries



# Top 0.1% income share in France and Japan



## **KEY RESULT 1: DROP IN TOP CAPITAL INCOMES**

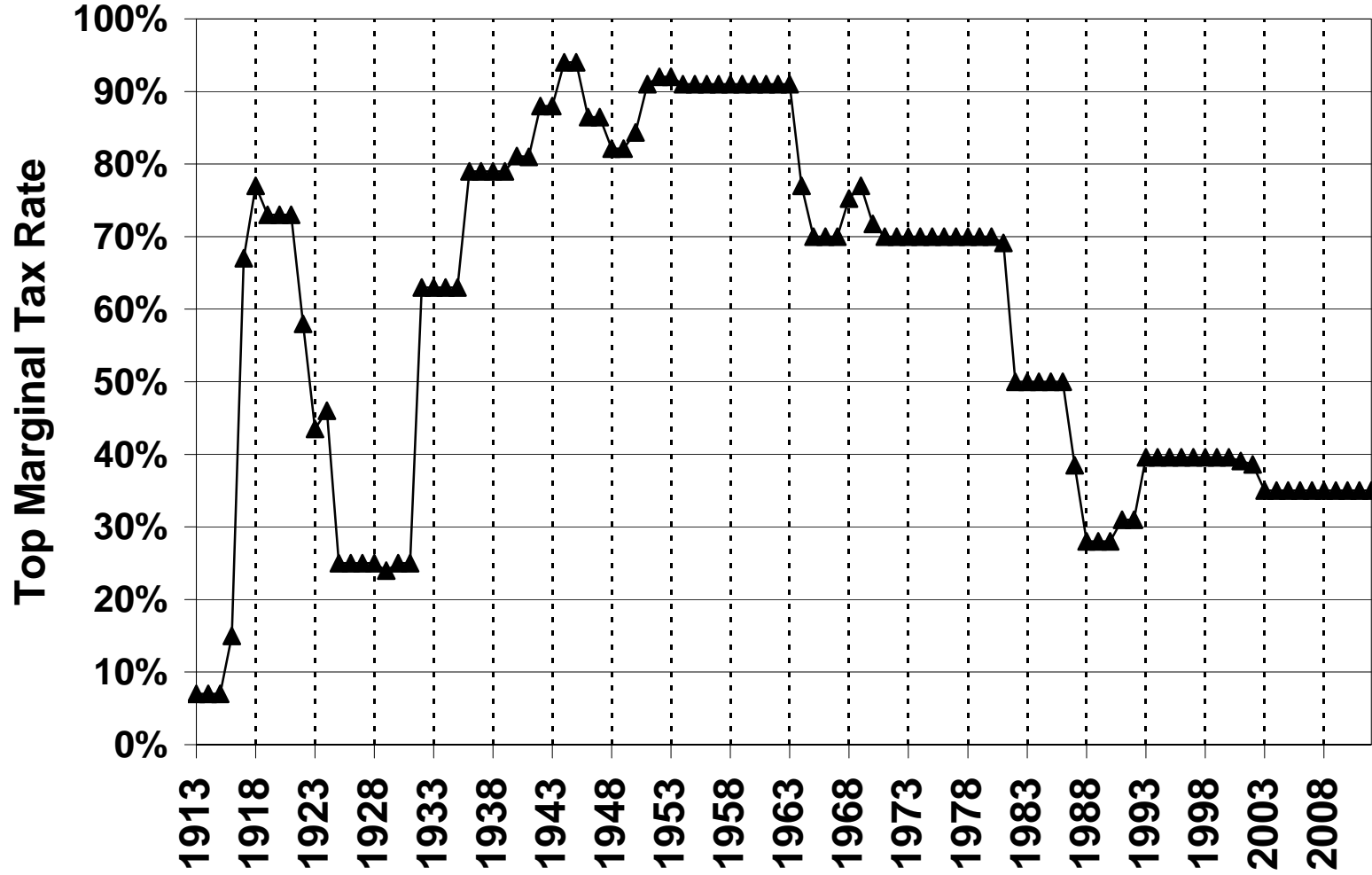
Most countries experience a dramatic reduction in income concentration during the first part of the 20th century with no recovery.

- 1) This is a capital income phenomenon (confirmed by estate tax statistics and wealth tax statistics)
- 2) War and depression shocks hit top capital earners (drop follows each country specific history)
- 3) This is NOT a Kuznets phenomenon driven by technological change
- 4) Why top capital earners do not recover after WWII?

## WHY TOP CAPITAL EARNERS DO NOT RECOVER AFTER WWII?

- 1) Top fortunes of the early 20th century were accumulated at a time of very modest income and wealth taxation
- 2) Development of progressive income and estate tax systems starts during Wars and Great Depression and continues after WWII
- 3) High top income and estate tax rates reduce after-tax returns for top capital earners ⇒ Harder to accumulate and transmit large fortunes
- 4) Development of pension systems and home-ownership democratizes wealth ownership

# US Top Marginal Federal Individual Tax Rate, 1913-2012



Source: Tax Policy Center  
Top marginal tax rate on ordinary income

## TAXES AND WEALTH ACCUMULATION

Pre-tax real annual return on wealth is  $r$  ( $\simeq 7\%$ )

With no taxes, if invest  $W$  at date 0, at date  $T$ , get  $W \cdot (1+r)^T$ :  
 $T = 40, r = .07 \Rightarrow (1+r)^T = 15$  Huge effects of compounding interest

If top rate is  $\tau$ , very large wealth holders will pay fraction  $\tau$  of their return in taxes:  $W = [1 + (1 - \tau)r]^T$ ,  $\tau = 0.6 \Rightarrow [1 + (1 - \tau)r]^T = 3 \Rightarrow$  Harder to maintain fortune

If low wealth holders face much lower tax rates  $\tau = 0.1$ , they can accumulate wealth more easily:  $[1 + (1 - 0.1)r]^T = 11.5$

Progressive taxes will equalize wealth holdings (and hence capital income) in the long-run

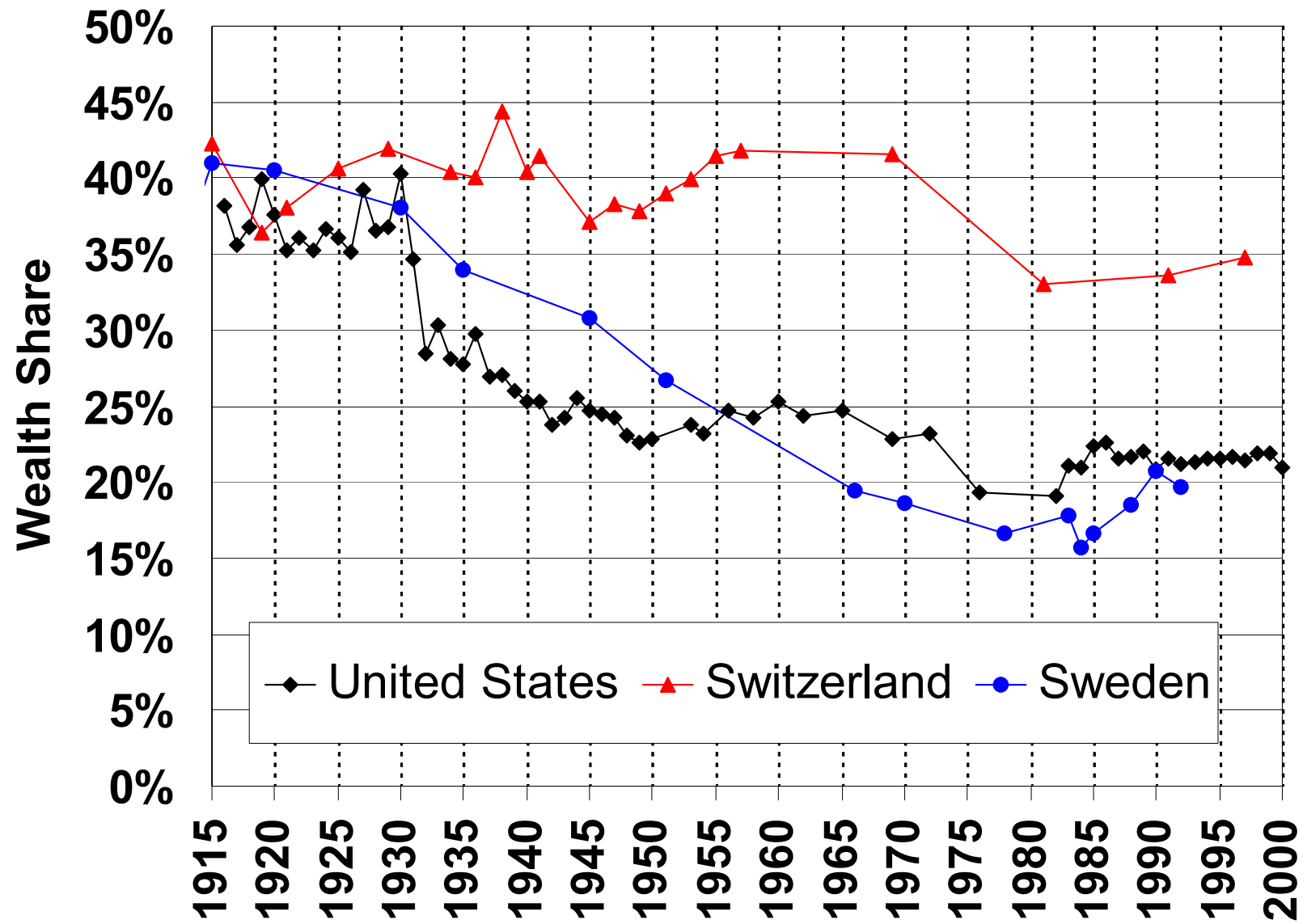


# TESTING ROLE OF SHOCKS AND PROGRESSIVE TAXATION

Divide countries into 4 groups based:

- 1) War / Depression Shock + Progressive Taxation (US, UK, Canada, France, Japan)
- 2) No War / Depression Shock + No Progressive Taxation (Switzerland)
- 3) No War / Depression Shock + Progressive Taxation (Sweden)
- 4) War / Depression Shock + no Progressive Taxation (No good OECD example)

# Top 1% wealth share in US, Switzerland, Sweden, 1915-2000



## TESTING ROLE OF PROGRESSIVE TAXATION

Unfortunately, no OECD example of a country with significant war/depression shock and NO progressive taxation

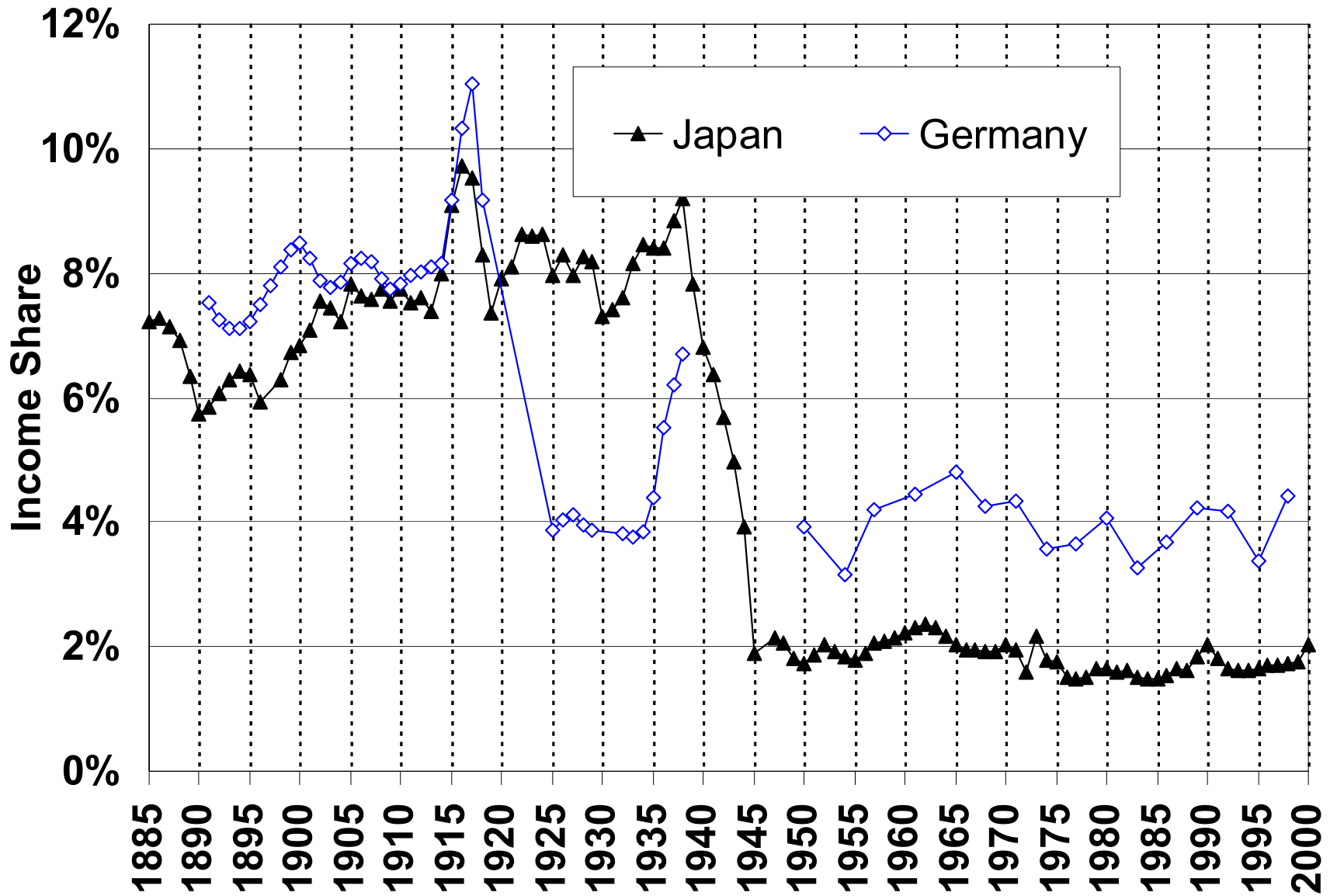
BUT comparison Japan and Germany is instructive:

Both countries experienced massive WWII shock

Japan developed very progressive post-war redistribution and taxation (MacArthur) (top income and estate tax rates of 70-80%)

West Germany adopted less progressive tax system (especially on estates)

# Top 0.1% income share in Germany and Japan



## KEY RESULT 2: RECENT SURGE IN TOP INCOMES IN ENGLISH SPEAKING COUNTRIES ONLY

- 1) Driven primarily by surge in top **labor** income (executive compensation) ⇒ Difference across countries rules out pure technical change explanation
- 2) Optimistic view: market for executives hindered by frictions (high top tax rates, Unions, etc.) which have disappeared in the US, UK, Canada but not Continental Europe and Japan
- 3) Pessimistic view: US executives have increased their ability to extract rents from the company they run no efficiency gains, maybe losses

## INEQUALITY AND GROWTH

- 1) 1945-1970 is a period of very high growth and low inequality (Japan miracle)  $\Rightarrow$  High top tax rates do not necessarily kill growth
- 2) 1980-present: Anglo-Saxon countries have experienced higher growth and more inequality than Continental Europe and Japan BUT large fraction of US growth has gone to the top
- 3) Database could be used to do a more systematic regression analysis of effects of inequality on growth (raises difficult identification issues)

## **US Evidence based on SSA data since 1937**

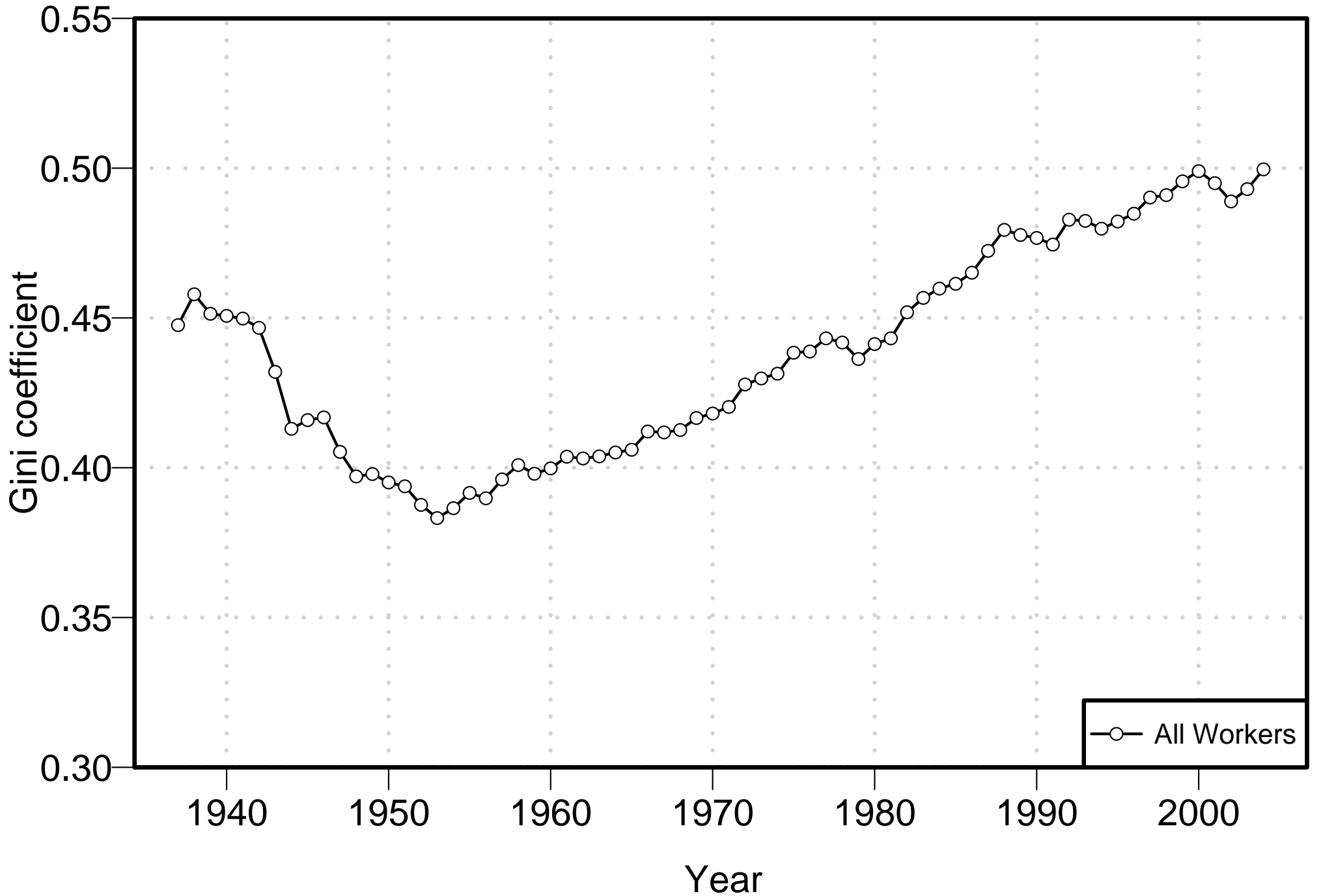
Social Security Administration (SSA) records earnings of workers since SSA started in 1937. Longest available source of *longitudinal earnings micro-data*

SSA data includes employment earnings: wages and salaries, bonuses, and stock-options BUT excludes self-employment income, business income, capital income

SSA data covers since 1937 private for-profit sector employees [excludes govt workers and non-profit organization workers (health+education)]

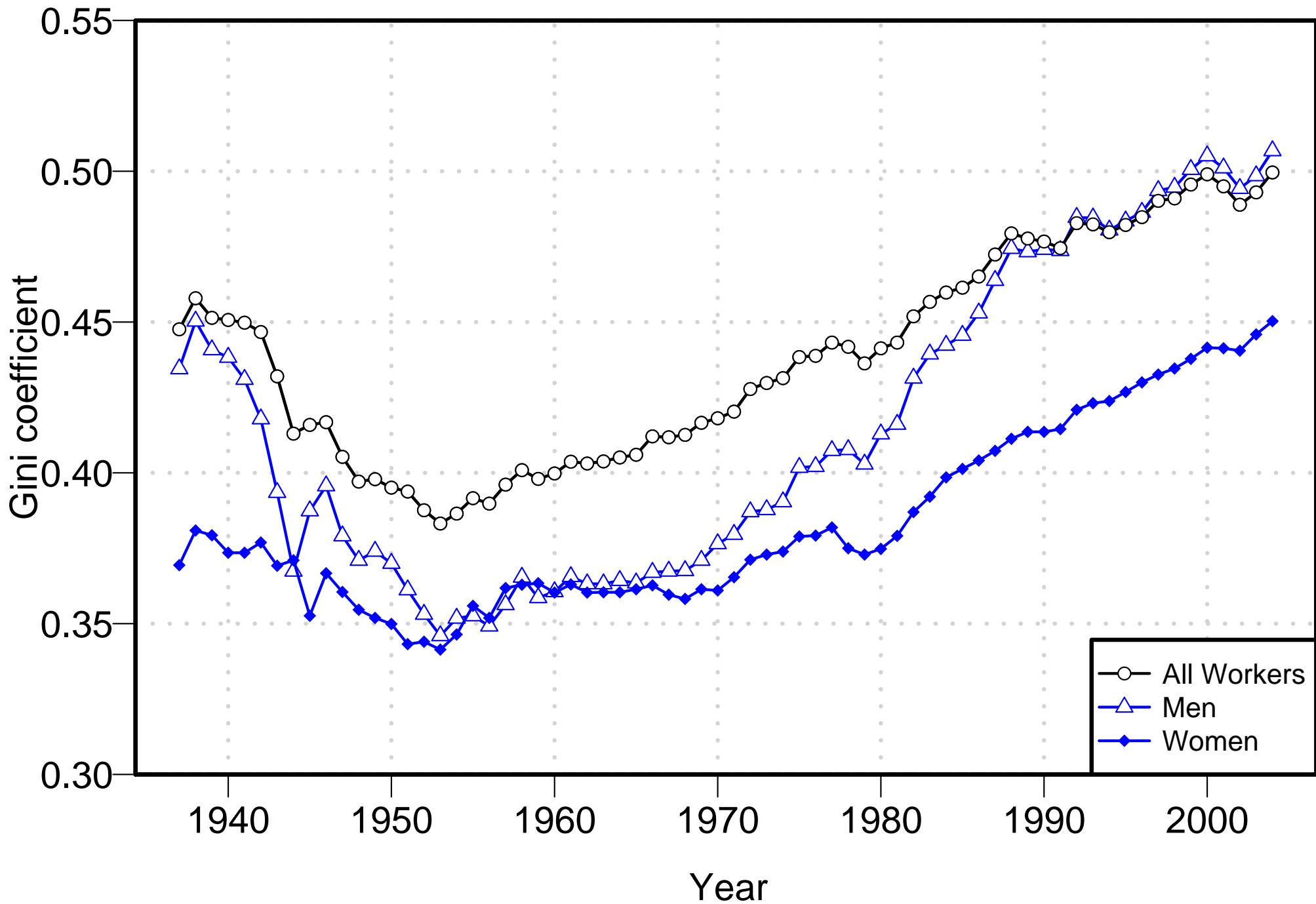
Information on earnings, gender, age, race

**Figure 1: Gini coefficient**

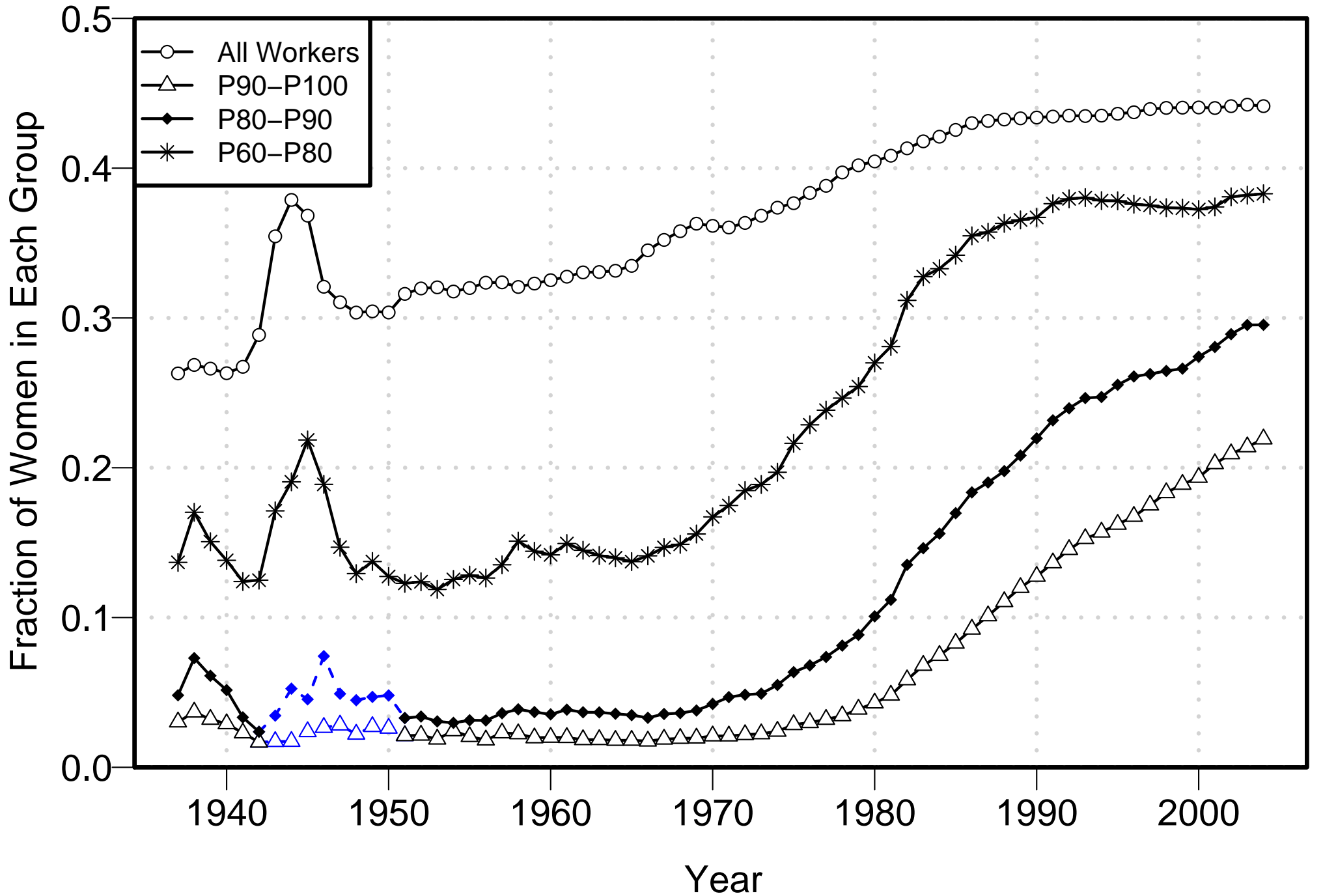




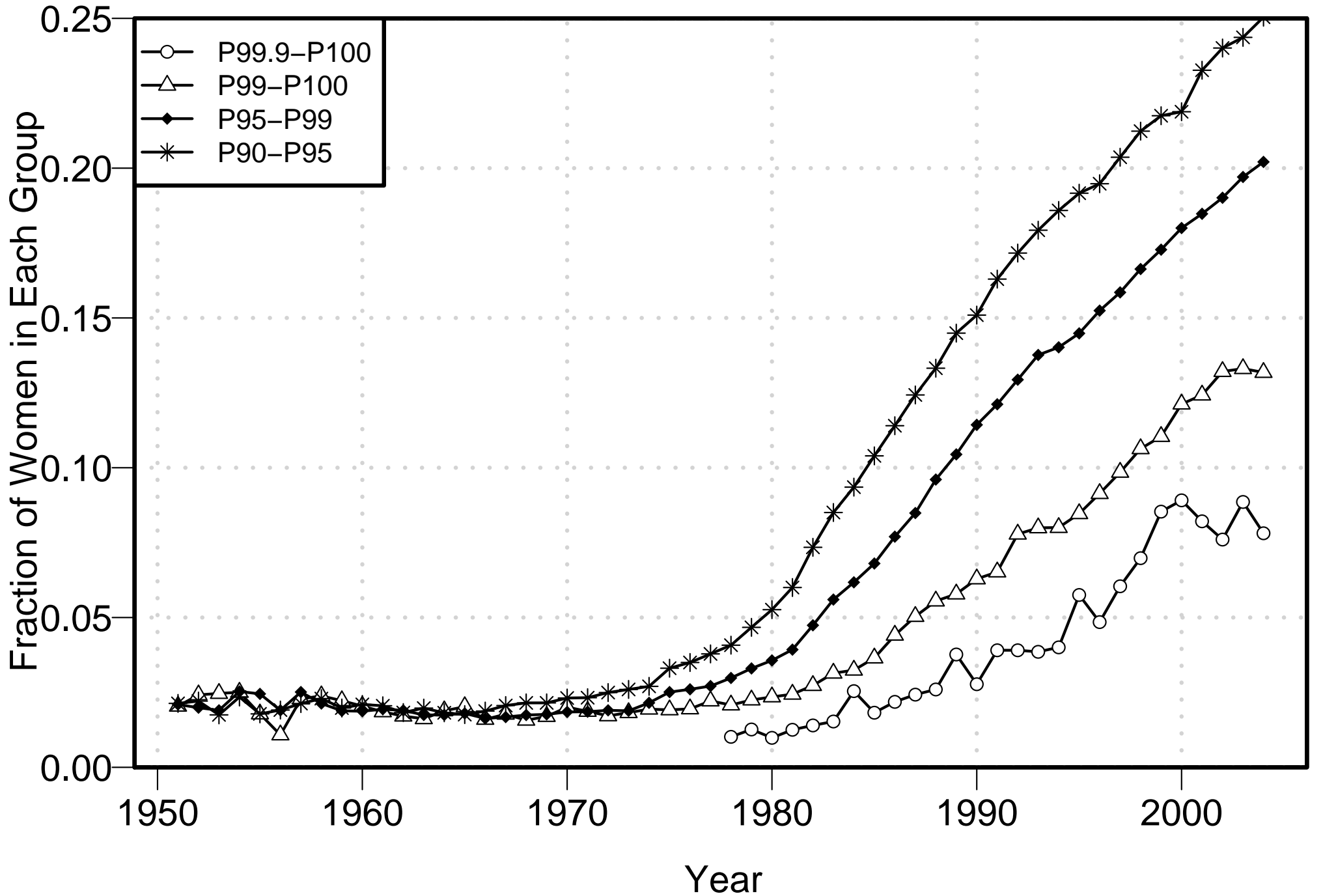
# Figure 1: Gini coefficient by gender



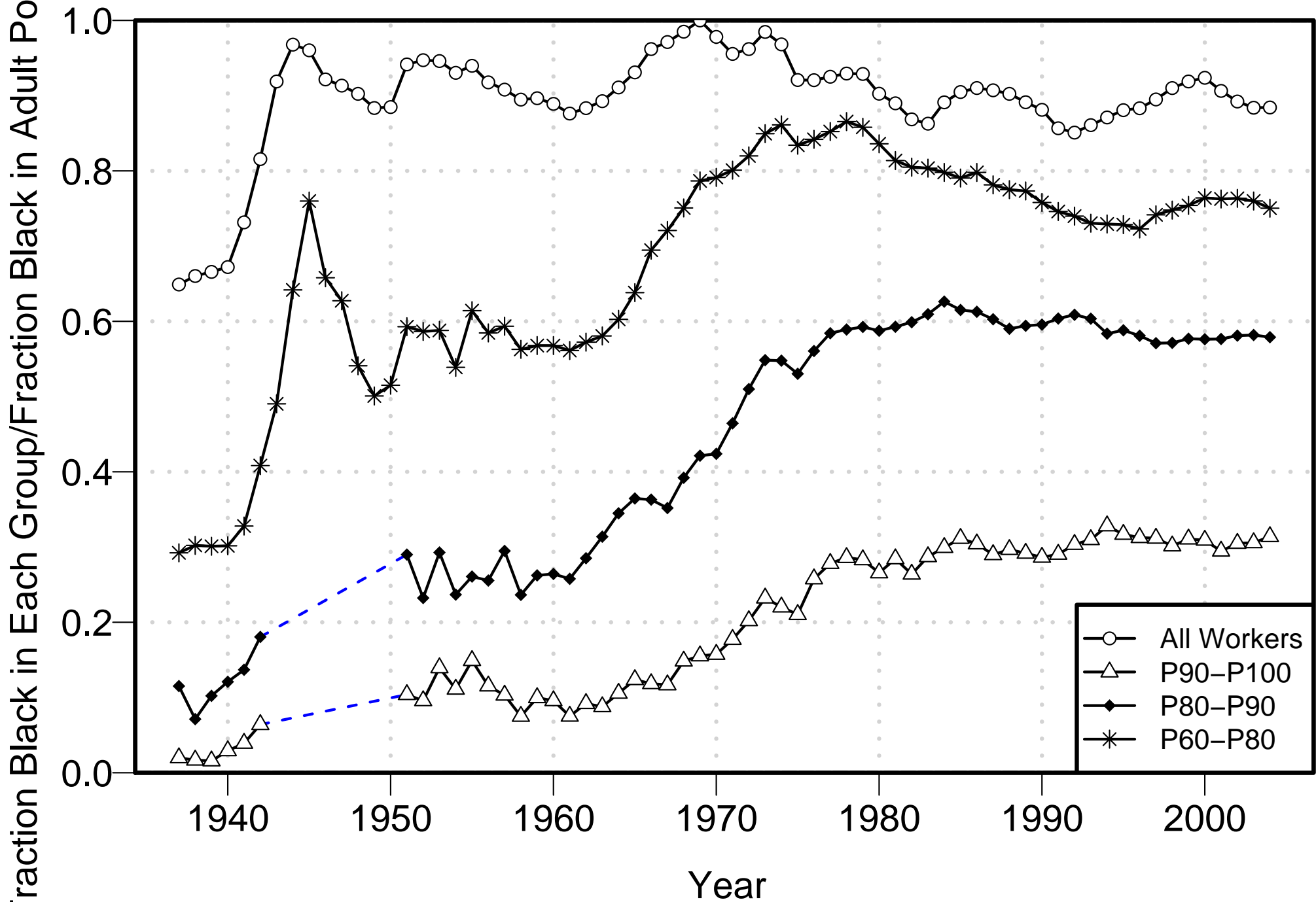
# Figure 8A: Gender Gap in Upper Groups



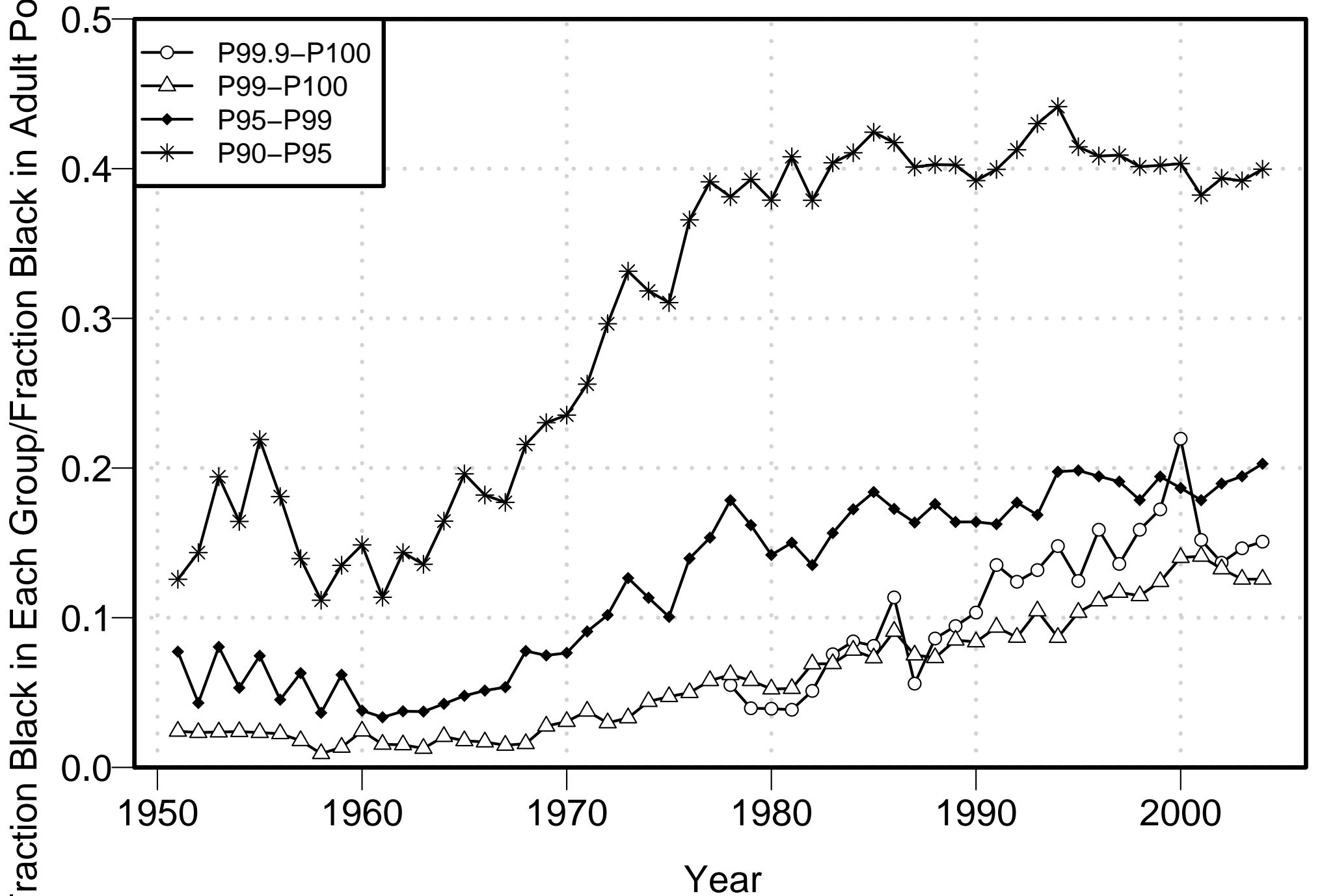
# Figure 8B: Gender Gap in Top Groups



### Figure 9A: Black-White Gap in Upper Groups



### Figure 9B: Black-White Gap in Top Groups



## Key Empirical Facts on Labor Income Inequality

- 1) In the US, labor income inequality decreased dramatically from 1939 to 1953 (Great Compression)
- 2) In the US, labor income inequality has increased substantially since 1970 and especially in the 1980s
- 3) Recent increase in labor income inequality due in large part (especially since 1990) to surge in **top** labor incomes (executive compensation)
- 4) Surge in top labor incomes did not happen in all countries: happened in English-Speaking countries but not in Japan or Continental Europe

## **Labor Economics Debate on Causes of US Inequality Increase**

- 1) Skilled Biased Technological Change: Recent technological progress (such as IT revolution) favors highly skilled workers and hence increases highly skilled wages and inequality [New Kuznets' cycle]
- 2) Changes in Institutions regulating the labor market: Decline in Union membership since 1980, Decline in Minimum Wage

# TAXATION AND REDISTRIBUTION

**Key question:** Do/should government reduce inequality using taxes and transfers?

1) Governments use **taxes** to raise revenue

2) This revenue funds **transfer** programs:

a) Public Education, Retirement Benefits, Health Care Benefits

b) Means-tested Transfers (Earned Income Credit, Food Stamps, Welfare, etc. in the US)



## Govt Redistribution with Taxes and Transfer

Govt taxes individuals based on income and consumption and provides transfers:  $z$  is pre-tax income,  $y = z - T(z) + B(z)$  is post-tax income

- 1) If inequality in  $y$  is less than inequality in  $z \Leftrightarrow$  tax and transfer system is redistributive (or progressive)
- 2) If inequality in  $y$  is more than inequality in  $z \Leftrightarrow$  tax and transfer system is regressive

## Govt Redistribution with Taxes and Transfer: Examples

- If  $y = z \cdot (1 - t)$  with constant  $t$ , tax/transfer system is neutral
- If  $y = z \cdot (1 - t) + G$  where  $G$  is a universal (lumpsum) allowance, then tax/transfer system is progressive
- If  $y = z - T$  where  $T$  is a uniform tax (poll tax), then tax/transfer system is regressive

## Federal US Tax System: Overview

- 1) Individual income tax (on both labor+capital income) [progressive](40% of fed tax revenue)
- 2) Payroll taxes (on labor income) financing social security programs [about neutral] (40% of revenue)
- 3) Corporate income tax (on capital income) [progressive if incidence on capital income] (15% of revenue)
- 4) Estate taxes (on capital income) [very progressive] (2% of revenue)
- 5) Minor excise taxes (mostly labor income) [regressive] (3% of revenue)

# US Tax System: Progressivity and Evolution

## Medium Term Changes:

- 1) Federal Tax Progressivity has declined since 1970 but govt progressivity remains substantial especially when including transfers (Medicaid, Social Security, UI, DI, various income support programs)
- 2) Increase of refundable tax credits and decrease of traditional welfare to redistribute to low and middle income families

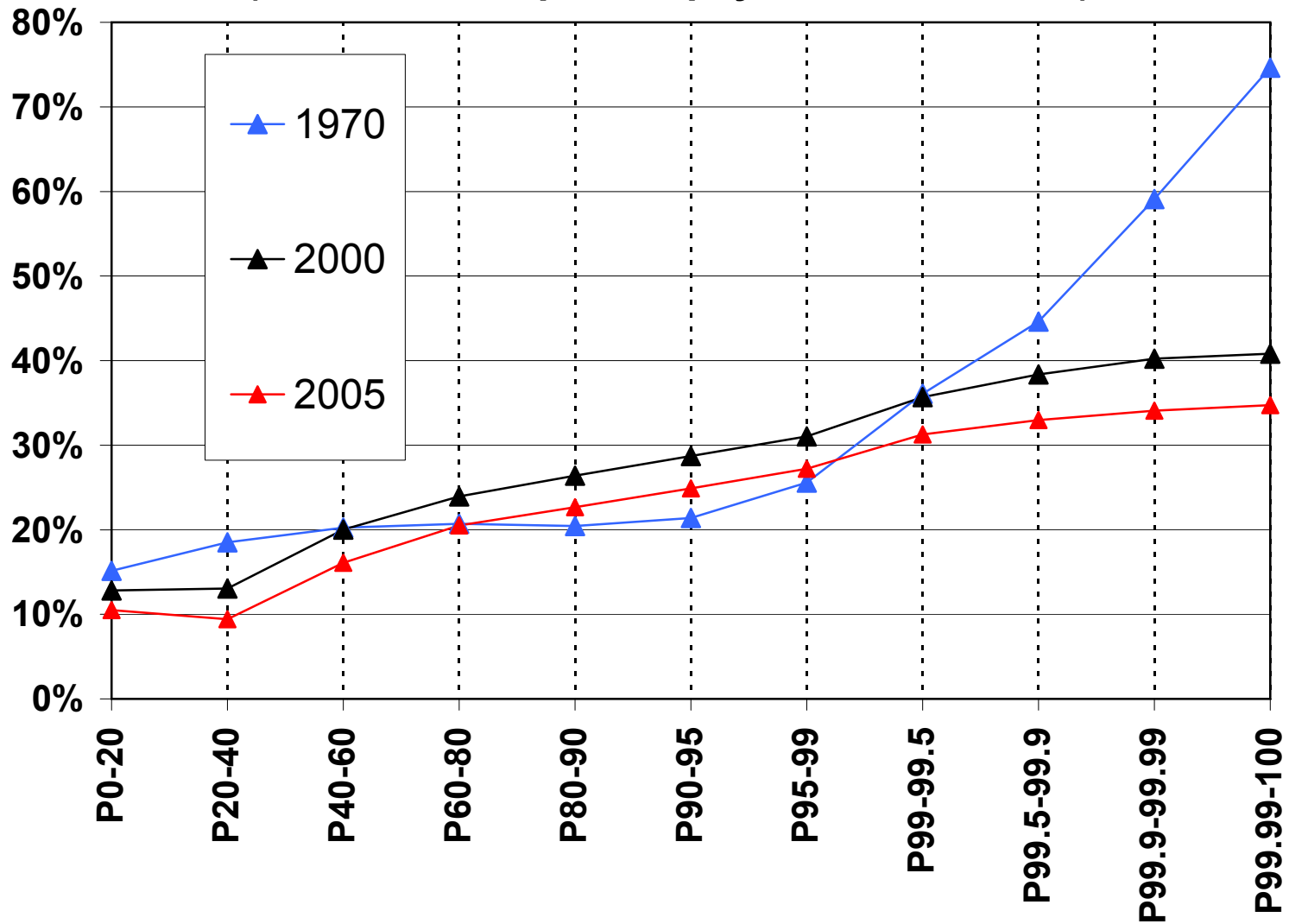
**Long Term Changes:** Before 1913, US taxes were primarily tariffs, excises, and real estate property taxes [slightly regressive], no transfer programs (and hence small govt)

## 4. Why has US Government Grown so Much?

- **Demand Side Argument: Wagner law** Govt provided goods (education, health, social insurance) are luxury goods
- **Supply Side Argument: Tax Enforcement Ability** Ability of govt to tax increases dramatically over the course of economic development [easy to tax large companies which need careful records for their operations]

⇒ Inability of developing countries to fund public goods (infrastructure, education, health care, retirement) because of limited tax capacity is an important development bottle-neck

## 2. Federal Average Tax Rates by Income Groups (individual+corporate+payroll+estate taxes)



## Summary of Progressive Income Tax Changes

- 1) US Federal Tax System is still clearly progressive
- 2) US Tax Progressivity has declined sharply at the top of the distribution due to large reductions in top income tax rates, corporate tax, and estate tax
- 3) US Tax Progressivity has increased slightly at the bottom due to development of refundable tax credits (compensated for reduced traditional welfare transfers)
- 4) US tax was more progressive than France, reverse is true today

## Equity-Efficiency Trade-off

Taxes can be used to raise revenue for transfer programs which can reduce inequality in disposable  $\Rightarrow$  Desirable if society feels that inequality is too large

Taxes (and transfers) reduce incentives to work  $\Rightarrow$  High tax rates create economic inefficiency if individual respond to taxes

Size of behavioral response measured by elasticity  $e$  defined as  $e = [(1 - \tau)/Z]dZ/d(1 - \tau)$ : percent change in income when  $1 - \tau$  increases by 1 percent.

$\Rightarrow$  Generates an equity-efficiency trade-off



## Laffer Curve

With a constant tax rate  $\tau$ , total reported income  $Z$  depends on  $1 - \tau$  (net-of-tax rate)

Tax Revenue  $R(\tau) = \tau \cdot Z(1 - \tau)$  is inversely U-shaped with  $\tau$ :  $R(\tau = 0) = 0$  (no taxes) and  $R(\tau = 1) = 0$  (nobody works): called the Laffer Curve

Top of the Laffer Curve corresponds to tax rate  $\tau^*$  maximizing tax revenue: inefficient to have  $\tau > \tau^*$

$$0 = R'(\tau^*) = Z - \tau^* dZ/d(1 - \tau) \Rightarrow$$

$\tau^* = 1/(1 + e)$  where  $e = [(1 - \tau)/Z]dZ/d(1 - \tau)$  is the elasticity of reported income with respect to the net-of-tax rate

## Actual Income Tax Schedules

Actual Income Tax Schedules  $T(z)$  are piece-wise linear and continuous with marginal tax rates increasing from bracket to bracket

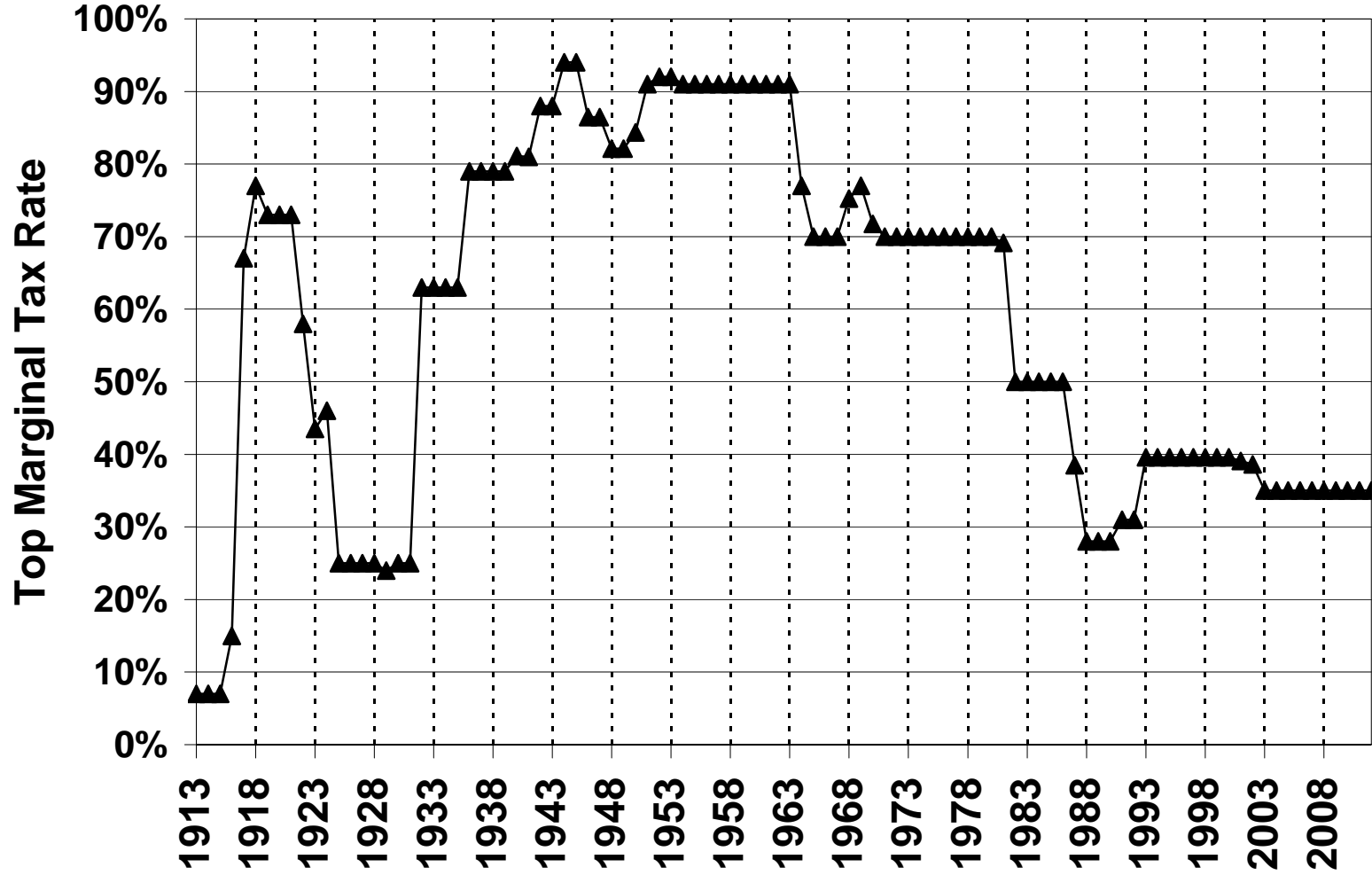
Currently in the US:  $T'(z) = 0$  for low incomes (below exemption level), and various brackets with top rate  $T'(z) = 35\%$  for  $z$  above \$400,000 (top bracket threshold).

Substantial changes in tax rates overtime due to large tax reforms  $\Rightarrow$  Economists use tax reforms to estimate the elasticity of reported income with respect to marginal tax rates

## Evolution of US Top Marginal Tax Rates

- 1) Top marginal tax rates were continuously very high from 1932 to 1981 but top bracket threshold was also very high  $\Rightarrow$  Only super rich (top .01% or less) were hit by top rates
- 2) Top marginal tax rates have declined substantially in the 1980s from 70% to around 30% and have stayed between 30 and 40% since then  $\Rightarrow$
- 3) Current debate on top rates 35% (Bush) vs. 39.6% (Clinton, Obama?) seems trivial relative to past changes
- 4) Most rich countries have experienced similar changes (but less extreme than US)

# US Top Marginal Federal Individual Tax Rate, 1913-2012



Source: Tax Policy Center  
Top marginal tax rate on ordinary income

## TOP INCOMES AND TAXES

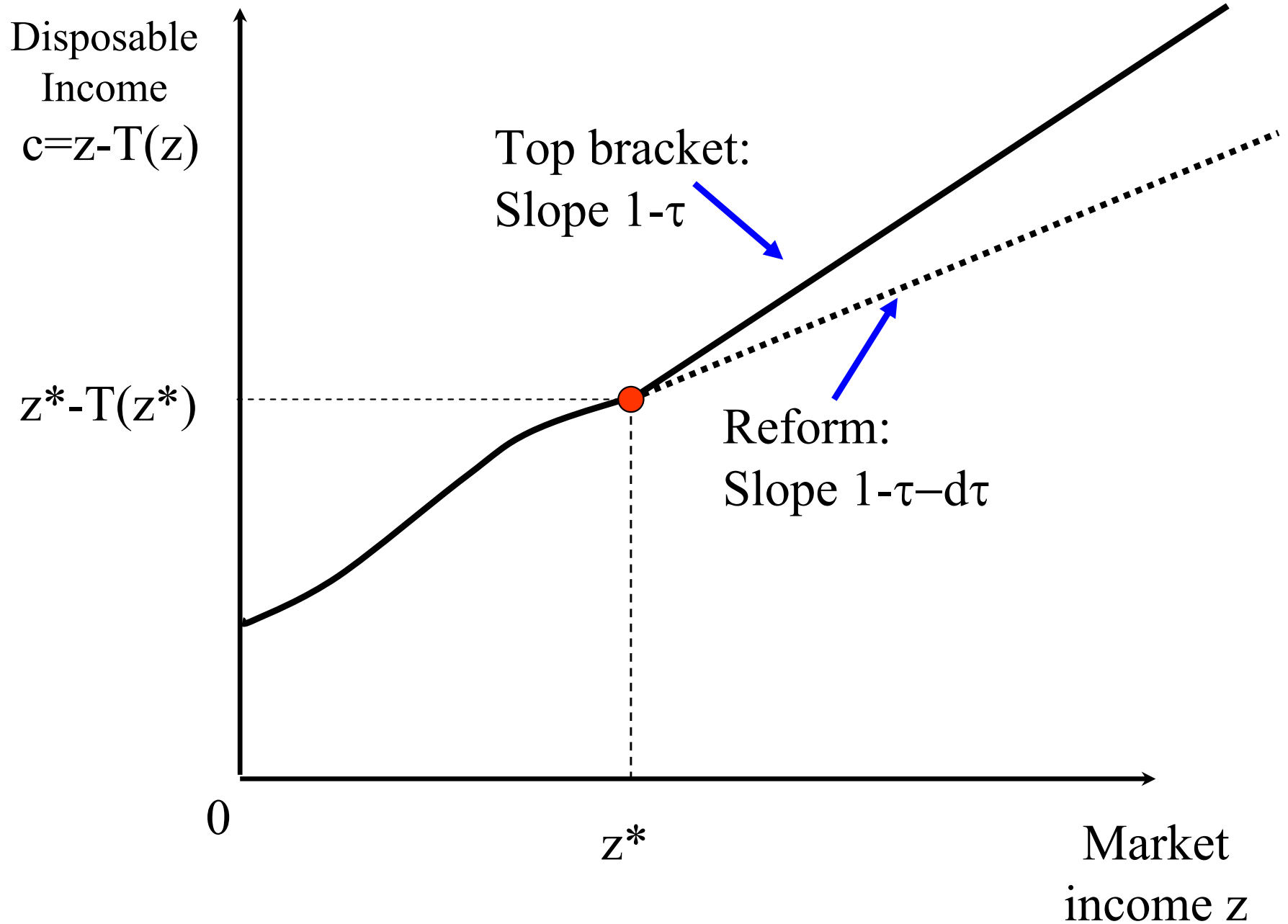
**Pre-tax** top US incomes have surged in recent decades: top 1% income share increased from 9% in 1970 to 23.5% in 2007

In 2007, top 1% income earners paid average Fed individual tax rate of “only” 22%

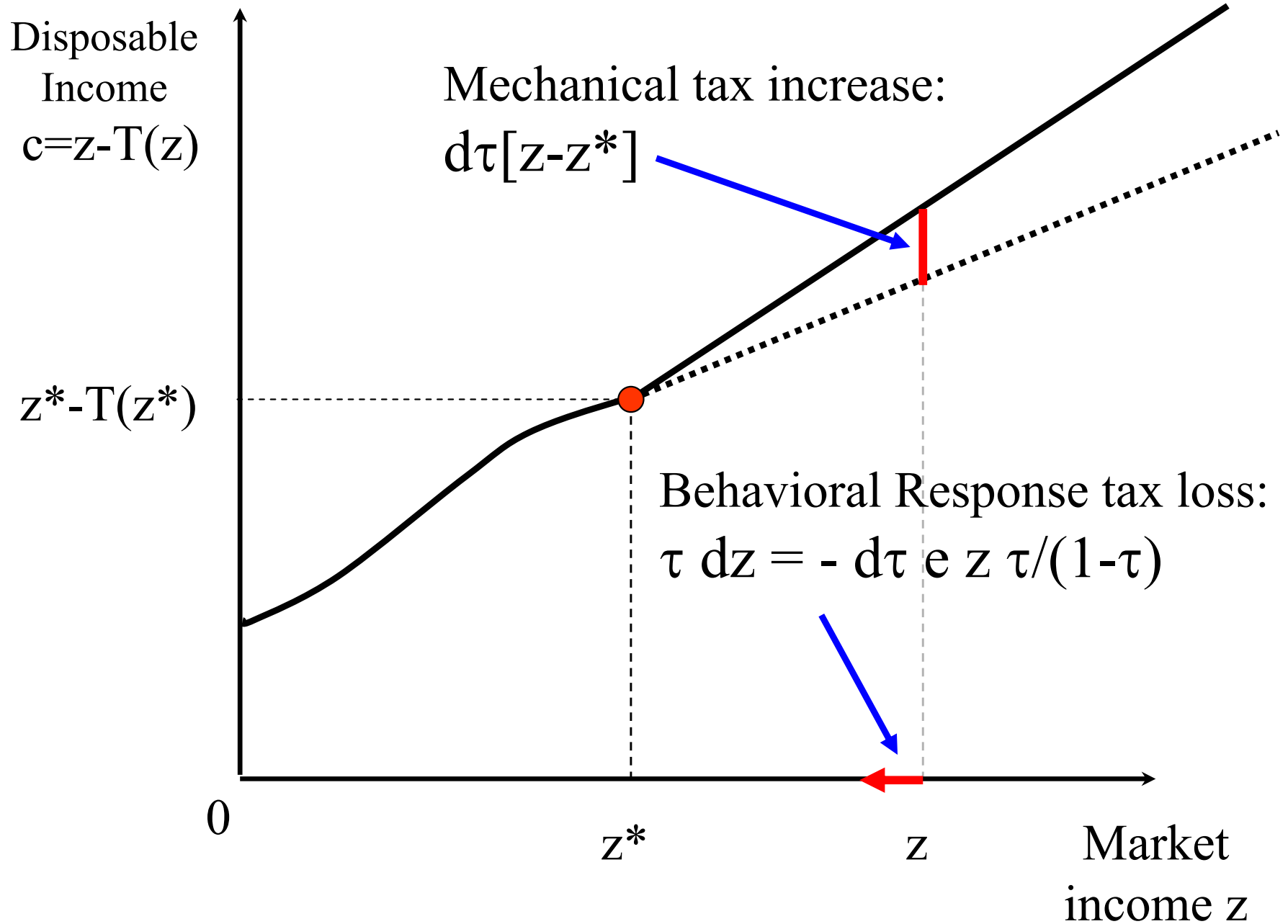
Absent behavioral responses, increasing fed indiv tax rate on top 1% from 22% to 43% would raise revenue by 3 pts of GDP [\$450bn/year]

⇒ Top 1% has large potential tax capacity but higher taxes on top 1% might discourage economic activity / encourage tax avoidance: **Equity-Efficiency trade-off**

# Optimal Top Income Tax Rate (Mirrlees '71 model)



# Optimal Top Income Tax Rate (Mirrlees '71 model)



## OPTIMAL TOP INCOME TAX RATE

Revenue maximizing top **marginal tax rate** (above  $z^*$ ):

$$\tau^* = \frac{1}{1 + a \cdot e}$$

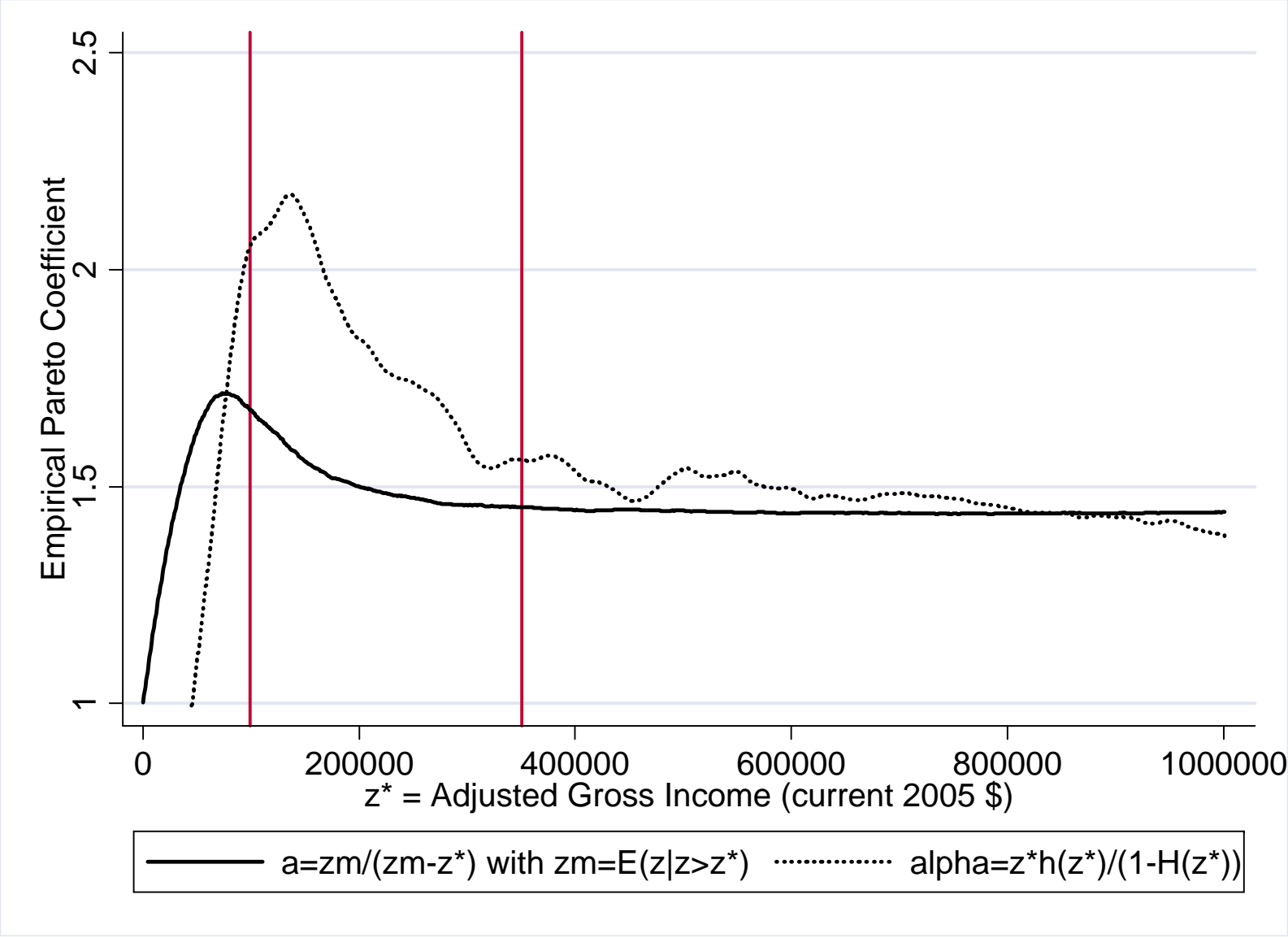
where  $e$  is the **elasticity** of top incomes with respect to  $1 - \tau$

and  $a = z_m / (z_m - z^*)$  is **Pareto** parameter with  $z_m =$  average income above  $z^*$

$a$  very stable with  $z^*$  (around 1.5 today in the US)

Mirrlees '71 model: If social marginal utility of the rich converges to zero  $\Rightarrow$  optimal asymptotic tax rate is  $\tau^* = 1/(1+a \cdot e)$





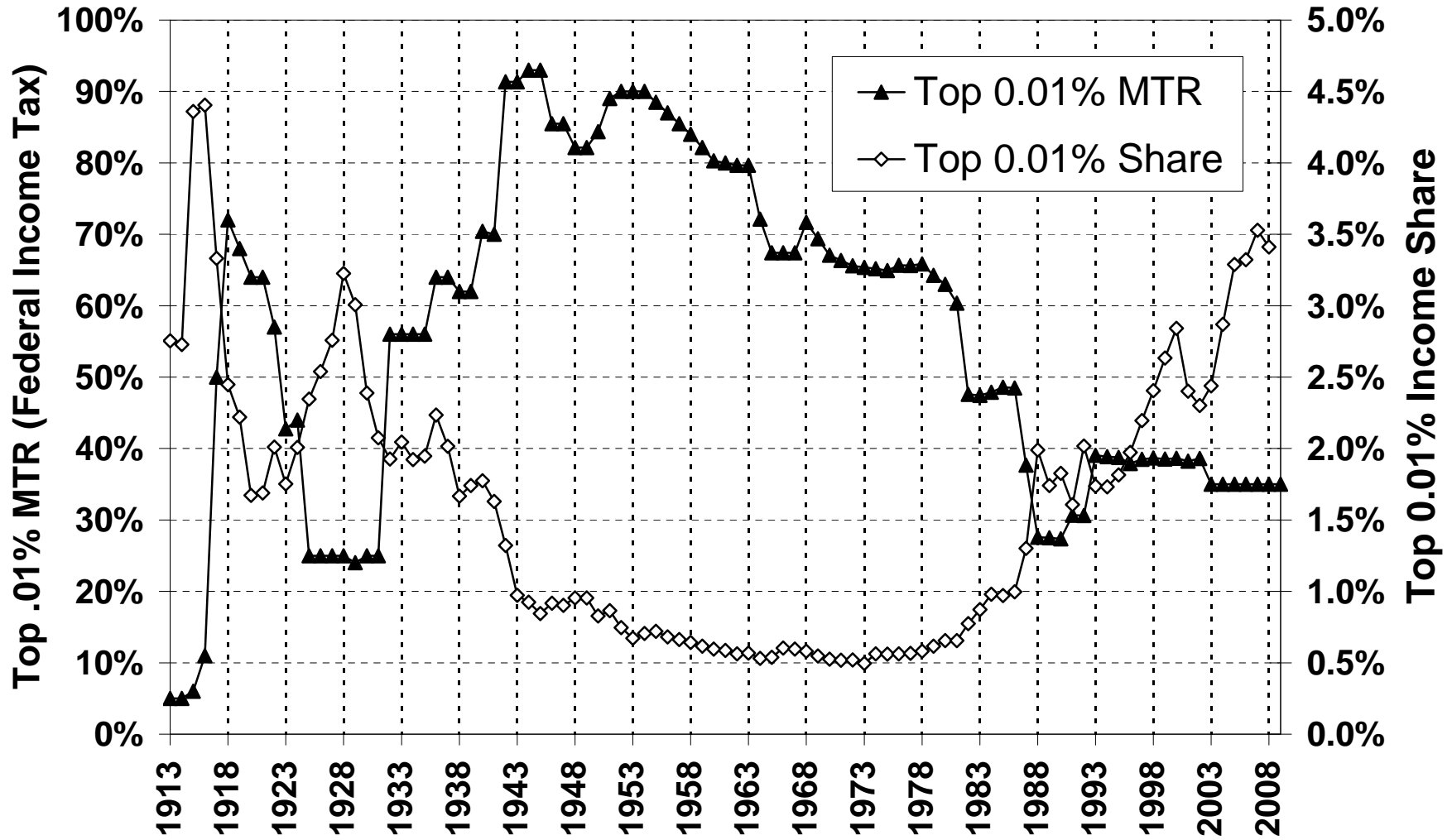
## WHAT IS THE ELASTICITY FOR TOP EARNERS?

Large empirical literature estimating  $e$  using tax reforms and micro tax return data

Three main conclusions (Saez-Slemrod-Giertz JEL'11):

- 1)  $e$  can be large but large compelling responses are due to **tax avoidance** (income shifting, income re-timing)
- 2) No direct evidence that **real** responses are large (at least in short-medium run)
- 3) Great uncertainty about long-run real responses to tax rate changes

## Top 0.01% US Income Share and Marginal Tax Rate



$$\log(\text{share}) = a + 0.617 (0.077) * \log(1 - \text{MTR}) + e$$

$$\log(\text{share}) = a + b * t + 0.666 (0.071) * \log(1 - \text{MTR}) + e$$

## REAL VS. AVOIDANCE RESPONSES CRITICAL

Fraction  $s$  of response  $dz$  to  $d\tau$  due to avoidance (fraction  $1 - s$  is real) and “shifted income”  $s \cdot dz$  is taxed at rate  $t \leq \tau$

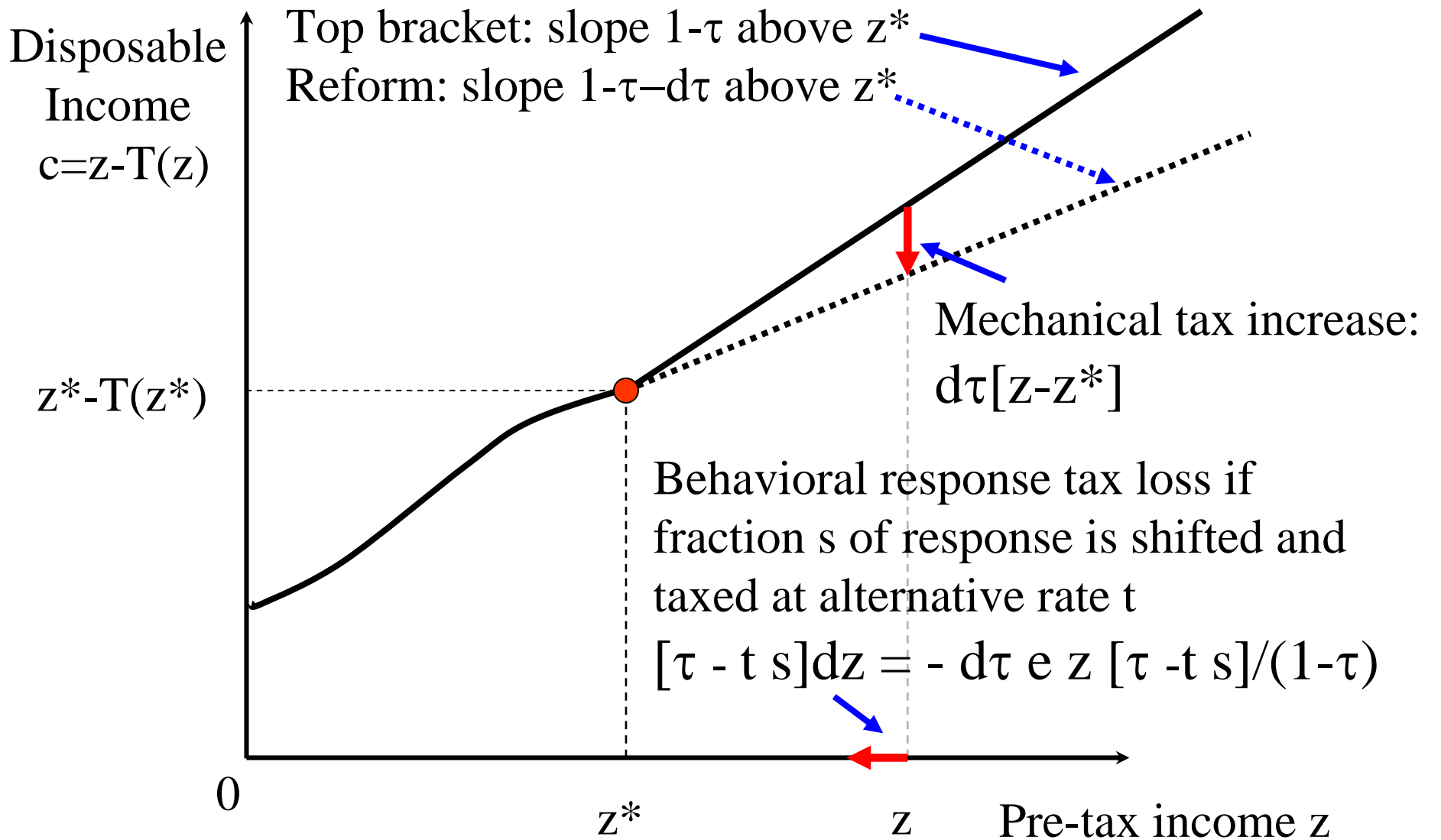
⇒ Tax revenue maximizing rate is (Saez, Slemrod, Giertz '11)

$$\tau = \frac{1 + a \cdot t \cdot s \cdot e}{1 + a \cdot e}$$

1) If  $t = 0$  then  $\tau = 1/(1 + a \cdot e)$  (avoidance vs. real irrelevant)

2) If  $t > 0$  then  $\tau > 1/(1 + a \cdot e)$  because of “fiscal externality”

3) **Fully optimal policy:**  $t = \tau$  and  $\tau = 1/[1 + a \cdot (1 - s)e]$  with  $(1 - s)e$  real elasticity (avoidance response  $s \cdot e$  irrelevant)



## LESSONS FROM TAX AVOIDANCE

1) Broaden the base to eliminate avoidance / evasion opportunities and reduce the elasticity

2) Increase top tax rates

**Key policy question:** Is it possible to eliminate avoidance elasticity using base broadening and enforcement? or would new avoidance schemes keep popping up?

a) Most tax avoidance schemes are the consequences of poorly designed tax system

b) Tax evasion off-shore can only be eliminated with international cooperation

## COMPENSATION BARGAINING EFFECTS

In models with frictions or imperfect information, pay  $z$  does not always equal marginal product  $y \Rightarrow$  scope for bargaining

Bargaining requires effort  $\Rightarrow$  likely affected by net-of-tax rate and creates a classical externality

Suppose fraction  $s$  of the response  $dz$  to  $d\tau$  is due to bargaining (and fraction  $1 - s$  is real so that  $dy = (1 - s)dz$ )

Suppose bargaining gains come at the expense of everybody (lumpsum)

Tax revenue maximizing rate (Piketty, Saez, Stantcheva '11):

$$\tau = \frac{1 + a \cdot s \cdot e}{1 + a \cdot e}$$

## COMPENSATION BARGAINING EFFECTS

Tax revenue maximizing rate (Piketty, Saez, Stantcheva '11):

$$\tau = \frac{1 + a \cdot s \cdot e}{1 + a \cdot e}$$

$s$  depends both on bargaining responses and whether top earners are overpaid

**1) Trickle-up** If top earners overpaid  $y < z$ , then  $s > 0$  and  $\tau > 1/(1 + a \cdot e)$

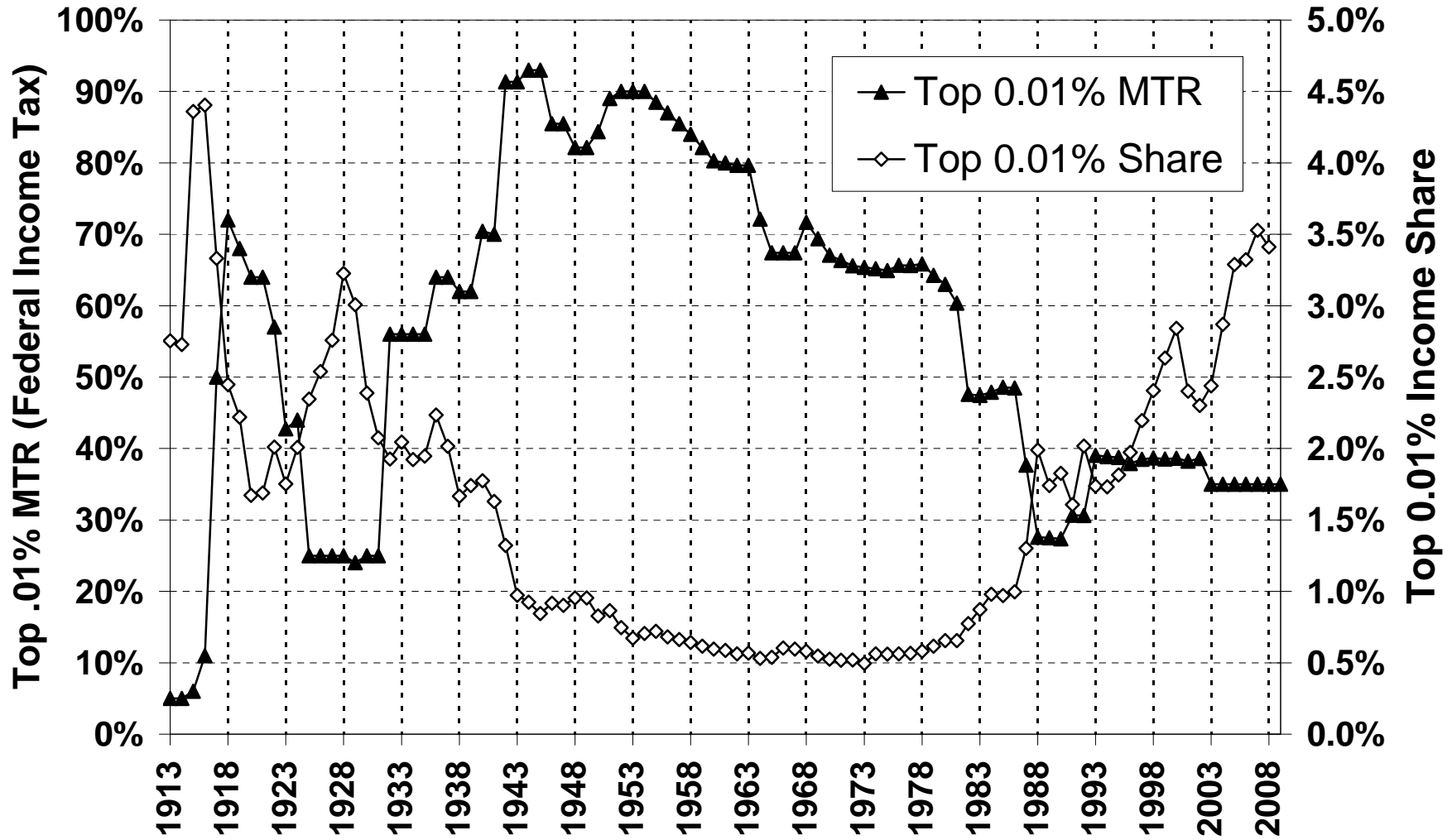
**2) Trickle-down** If top earners underpaid, then  $s < 0$  is possible and  $\tau < 1/(1 + a \cdot e)$



## 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
- ⇒ Total elasticity is large but could be a mix of real effects, avoidance effects, or bargaining effects

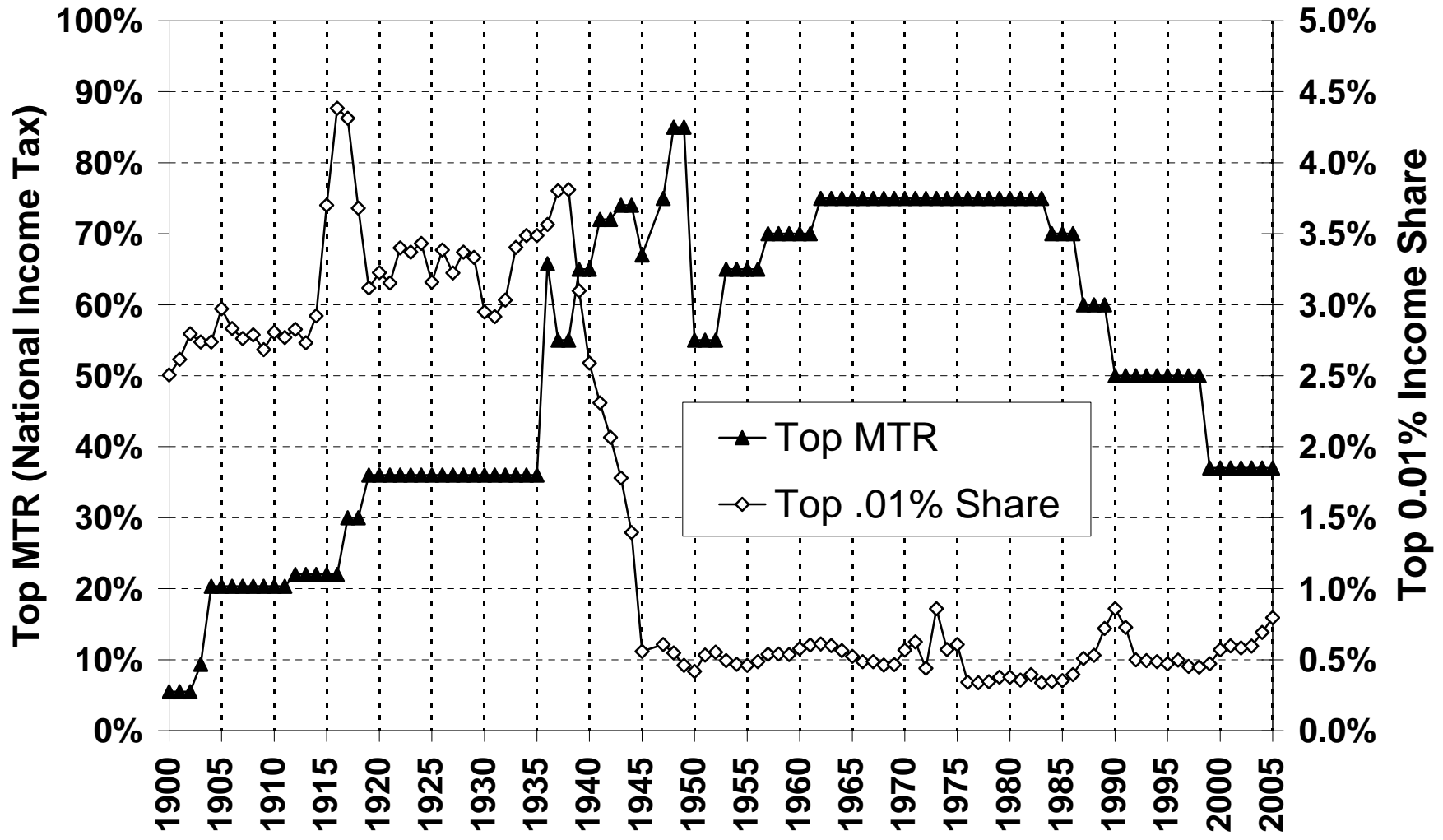
## Top 0.01% US Income Share and Marginal Tax Rate



$$\log(\text{share}) = a + 0.617 (0.077) * \log(1 - \text{MTR}) + e$$

$$\log(\text{share}) = a + b * t + 0.666 (0.071) * \log(1 - \text{MTR}) + e$$

## JAPAN: Top 0.01% Income Share and Top Marginal Tax Rate



$$\log(\text{share}) = a + 0.617 (0.077) * \log(1 - \text{MTR}) + e$$

$$\log(\text{share}) = a + b * t + 0.666 (0.071) * \log(1 - \text{MTR}) + e$$

## TOP RATES AND TOP INCOMES EVIDENCE

1) Use pre-tax top 1% income share data from 18 OECD countries in 1975 and 2005 from the **World Top Incomes Database**

2) Compute top (statutory) individual income tax rates using OECD data [including both central and local income taxes]. Those tax rates do not include payroll taxes, corporate taxes, or VAT and Sales taxes

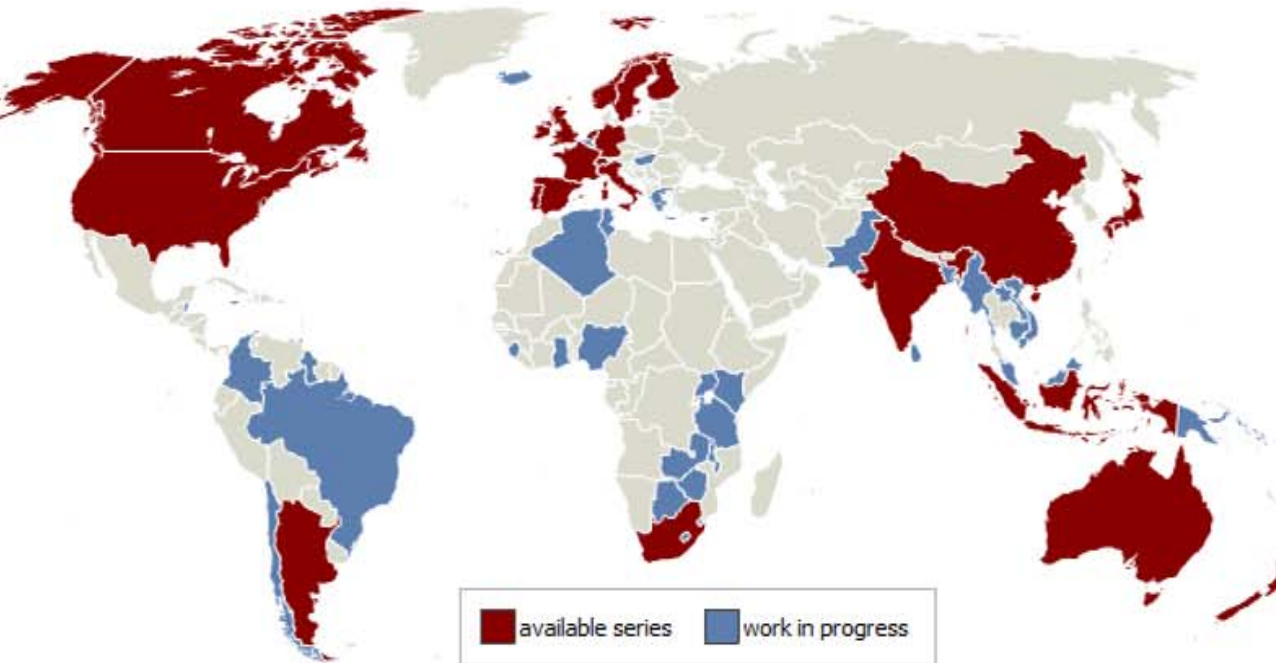
Plot top 1% pre-tax income share against top MTR in 1975, in 2005, and 1975 vs. 2005

OLS basic regressions:

$$\log(\text{Top 1\% Share}) = \alpha + e \cdot \log(1 - MTR) + \varepsilon$$

$$\Delta \log(\text{Top 1\% Share}) = \alpha + e \cdot \Delta \log(1 - MTR) + \varepsilon$$

# THE TOP INCOMES DATABASE



- Home
- Introduction
- The Database
- Graphics
- Country Information
- Work in Progress
- Acknowledgments



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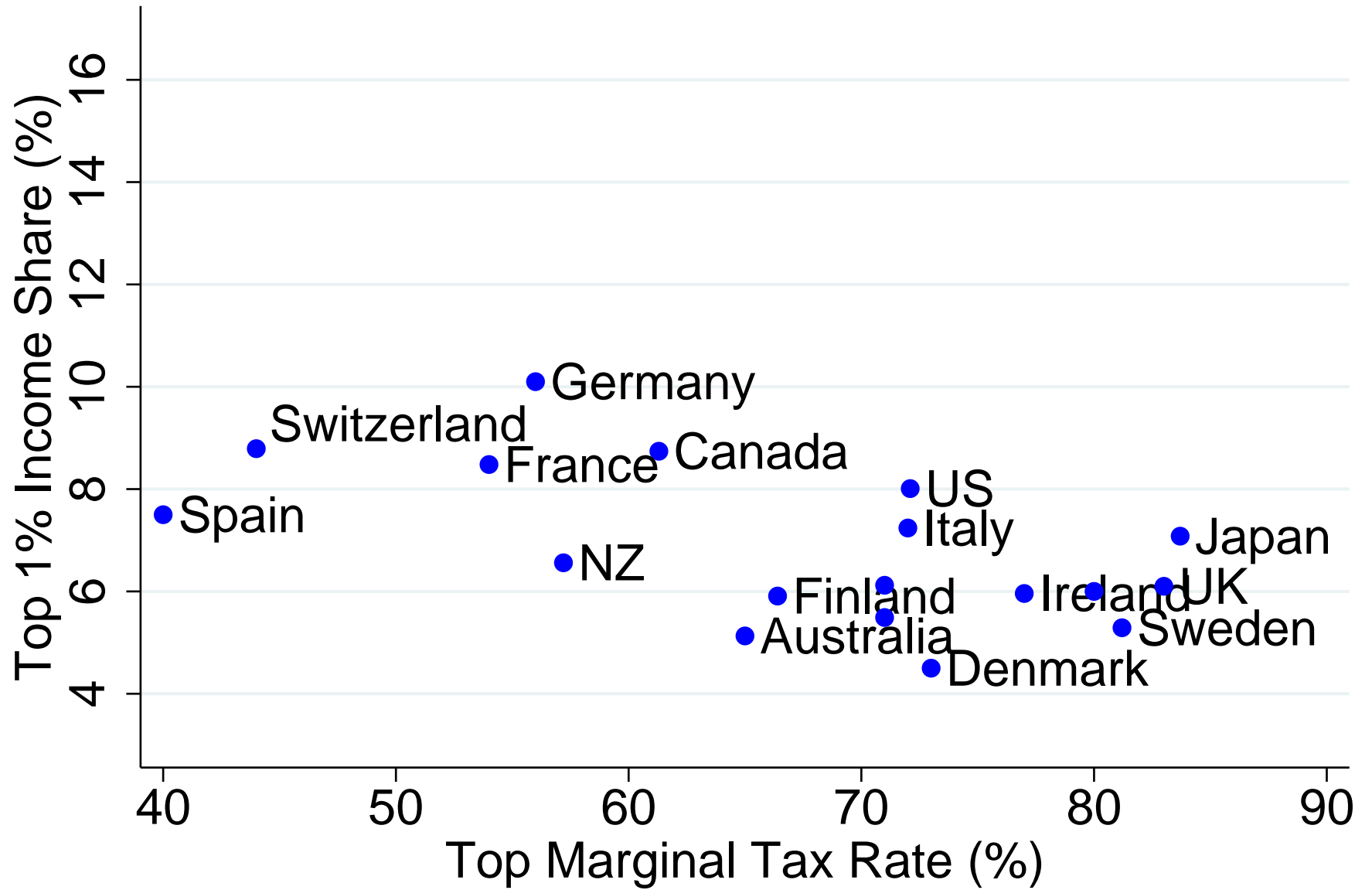


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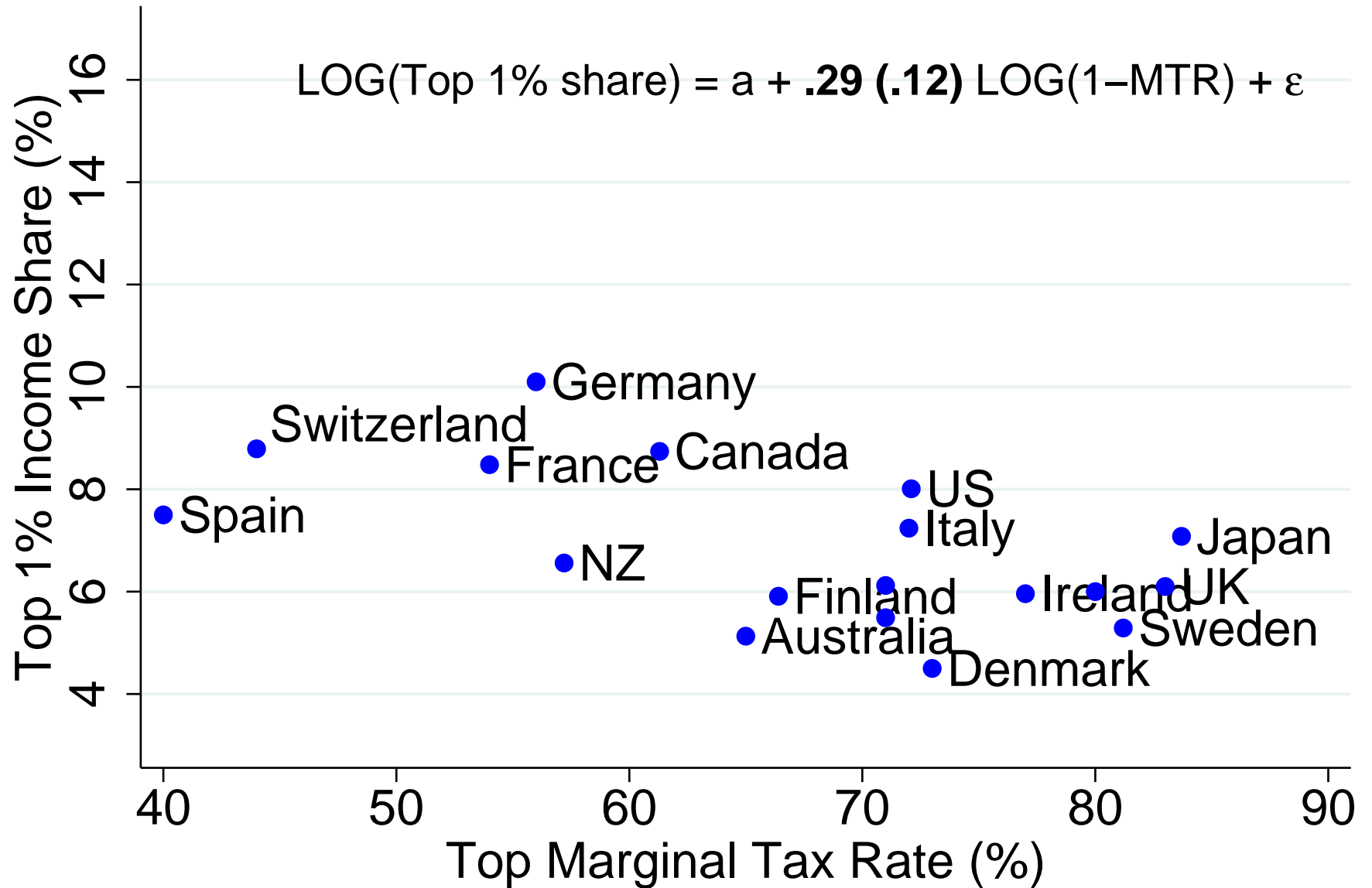


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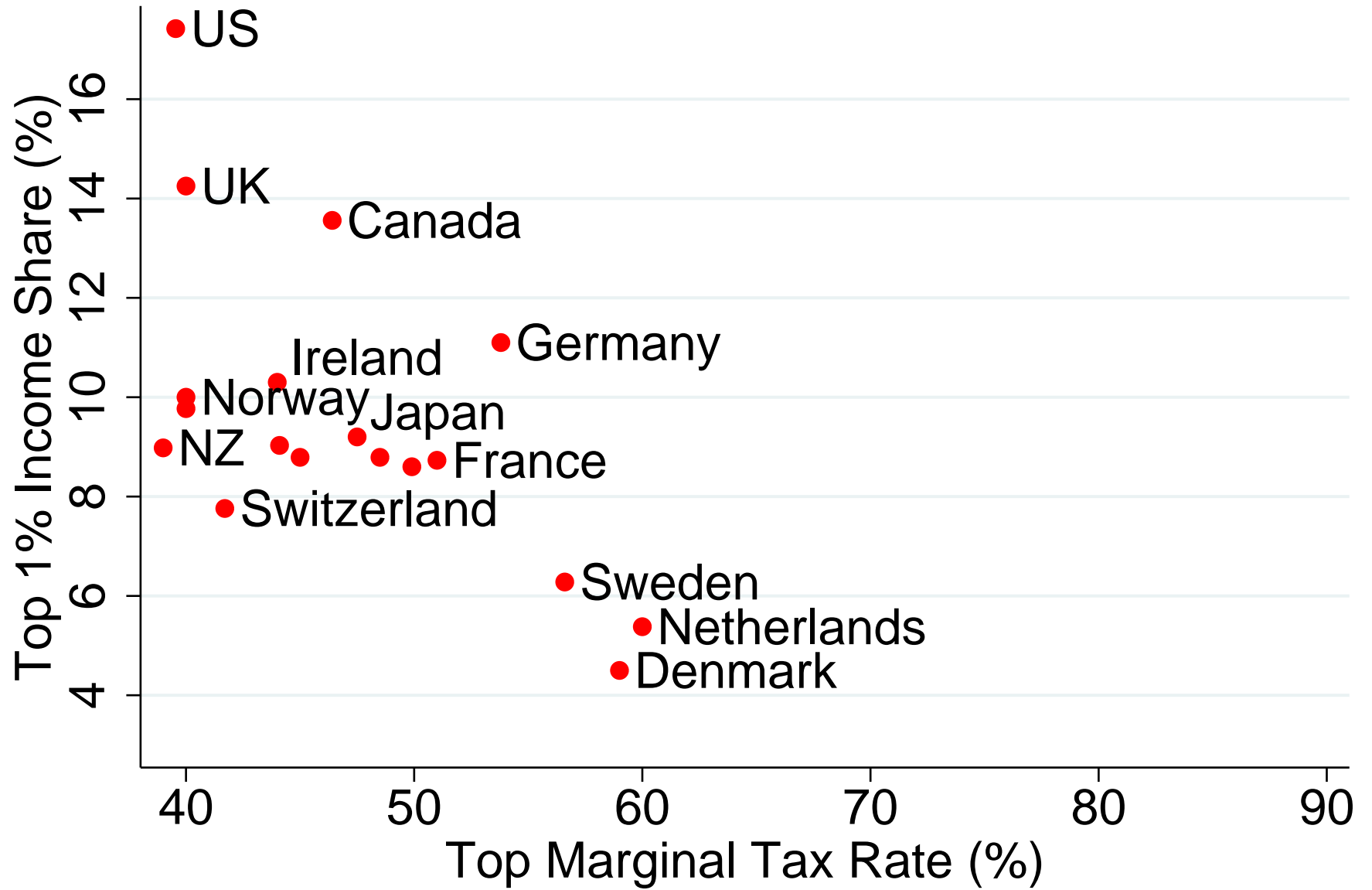
# Top MTR and Top 1% Income Share around 1975



## Top MTR and Top 1% Income Share around 1975

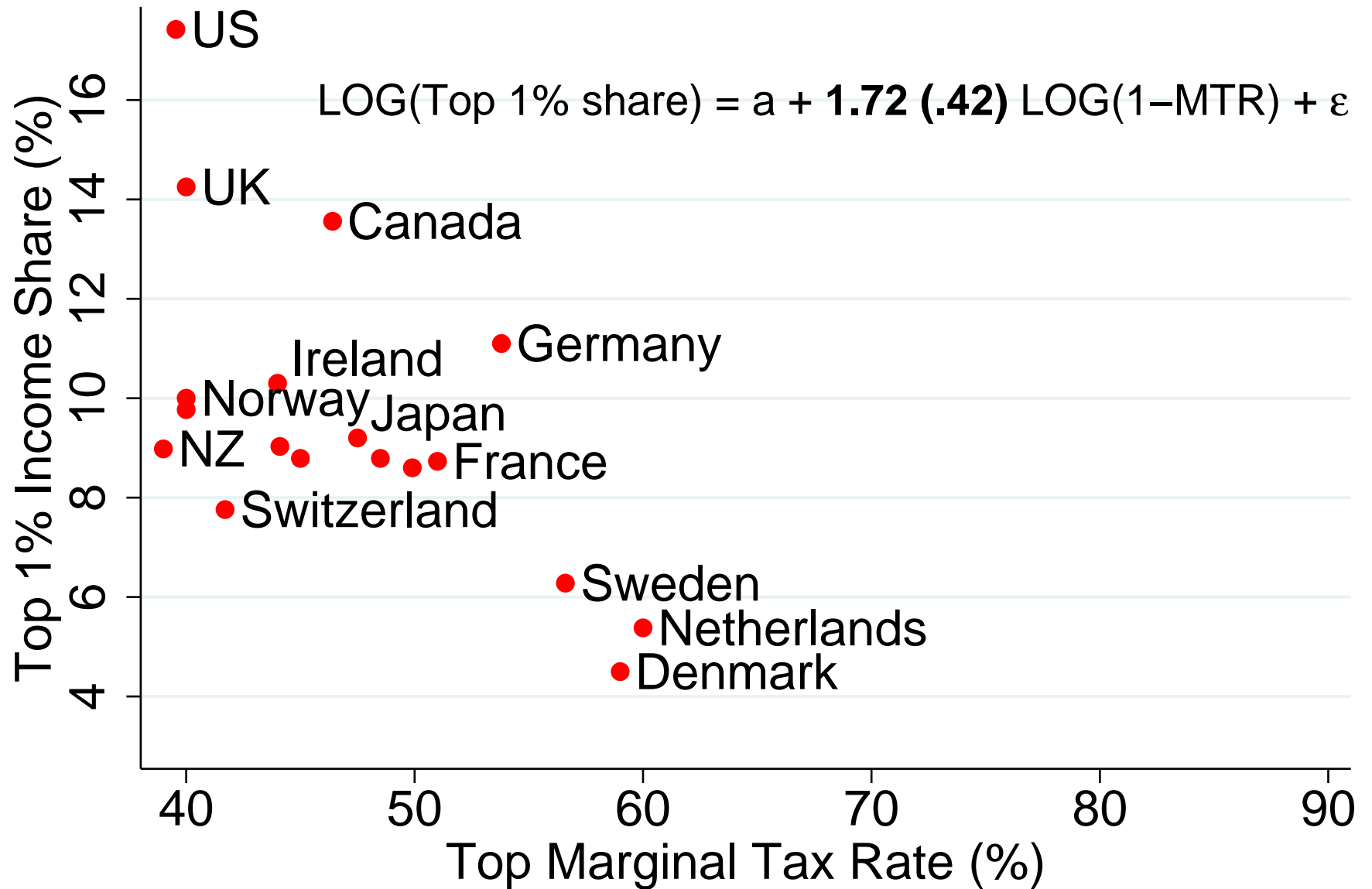


# Top MTR and Top 1% Income Share around 2005

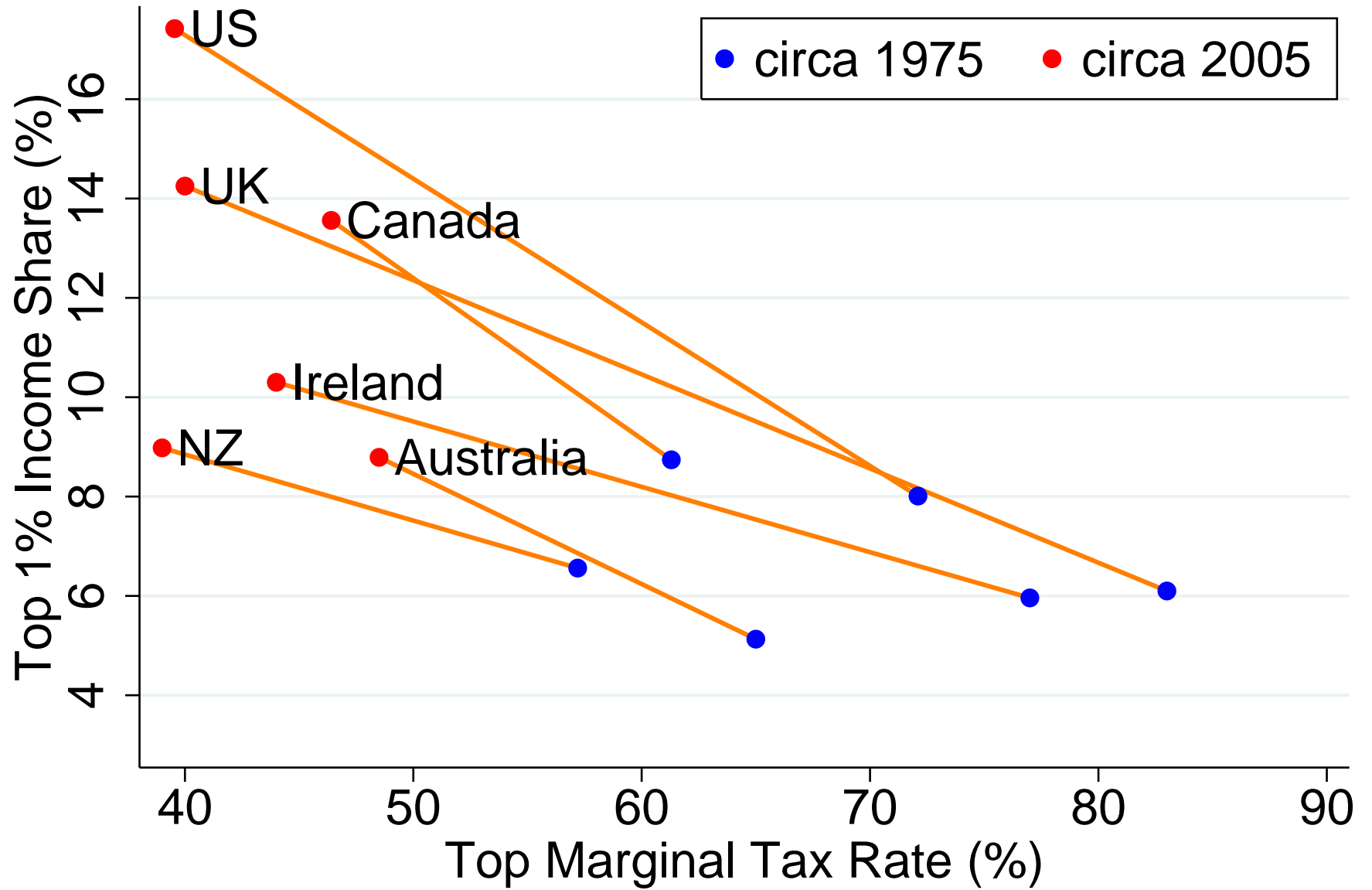




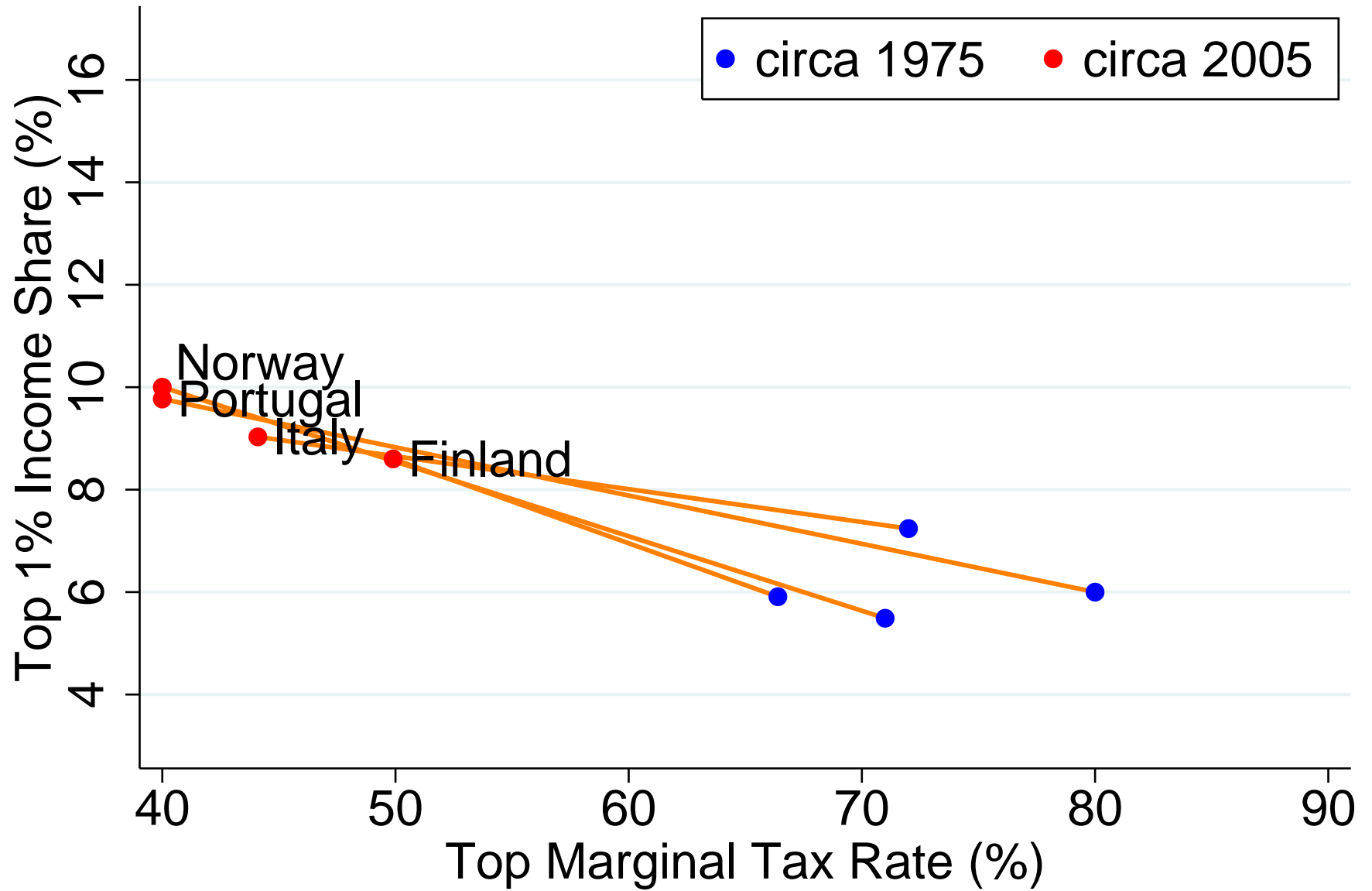
# Top MTR and Top 1% Income Share around 2005



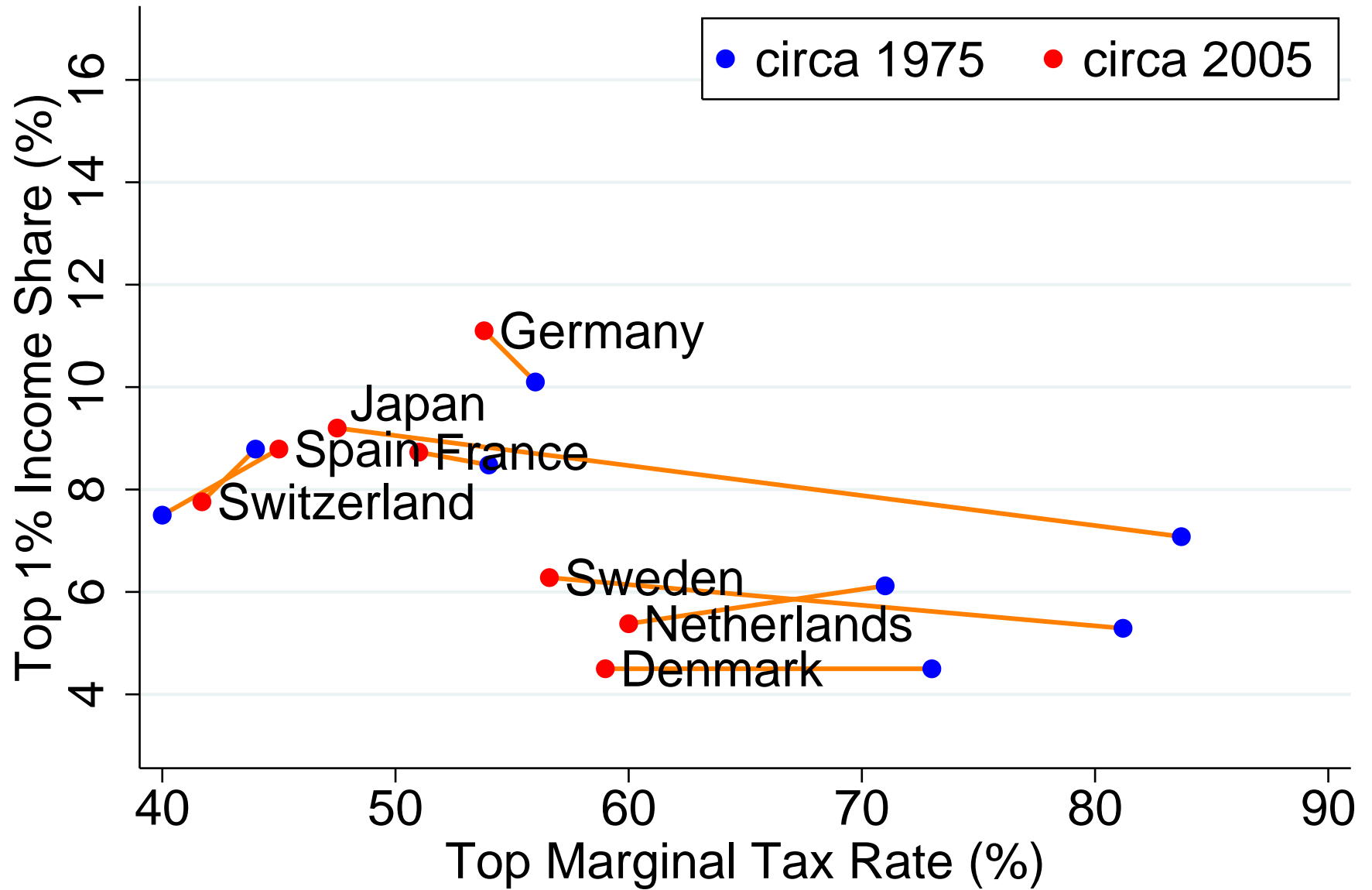
# Top MTR and Top 1% Income Share: 2005 vs. 1975



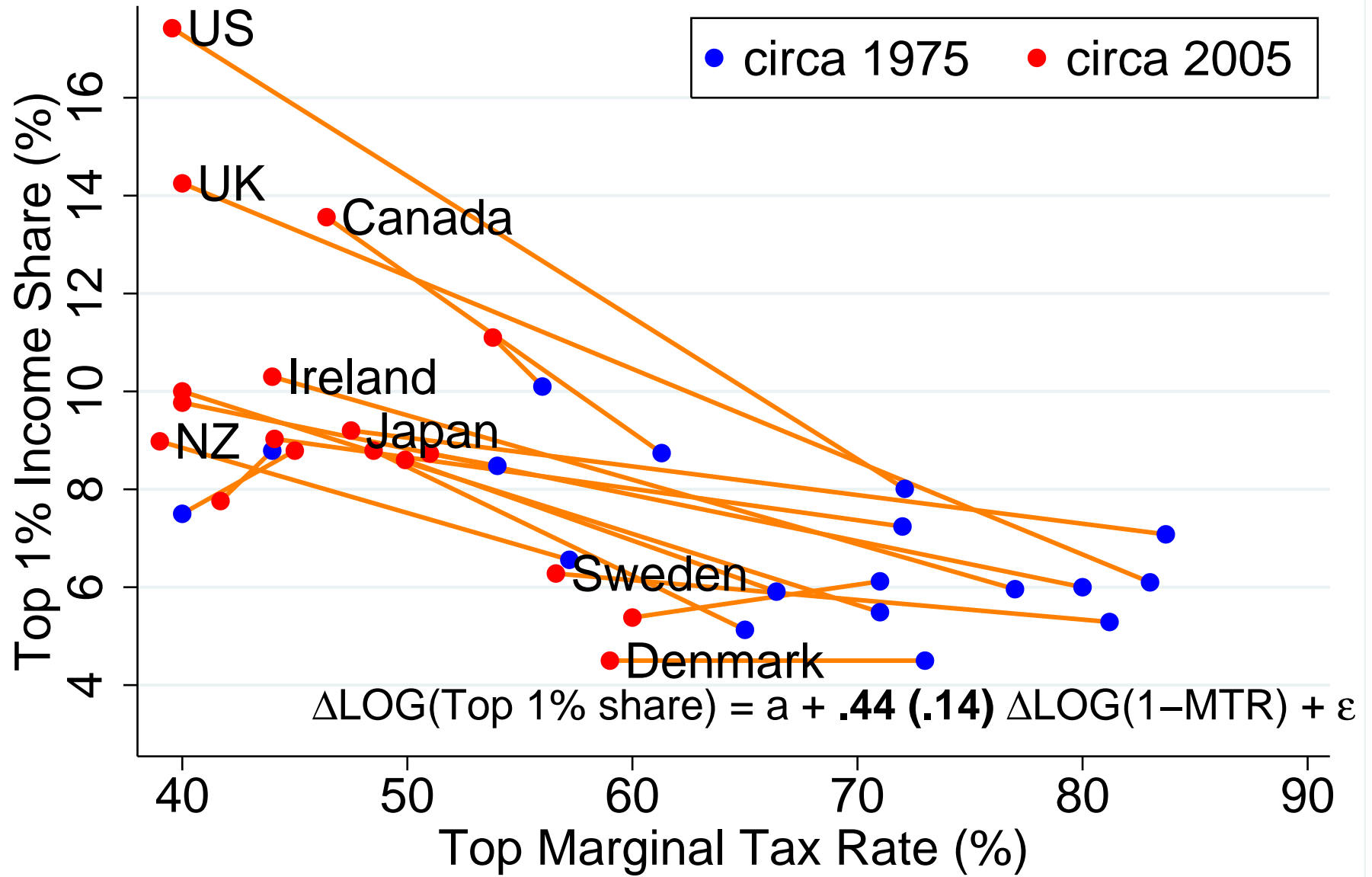
# Top MTR and Top 1% Income Share: 2005 vs. 1975



# Top MTR and Top 1% Income Share: 2005 vs. 1975



# Top MTR and Top 1% Income Share: 2005 vs. 1975



## TOP RATES AND TOP INCOMES OECD EVIDENCE

1) All English speaking countries display strong link between large top tax rate cuts and top pre-tax income share increases. Effect strongest in the US

2) Some countries (part of Scandinavia and Southern Europe) display some link between large top rate cuts and top income share increases

3) Some countries (Japan, part of Scandinavia, Netherlands) display almost no link between large top rate cuts and top income share increases

⇒ Response to top tax rates is very heterogeneous

## WHY HAVE TOP US INCOMES SURGED?

- 1) **Technology/Globalization** has favored skilled workers: cannot explain why top shares have not increased much in Japan-continental Europe
- 2) **Supply side:** Top earners work and earn more because of lower top rates: cannot explain why top shares have not increased in some of the countries that lowered tax rates
- 3) **Tax avoidance:** Inequality has not changed but less avoidance (and hence higher reported incomes) due to lower rates: Cannot explain continuous surge in US top income shares since 1989
- 4) **Institutions:** Regulations, tax policy, social norms shape level of top income shares through relative bargaining power: high top rates are one brake to top incomes surge

## TAX POLICY IMPLICATIONS

- 1) **Technology/Globalization:** Pareto  $a$  decreases (from 2 to 1.5 in the US),  $e$  stable,  $\tau$  should increase somewhat
- 2) **Supply side:** Large  $e$  implies that decreasing top tax rates was highly desirable
- 3) **Tax avoidance:** High tax rates and narrow base is inefficient. With broad base, top tax rate can potentially be higher
- 4) **Institutions:** If top tax rates moderate top pay through bargaining effects then high rates desirable (unless top talent is underpaid)



## CAN HIGH TOP RATES BE JUSTIFIED?

Super high tax rates can only be justified if there is a market failure making top incomes **inefficiently** too high

1930s Roosevelt: wealthy had business monopolies “malefactors of great wealth.” Today, 2 reasons to curb top pay

1) Low taxes may have helped fuel finance bubble

2) CEOs might be overpaid because collude with board of directors to increase their pay at the expense of small shareholders ⇒ CEO pay can be excessive because it does not take into account the best interests of small shareholders

## **PERSPECTIVES FOR REFORMING US TOP TAX RATES**

Income concentration will fall sharply during crisis but fall will be permanent only if tax progressivity increases substantially [contrast 1921 to 1932]

Politically, now might be the best moment to (a) close tax avoidance channels and (b) increase top tax rates [possibly going beyond Clinton tax system]

Income and Estate Tax reform needs to be framed as tax increase on the top 1% [top income earners engineered the bubble, profited from it, and are partly to blame for subsequent crisis]

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