# Lecture 1: Introduction to Graduate Public Economics

**Stefanie Stantcheva**

Fall 2022

# Hello! I am Stefanie Stantcheva

My research:

I study the taxation of firms and individuals. I focus on three main issues:

1) The long-run effects of taxes on innovation, education & training, and wealth. How can we design the tax system to foster innovation? To foster investments in education (student loan issue)?

2) The determinants of our social preferences, attitudes, and perceptions, which ultimately drive support for redistribution and policies. Social Economics Lab that runs large-scale online surveys and experiments.
http://socialeconomicslab.org/

3) The effects of taxes in imperfect markets with informational frictions and rents.

# Our Goals for this Class

- Learn skills and methods (theory and empirical).
- Create your own repertoire of key & interesting papers and read widely.
- Get you inspired and ready for your own research.

  Three good quotes from Einstein to keep in your pocket for gloomy days:

  *"If we knew what it was we were doing, it would not be called research, would it?"*

  *"Genius is 1% talent and 99% hard work..."*

  *"Everybody is a genius. But if you judge a fish by its ability to climb a tree it will live its whole life believing that it is stupid."*

- Do all this while having fun! No, really. That's the only way. Even if it's type II fun. Feel free to share fun things too!

# Class Logistics

- Meet twice per week, 1.15 hours.
- Participate! Class time is for discussions too; materials can be shifted to next lecture or recorded.
- One referee report (posted 9/21, due 10/12).
- One paper proposal (due around finals time). See guidelines in Canvas and sign up to brainstorm together.
- Starting September 21st, pleas sign up for short slots to tell us your ideas for 10 mins at the start of class, so we all learn something. Will be the occasion to discuss applications of what we learn in class.
- One final exam (during finals week, date set by registrar, this year 12/9).
- Office hours: Tuesdays 6-7 starting next week (sign-up through link on syllabus). if more slots needed, speak up!
- Independent but related: Reading group Tuesdays 5-6 pm on zoom (ec2907).
- Feel free to give feedback to Mike and/or me (always appreciated).

# PUBLIC ECONOMICS DEFINITION

Public economics = Study of the role of the government in the economy

Government is instrumental in most aspects of economic life:

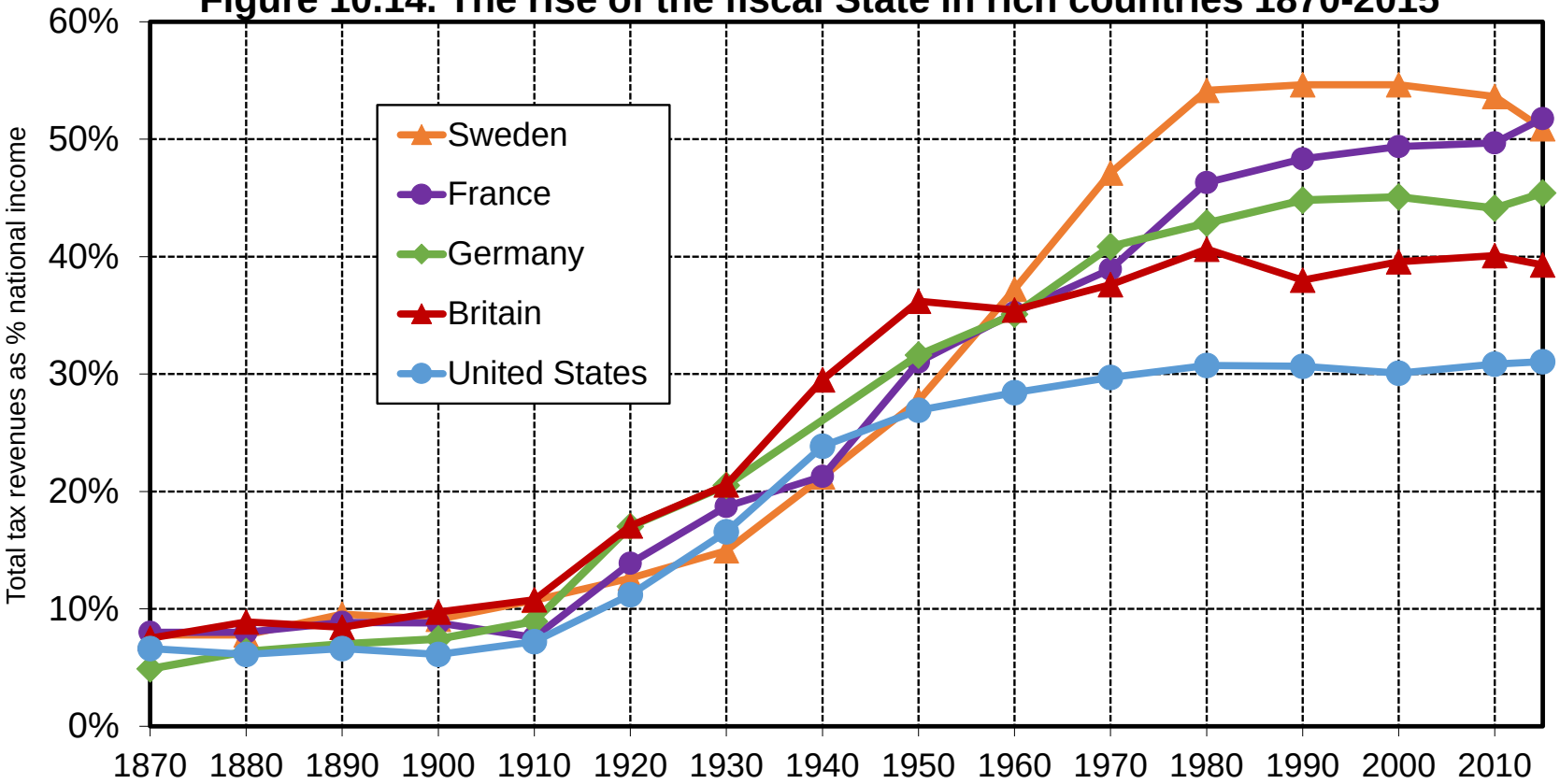
1) Government in charge of huge regulatory structure

2) Taxes: governments in advanced economies collect 30-50% of National Income in taxes

3) Expenditures: tax revenue funds traditional **public goods** (infrastructure, public order and safety, defense), and **welfare state** (education, retirement benefits, health care, income support)

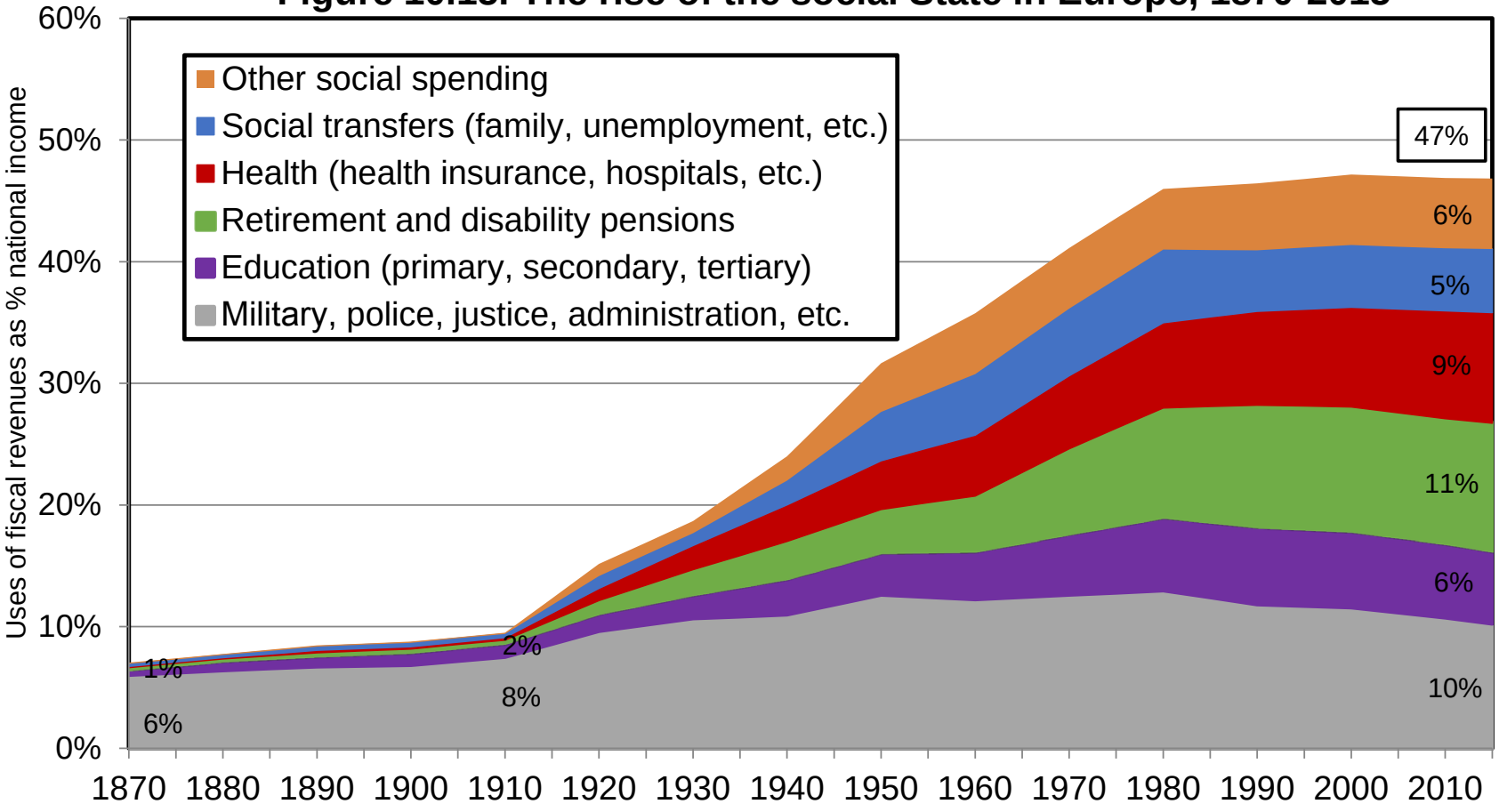
4) Macro-economic stabilization through central bank (interest rate, inflation control), fiscal stimulus, bailout policies

## Figure 10.14. The rise of the fiscal State in rich countries 1870-2015




**Interpretation**. Total fiscal revenues (all taxes and social contributions included) made less than 10% of national income in rich countries during the 19th century and until World War 1, before rising strongly from the 1910s-1920s until the 1970s-1980s and then stabilizing at different levels across countries: around 30% in the U.S., 40% in Britain and 45%-55% in Germany, France and Sweden.
Sources and series: see piketty.pse.ens.fr/ideology.

## Figure 10.15. The rise of the social State in Europe, 1870-2015




**Interpretation.** In 2015, fiscal revenues represented 47% of national income on average in Western Europe et were used as follows: 10% of national income for regalian expenditure (army, police, justice, general administration, basic infrastructure: roads, etc.); 6% for education; 11% for pensions; 9% for health; 5% for social transfers (other than pensions); 6% for other social spending (housing, etc.). Before 1914, regalian expenditure absorbed almost all fiscal revenues. **Note.** The evolution depicted here is the average of Germany, France, Britain and Sweden (see figure 10.14). Sources and séries: see piketty.pse.ens.fr/ideology.

# Bigger view on government

Saez (2021) AEA Lecture + Paper: Historically, economists have had a narrow minded view of individual behavior: selfish, rational, and utility based on own consumption only.

Social interactions are critical for humans: we naturally cooperate at many levels: families, communities, nation states, global treaties.

Governments are a formal way to organize cooperation

Archaic human societies depended on social cooperation for protection and taking care of the young, sick, and old

$\Rightarrow$ Explains best why our modern nation states have defense and provide education, health care, and retirement benefits

Replacing social institutions by markets does not always work

E.g., Retirement benefits: Saving for your own retirement is economically rational but in practice most people unable to do so unless institutions (employers/government) help them

Economics is clearly changing. This is why "Social Economics" so important.

## For Economists: Two General Rules for Government Intervention

1) Failure of 1st Welfare Theorem: Government intervention can help if there are market or individual failures. Markets first, government second. Why?

2) Fallacy of the 2nd Welfare Theorem: Distortionary Government intervention is required to reduce economic inequality

## Role 1: 1st Welfare Theorem Failure

**1st Welfare Theorem:** If (1) no externalities, (2) perfect competition, (3) perfect information, (4) agents are rational, then private market equilibrium is Pareto efficient

Government intervention may be desirable if:

1) Externalities require government interventions (Pigouvian taxes/subsidies, public good provision)

2) Imperfect competition requires regulation (typically studied in Industrial Organization)

3) Imperfect or Asymmetric Information (e.g., adverse selection may call for mandatory insurance)

4) Agents are not rational (= **individual failures** analyzed in behavioral economics, field in huge expansion): e.g., myopic or hyperbolic agents may not save enough for retirement

# 1. Externalities

Markets may be incomplete (e.g., smoking, pollution).

Achieving the Coasian efficient solution requires a coordinating institution, such as a government.

Public goods (infrastructure, defense, education).

Important question: what public goods to provide, how to correct for externalities.

## 2. Imperfect competition

Role for government regulation when markets are not competitive.

We will see some of this when we study R&D policies and innovation.

Typically we leave this to IO, but we shouldn't!

## 3. Imperfect and asymmetric information

Adverse Selection in health insurance (reason for mandated coverage).

Capital markets and credit constraints (subsidies for education).

Intergenerational issues (future generations may not be valued appropriately in today's market).

# 4. Individual Failures

Behavioral issues, own-agency problems.

In many situations, individuals may not or do not seem to act in their best interests [e.g., many individuals are not able to save for retirement]

Two Polar Views on such situations:

1) **Individual Failures [Behavioral Economics View]** Individual Failures exist: Self-control problems, Cognitive Limitations

2) **Paternalism [Libertarian View]** Individual failures do not exist and govt wants to impose on individuals its own preferences against individuals' will

Key way to distinguish those 2 views: Under Paternalism, individuals should be opposed to govt programs such as Social Security. If individuals understand they have failures, they will tend to support govt programs such as Social Security. Currently very active area of research, theoretically and empirically.

## Role 2: 2nd Welfare Theorem Fallacy

Even with no market failures, free market might generate substantial inequality. Inequality is an issue because of people care about their relative situation.

**2nd Welfare Theorem:** Any Pareto Efficient outcome can be reached by (1) Suitable redistribution of initial endowments [individualized **lump-sum** taxes based on indiv. characteristics and not behavior], (2) Then letting markets work freely

$\Rightarrow$ No conflict between efficiency and equity [1st best taxation]

Redistribution of initial endowments is not feasible (information pb) $\Rightarrow$ govt needs to use **distortionary** taxes and transfers $\Rightarrow$ Trade-off between efficiency and equity [2nd best taxation]

This class will focus on both roles, but first on 2).

## Illustration of 2nd Welfare Theorem Fallacy

Suppose economy is populated 50% with disabled people unable to work (hence they earn \$0) and 50% with able people who can work and earn \$100

**Free market outcome:** disabled have \$0, able have \$100

**2nd welfare theorem:** govt is able to tell apart the disabled from the able [even if the able do not work]

$\Rightarrow$ can tax the able by \$50 [regardless of whether they work or not] to give \$50 to each disabled person $\Rightarrow$ the able keep working [otherwise they'd have zero income and still have to pay \$50]

**Real world:** govt can't tell apart disabled from non working able

$\Rightarrow$ \$50 tax on workers + \$50 transfer on non workers destroys all incentives to work $\Rightarrow$ govt can no longer do full redistribution $\Rightarrow$ Trade-off between equity and size of the pie

## Normative vs. Positive Public Economics

**Normative Public Economics:** Analysis of How Things Should be (e.g., should the government intervene in health insurance market? how high should taxes be?, etc.)

**Positive Public Economics:** Analysis of How Things Really Are (e.g., Does govt provided health care crowd out private health care insurance? Do higher taxes reduce labor supply?)

Positive Public Economics is a required 1st step before we can complete Normative Public Economics

Positive analysis is primarily empirical and Normative analysis is primarily theoretical

Positive Public Economics overlaps with Labor Economics

**Political Economy** is a positive analysis of govt outcomes [public choice is political economy from a libertarian view]

## Macro-aggregates: Labor vs. Capital Income

National Income = GDP - depreciation of capital + net foreign income

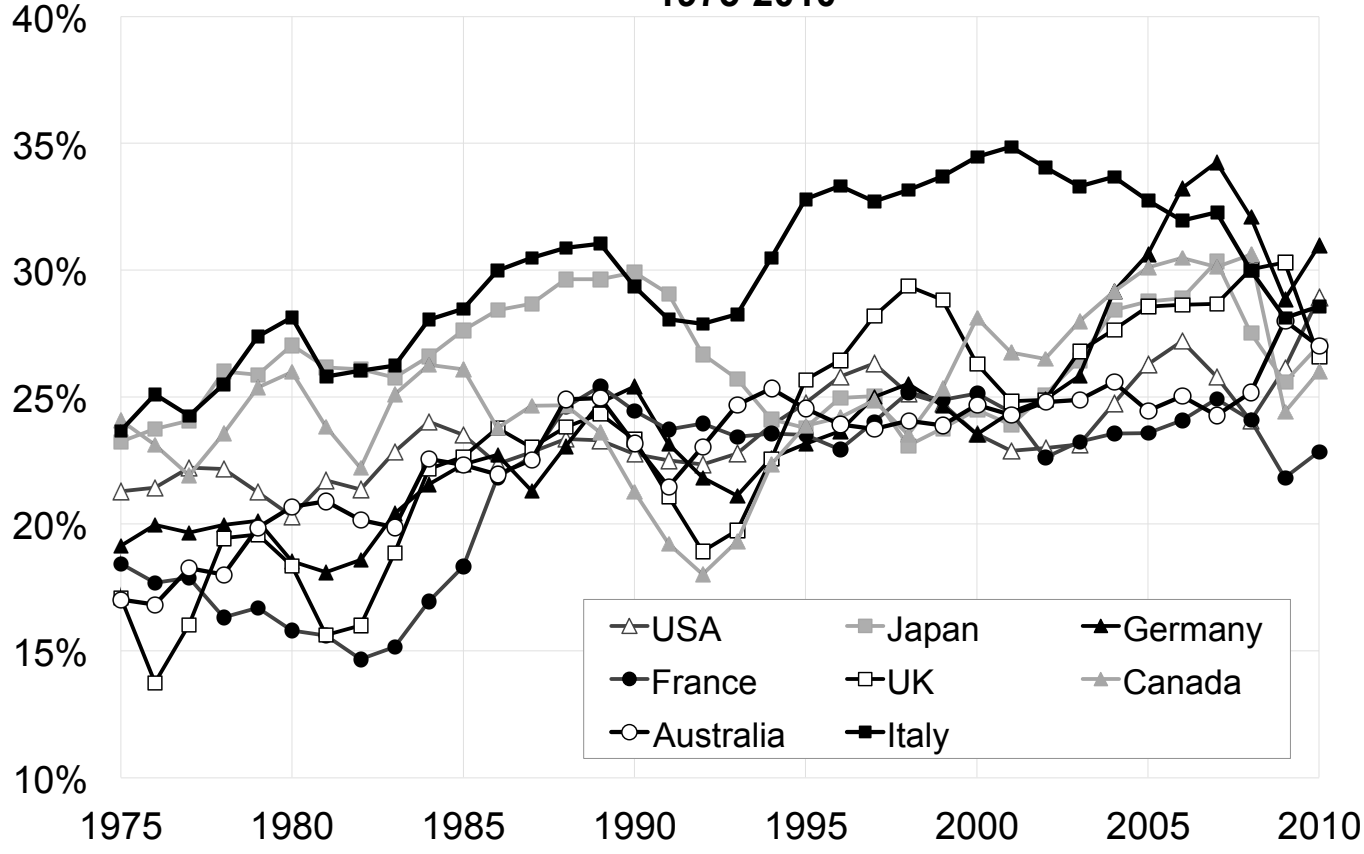
Labor income $wl \simeq$ 70-75% of national income $z$

Capital income $rk \simeq$ 25-30% of national income $z$ (has increased in recent decades)

In GDP, gross capital share is higher (35%) because it includes depreciation of capital ($\simeq 10\%$ of GDP)

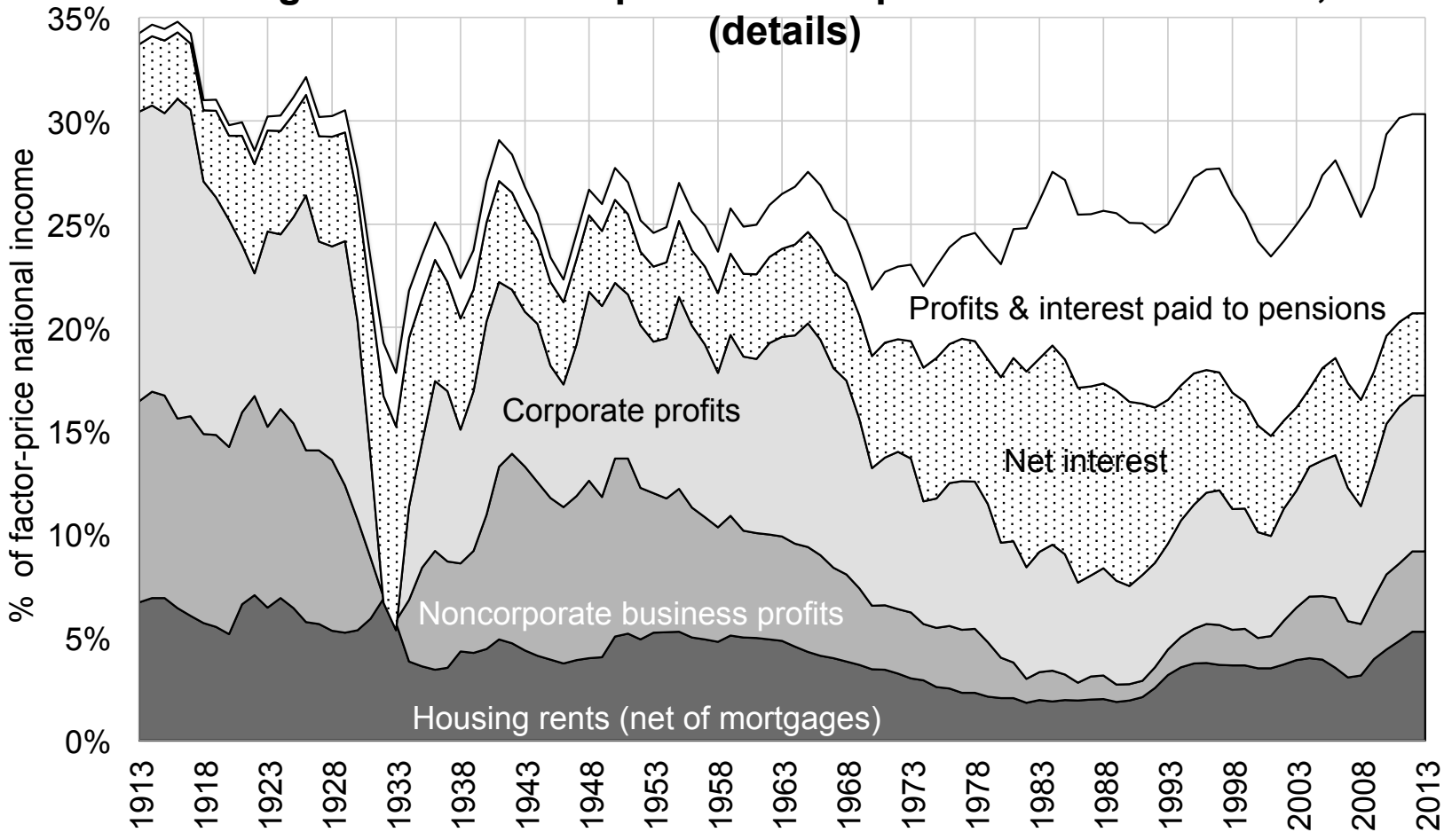
Capital income is income from wealth: housing rents, profits of businesses and corporations, interest on fixed claim assets minus interest paid on debt

**Figure 12: Capital shares in factor-price national income 1975-2010**




Source: Piketty and Zucman (2014)

**Figure A6: The composition of capital income in the U.S., (details)**



## Macro-aggregates: Wealth and Capital Income

Wealth arises from expected future income and value of assets

Private wealth includes real estate (land+buildings), corporate and business equity, fixed claimed assets (bonds+deposits), net of debts (mortgage, student loans, consumer credit)

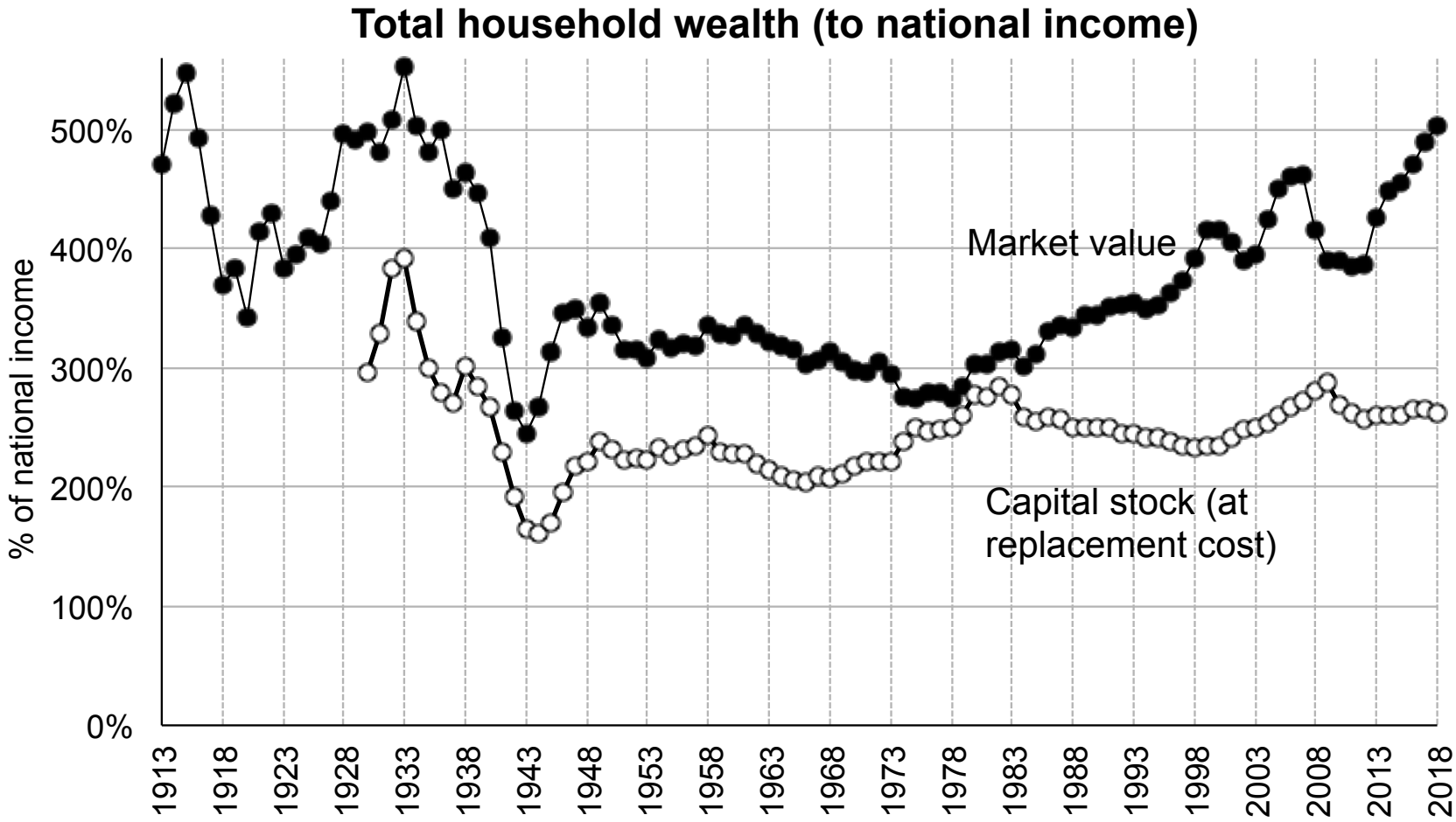
Aggregate US Private Wealth $\approx 6 \times$ Annual National Income (big increase in recent years)

Private wealth reflects both capital stock accumulated through savings and pure price effects

Example 1: house can increase in value because it is improved (capital) or because local prices go up (pure price effect)

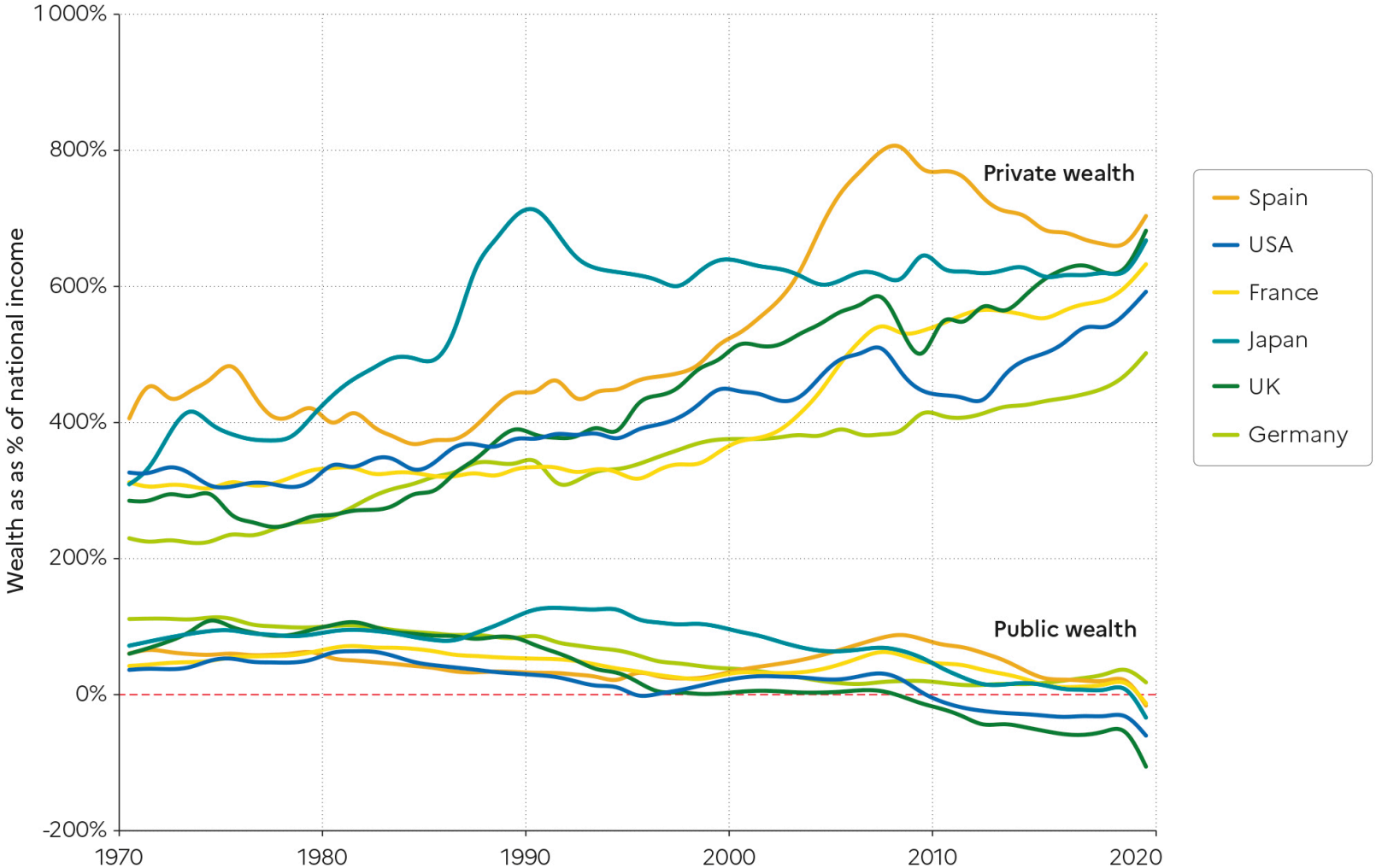
Example 2: greater monopoly power makes a business more valuable to owners (but at the expense of consumers)

Recent increase in US private wealth may stem mostly from price effects




This figure depicts the share of total household wealth relative to national income Source: Piketty, Saez, and Zucman (2018).

**Figure 8** ***The rise of private versus the decline of public wealth in rich countries, 1970-2020***




***Interpretation:*** *Public wealth is the sum of all financial and non-financial assets, net of debts, held by governments. Public wealth dropped from 60% of national income in 1970 to -106% in 2020 in the UK.* ***Sources and series:*** *wir2022.wid.world/methodology, Bauluz et al. (2021) and updates.*

## Income Inequality: Labor vs. Capital Income

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

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)

Entrepreneurs start with labor which then transmutes into wealth (e.g., Zuckerberg with Facebook)

## Income Inequality Measurement

Inequality can be measured by indexes such as Gini, log-variance, quantile income shares which are functions of the income distribution $F(z)$

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 (top person has all the income)

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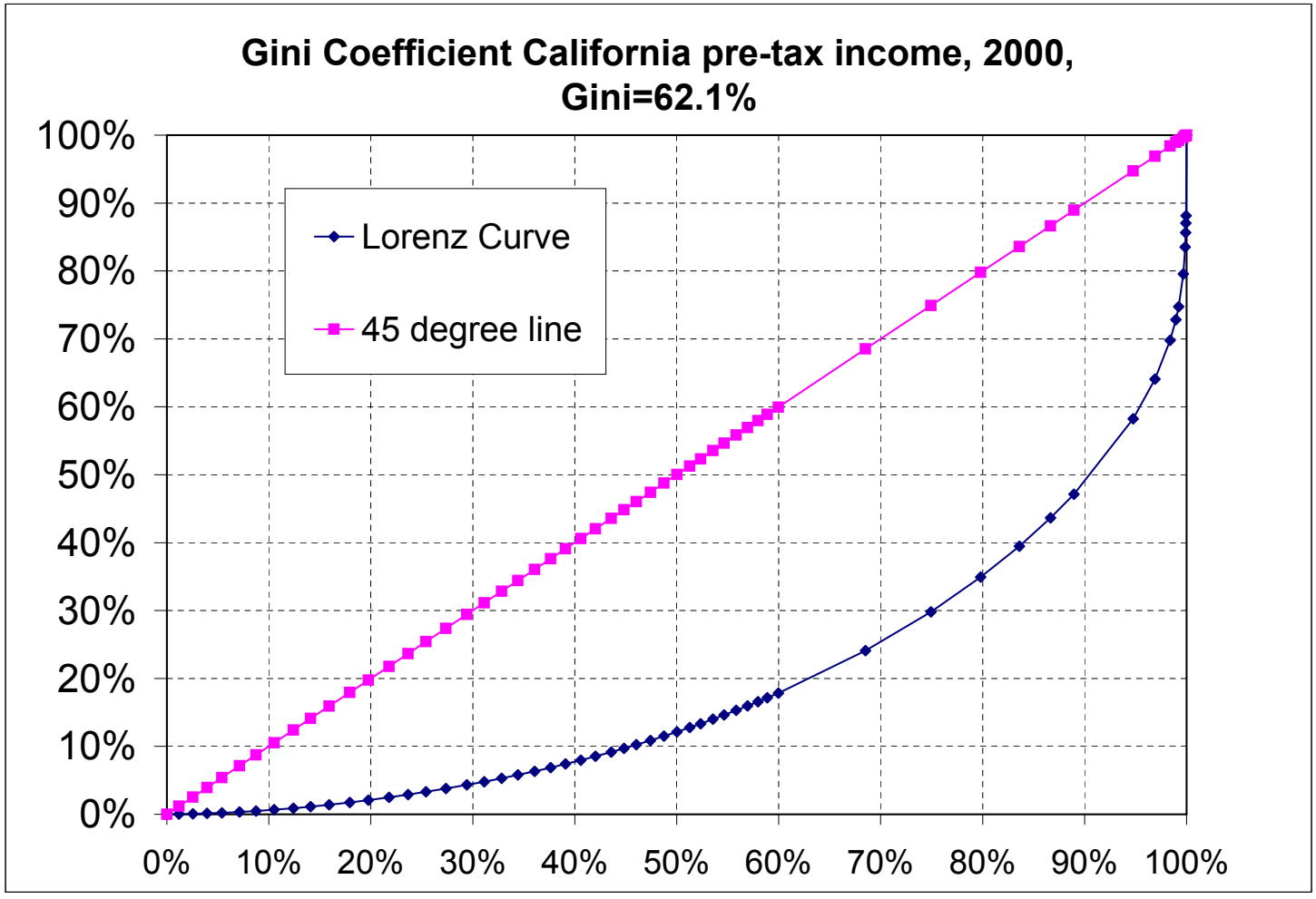



Source: Annual Report 2001 California Franchise Tax Board

## Key Empirical Facts on Income/Wealth Inequality

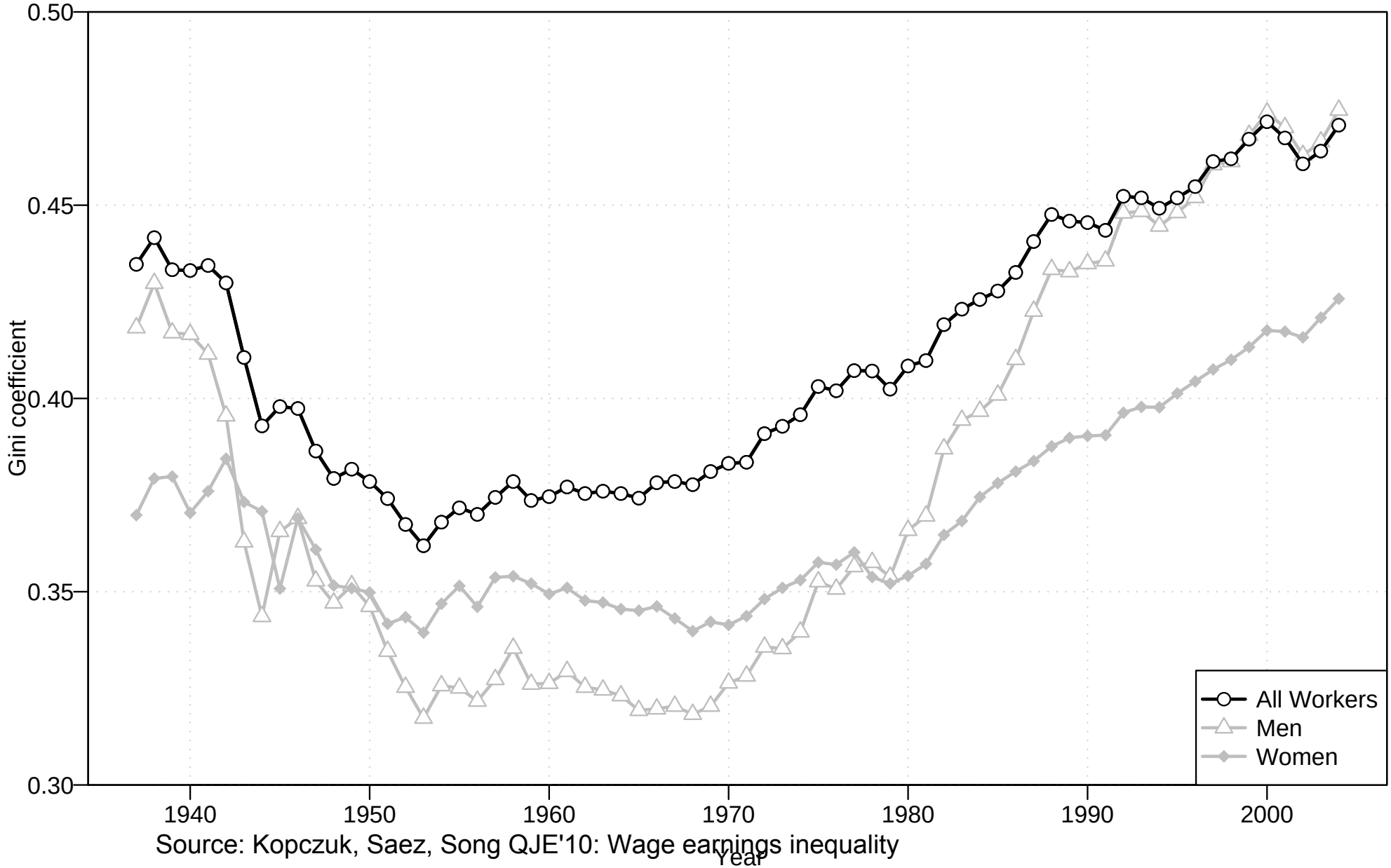
1) In the US, labor income inequality has increased substantially since 1970: due to skilled biased technological progress vs. institutions (min wage and Unions) [Autor-Katz'99]

2) US top income shares dropped dramatically from 1929 to 1950 and increased dramatically since 1980. Bottom 50% incomes have stagnated in real terms since 1980 [Piketty-Saez-Zucman '18 distribute full National Income]

3) Fall in top income shares from 1900-1950 happened in most OECD countries. Surge in top income shares has happened primarily in English speaking countries, and not as much in Continental Europe and Japan [Atkinson, Piketty, Saez JEL'11]

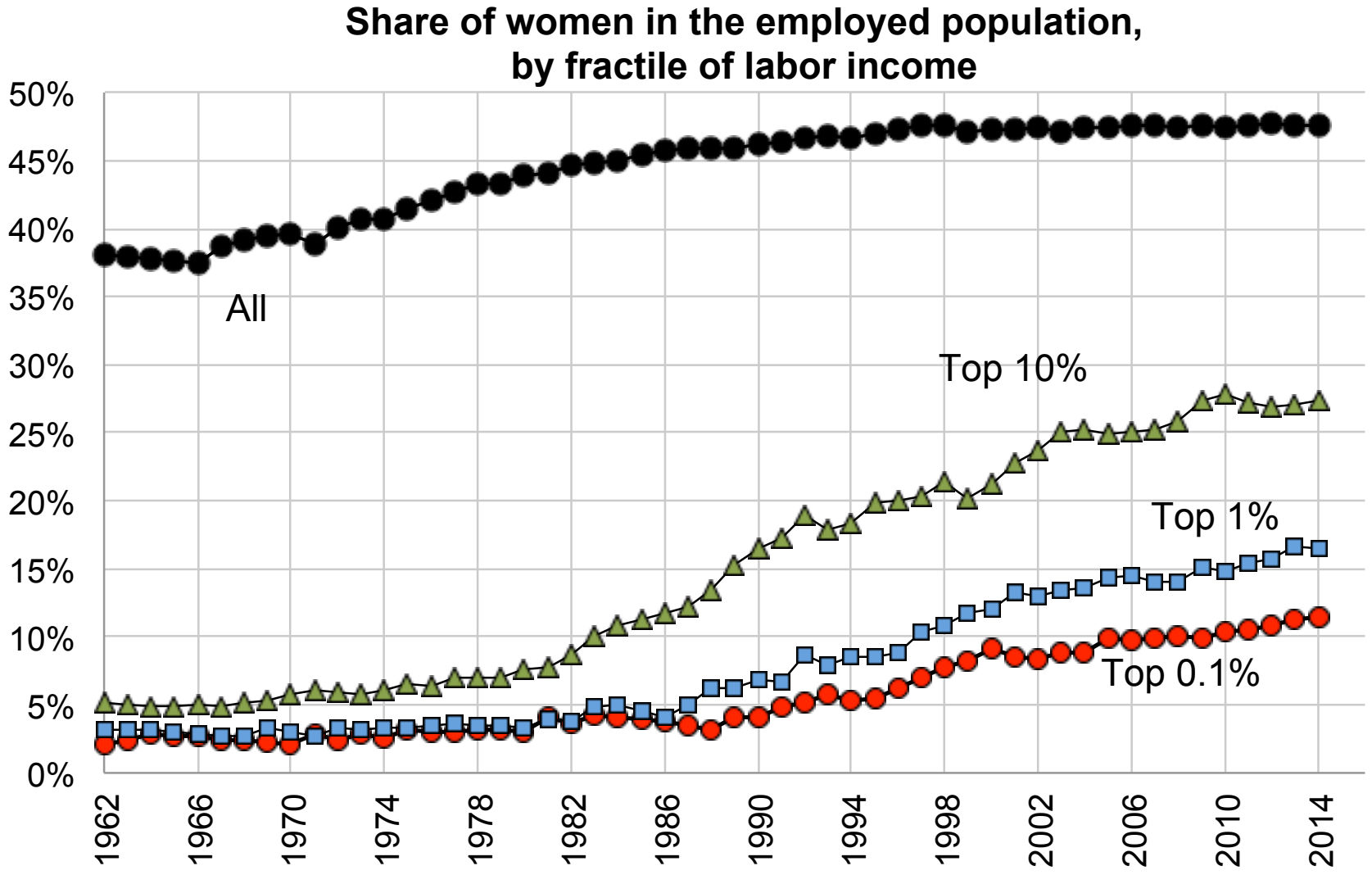
4) Gender gaps in income are still very pronounced. The same holds for racial gaps.

**Figure 1: Gini coefficient**



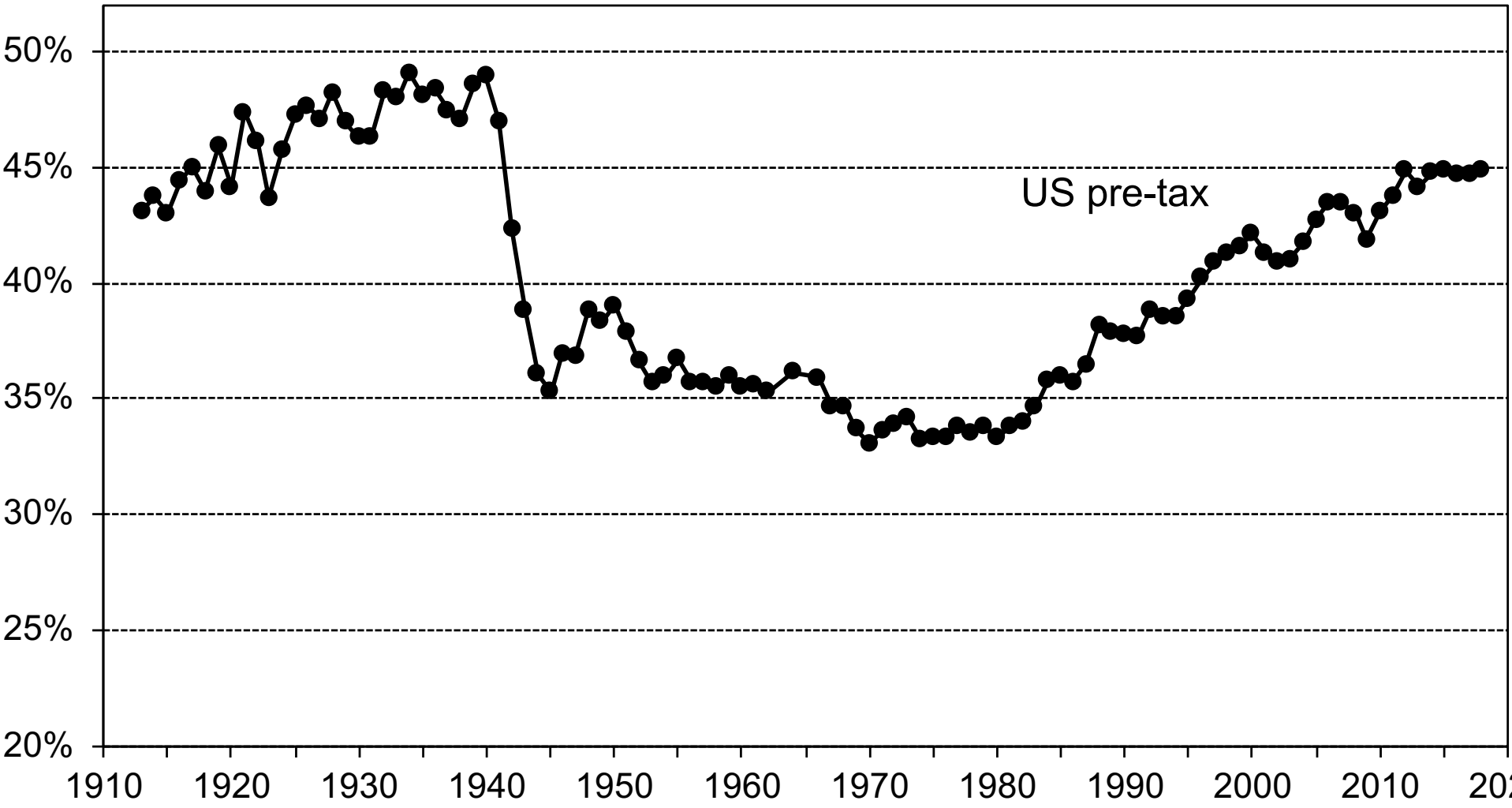

Source: Kopczuk, Saez, Song QJE'10: Wage earnings inequality

# Men still make 85% of the top 1% of the labor income distribution

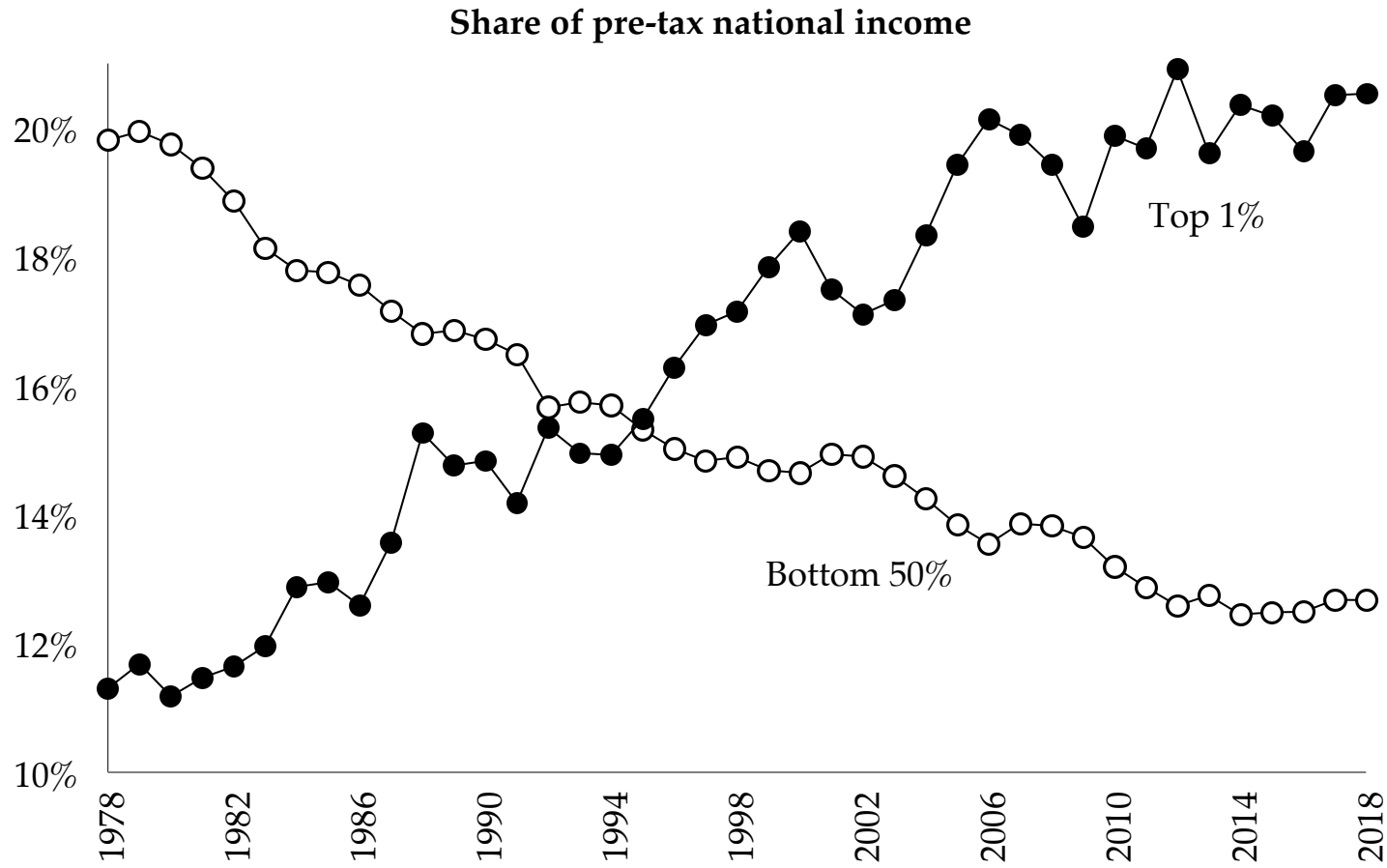



Source: Appendix Table II-F1.

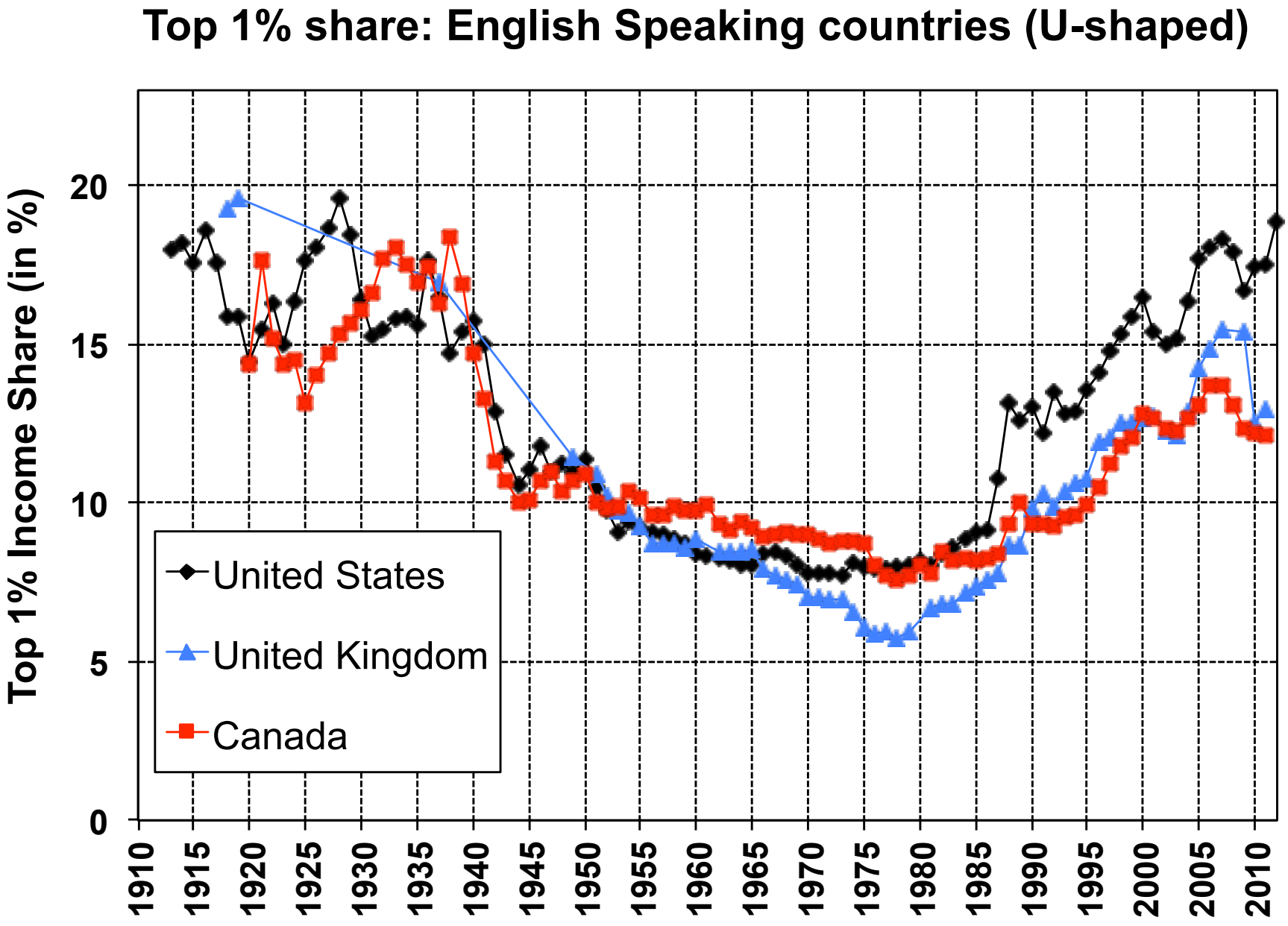
# Top 10% Pre-tax Income Share in the US, 1913-2018

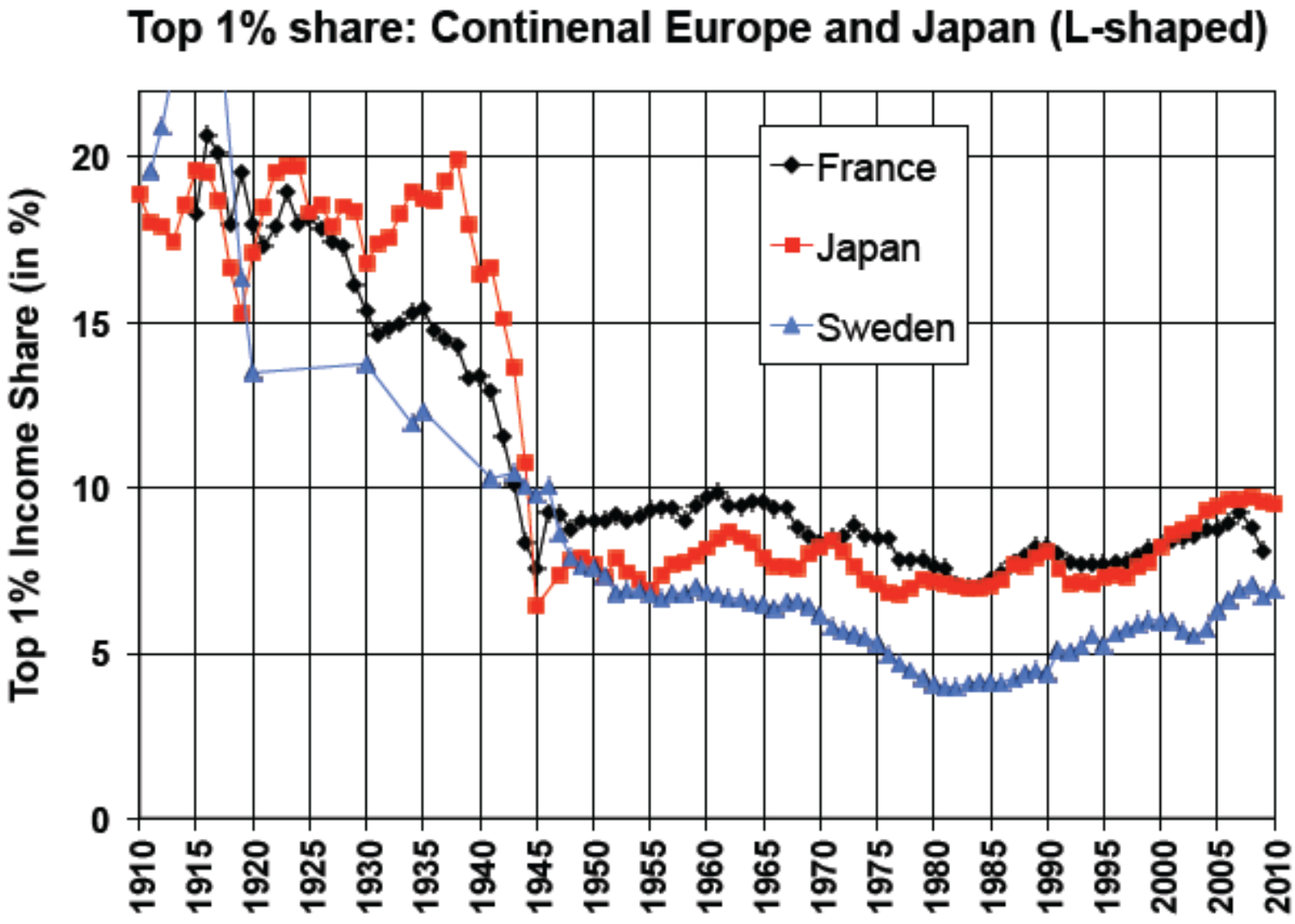



Top income shares of pretax national income among adults aged 20+ (income within couples equally split).
Source is World Inequality Database wid.world (from Piketty, Saez, Zucman 2018).




Source: Saez and Zucman (2019), Figure 1.1


Top 1% share: English Speaking countries (U-shaped)
Top 1% Income Share (in %)
0
5
10
15
20
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
United States
United Kingdom
Canada




Source: THE WORLD TOP INCOMES DATABASE

## Key Empirical Facts on Labor vs. Capital Income Inequality

Based on IRS tax returns data from Saez and Zucman (2015) for 2007.

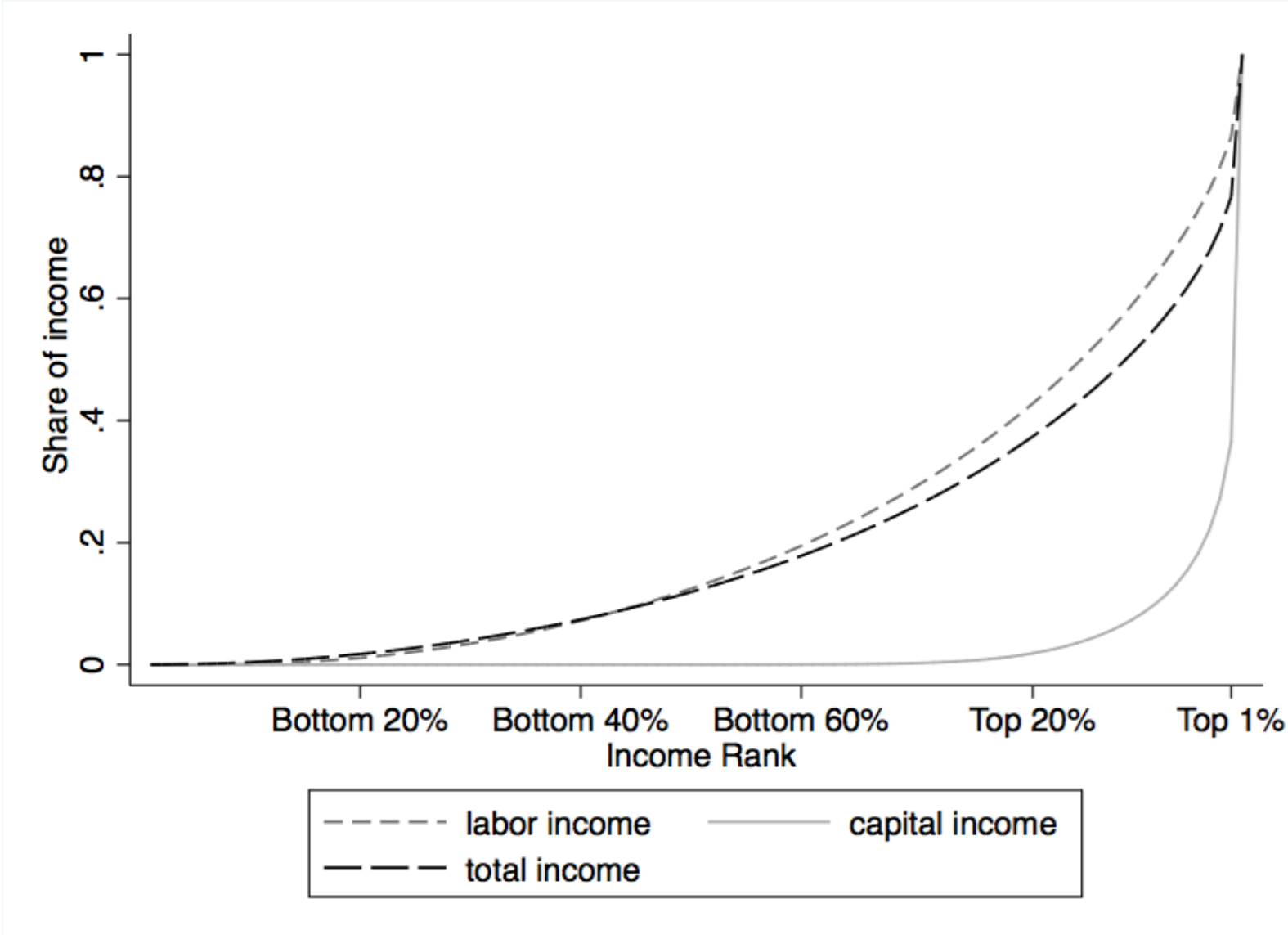
**Fact 1:** Capital income (or wealth) more unequally distributed than labor income.

> Top 1% wealth holders have 40% of total wealth (Saez and Zucman, 2016). Bottom 50% wealth holders hold almost no wealth.
>
> Top 1% incomes have 20% of total income on a pre-tax basis (Piketty, Saez, and Zucman, 2018)
>
> Top 1% labor income earners have about 15% of total labor income

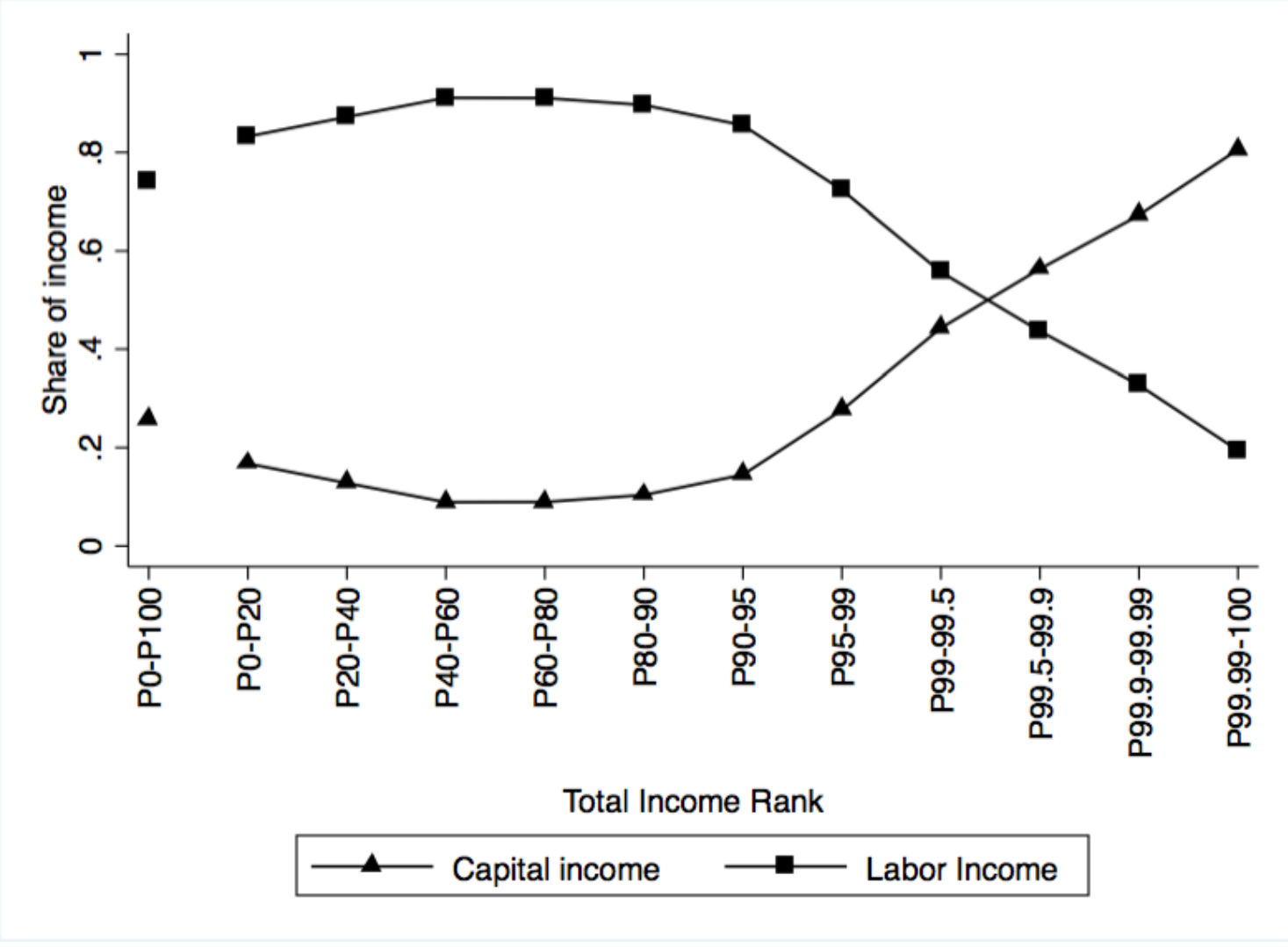
**Fact 2**: At the top, total income is mostly capital income.

**Fact 3**: Two-dimensional heterogeneity: even conditional on labor income, a lot of inequality in capital income.

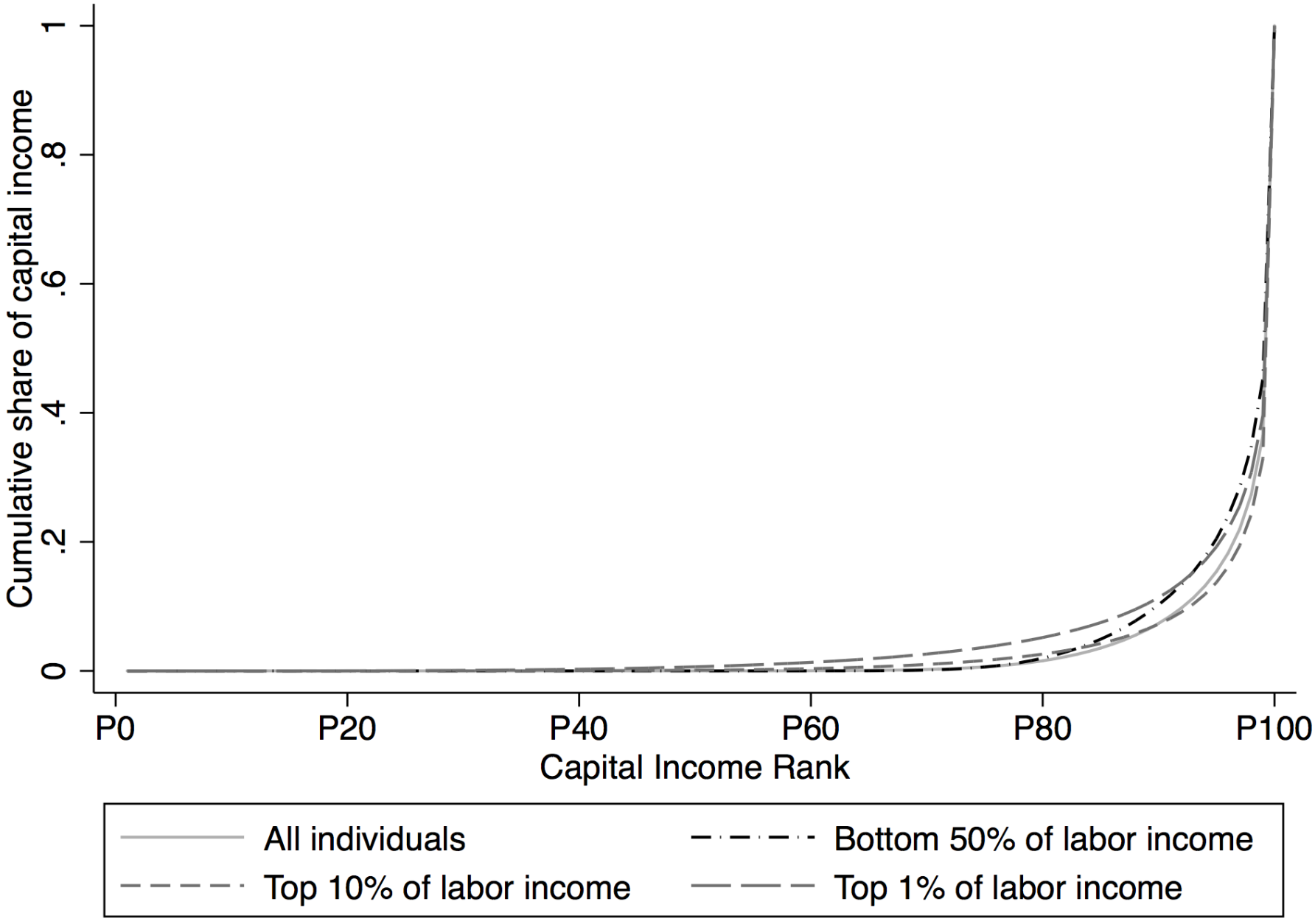
# Labor, Capital, and Total Income Distributions (Fact 1)



# Labor, Capital, and Total Income Distributions (Fact 2)



# Capital Income Conditional on Labor Income (Fact 3)



## Measuring Intergenerational Income Mobility

Strong consensus that children's success should not depend too much on parental income [Equality of Opportunity]

Studies linking adult children to their parents can measure link between children and parents income

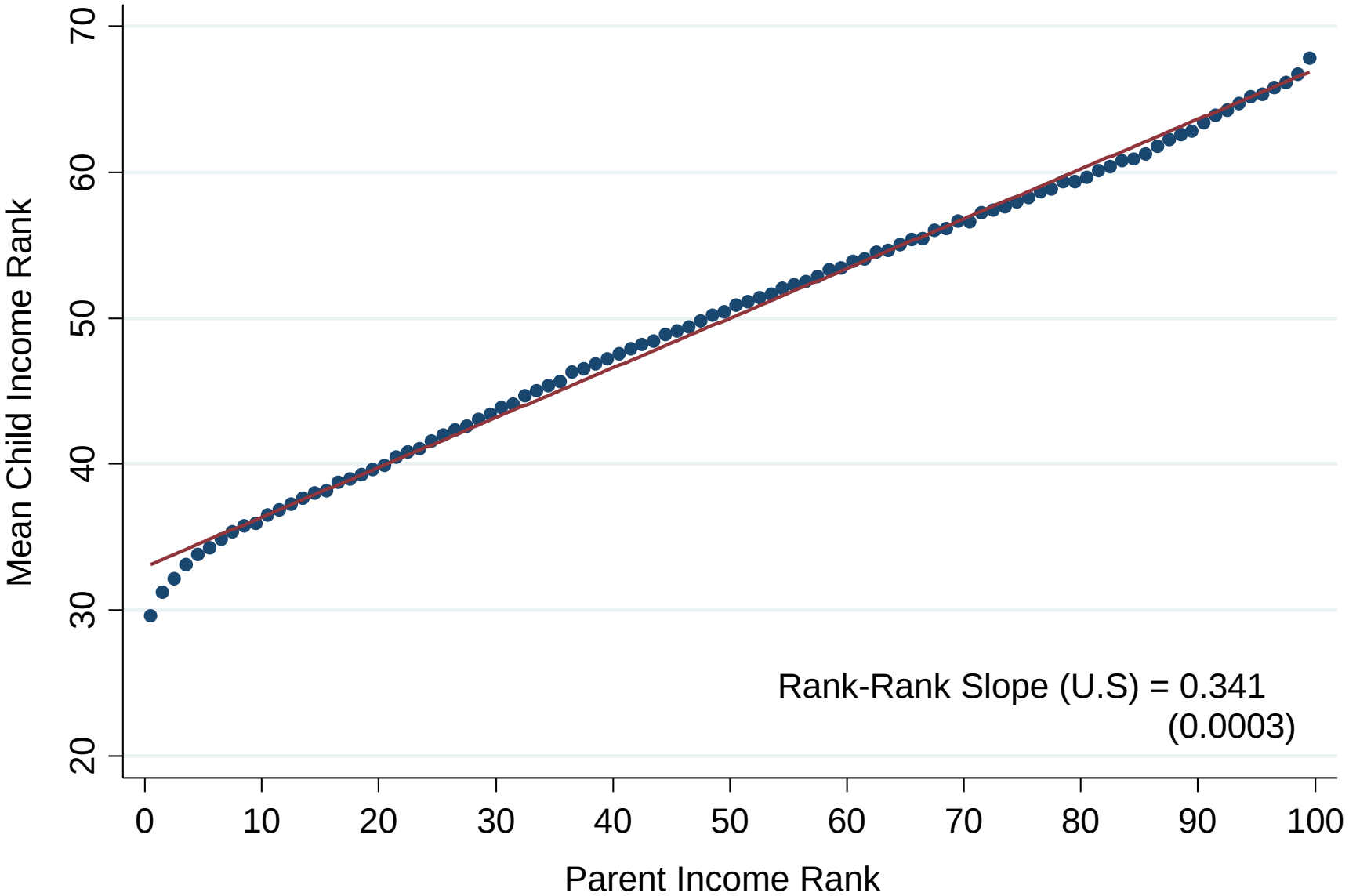
Simple measure: average income rank of children by income rank of parents [Chetty et al. 2014]

1) US has less mobility than European countries (especially Scandinavian countries such as Denmark)

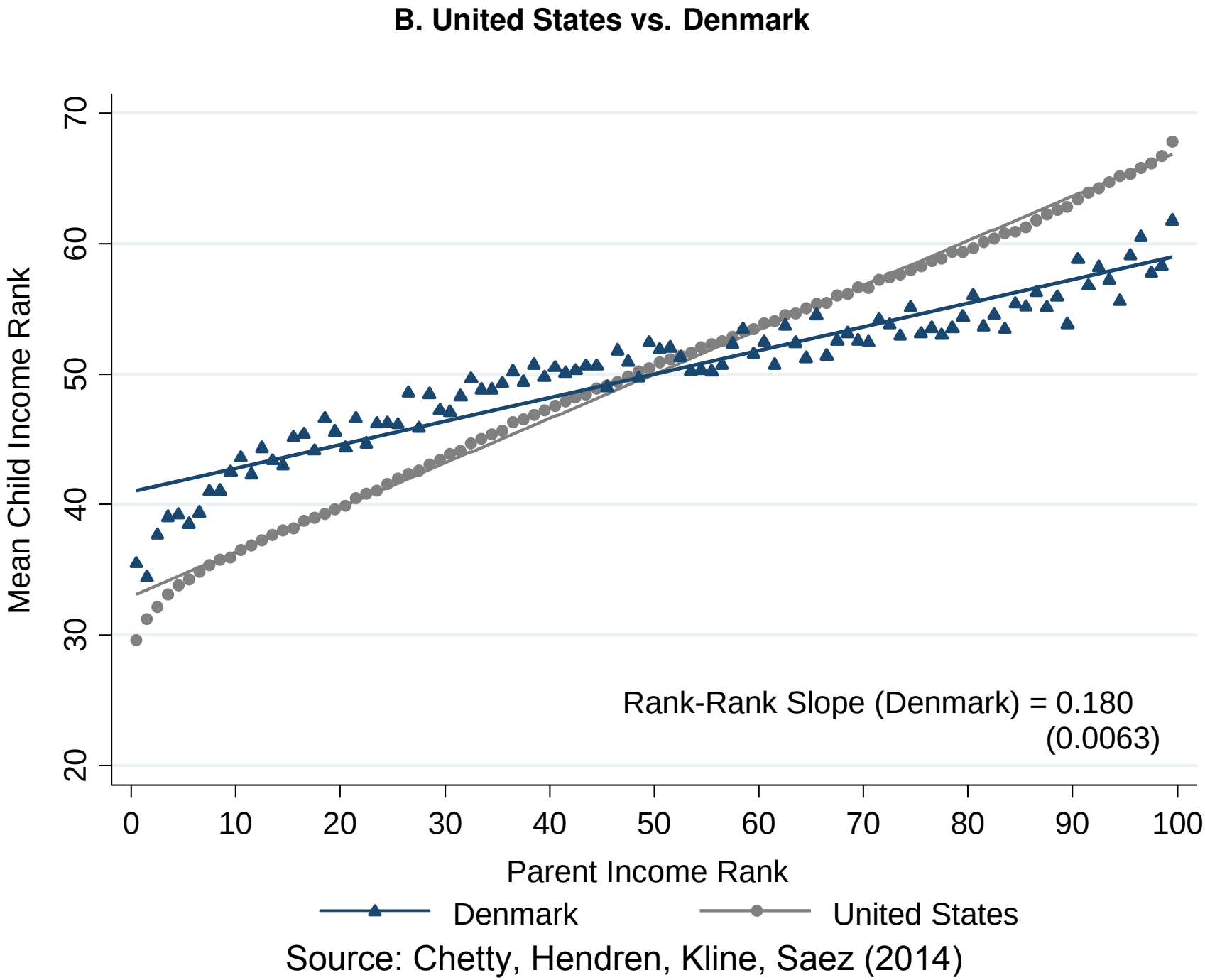
2) Substantial heterogeneity in mobility across cities in the US

3) Places with low race/income segregation, low income inequality, good K-12 schools, high social capital, high family stability tend to have high mobility [these are correlations and do not imply causality]

**A. Mean Child Income Rank vs. Parent Income Rank in the U.S.**



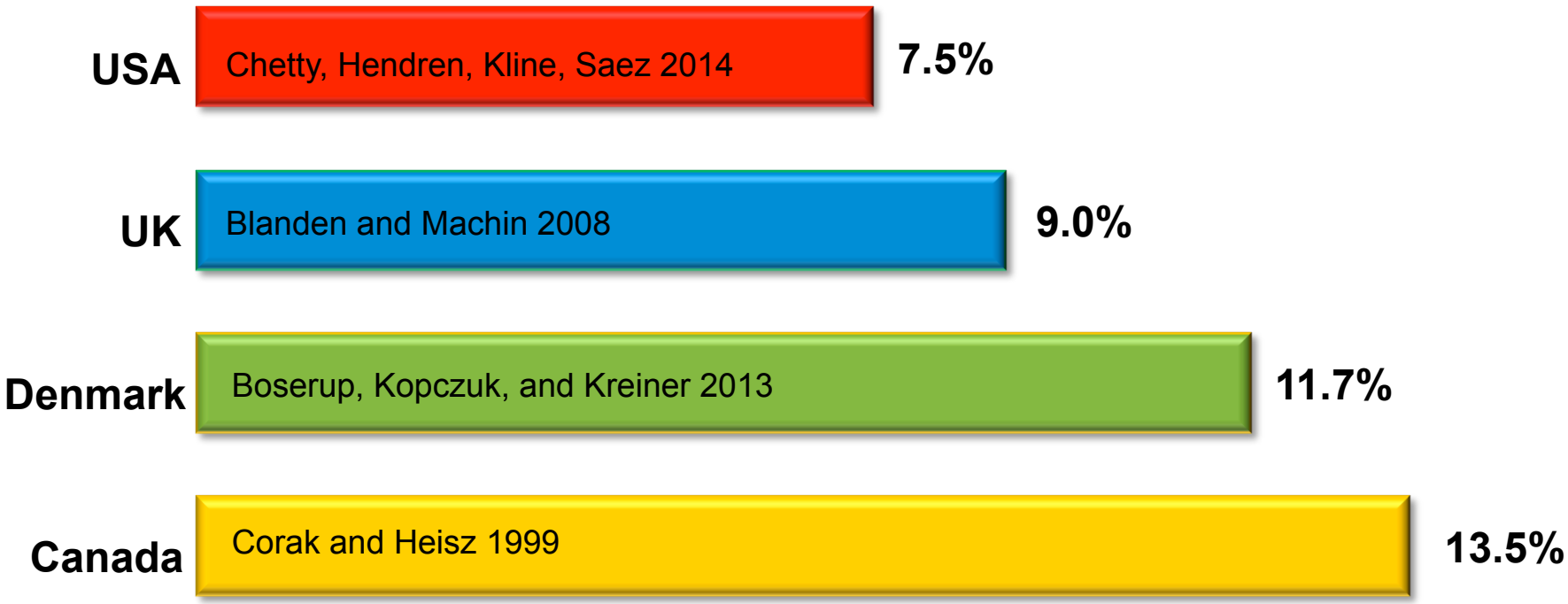

Source: Chetty, Hendren, Kline, Saez (2014)


B. United States vs. Denmark
Mean Child Income Rank
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80
90
100
Parent Income Rank
Rank-Rank Slope (Denmark) = 0.180
(0.0063)
Denmark
United States
Source: Chetty, Hendren, Kline, Saez (2014)

Source: Chetty et al. (2014)

# The American Dream?

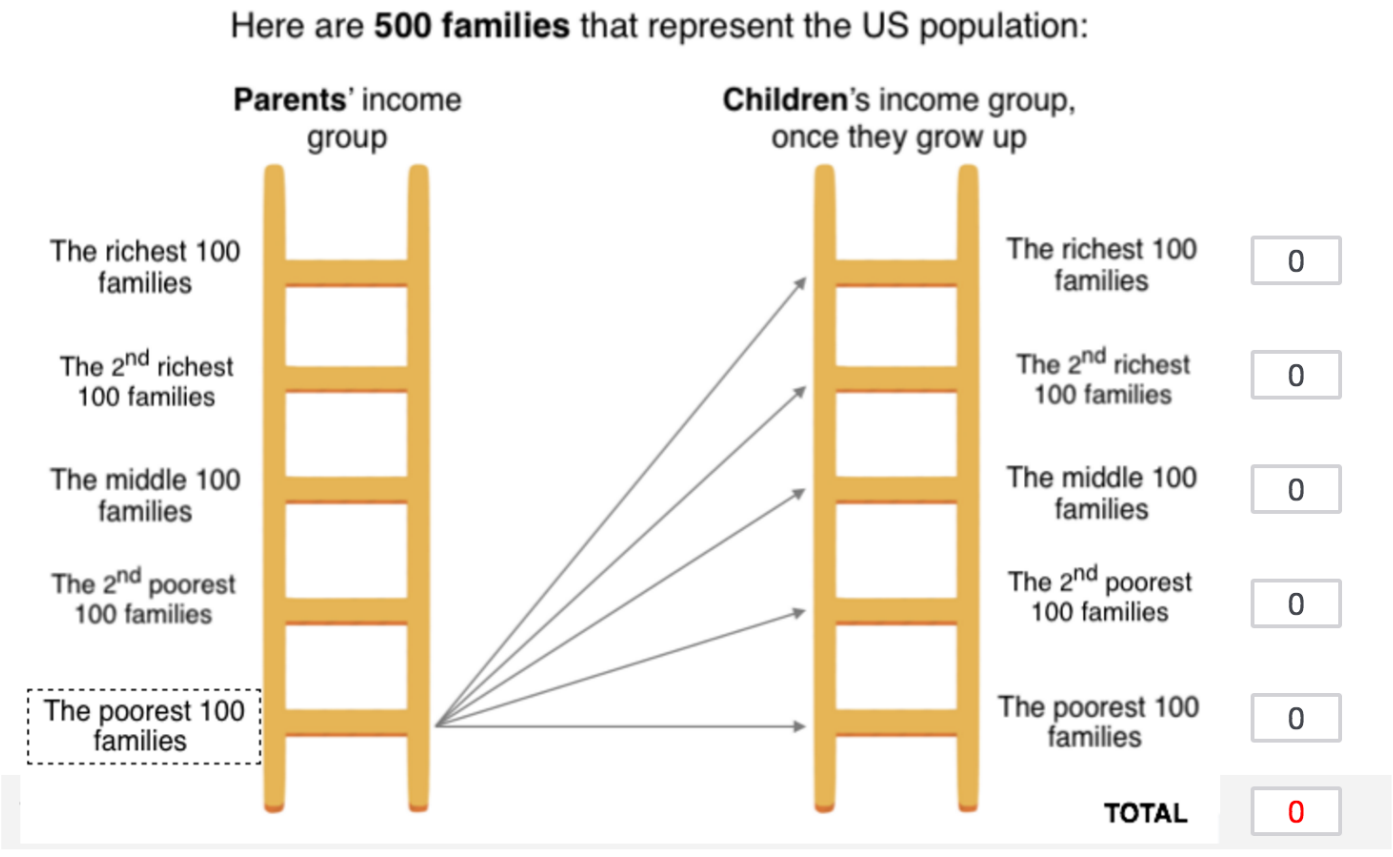
- Probability that a child born to parents in the bottom fifth of the income distribution reaches the top fifth:



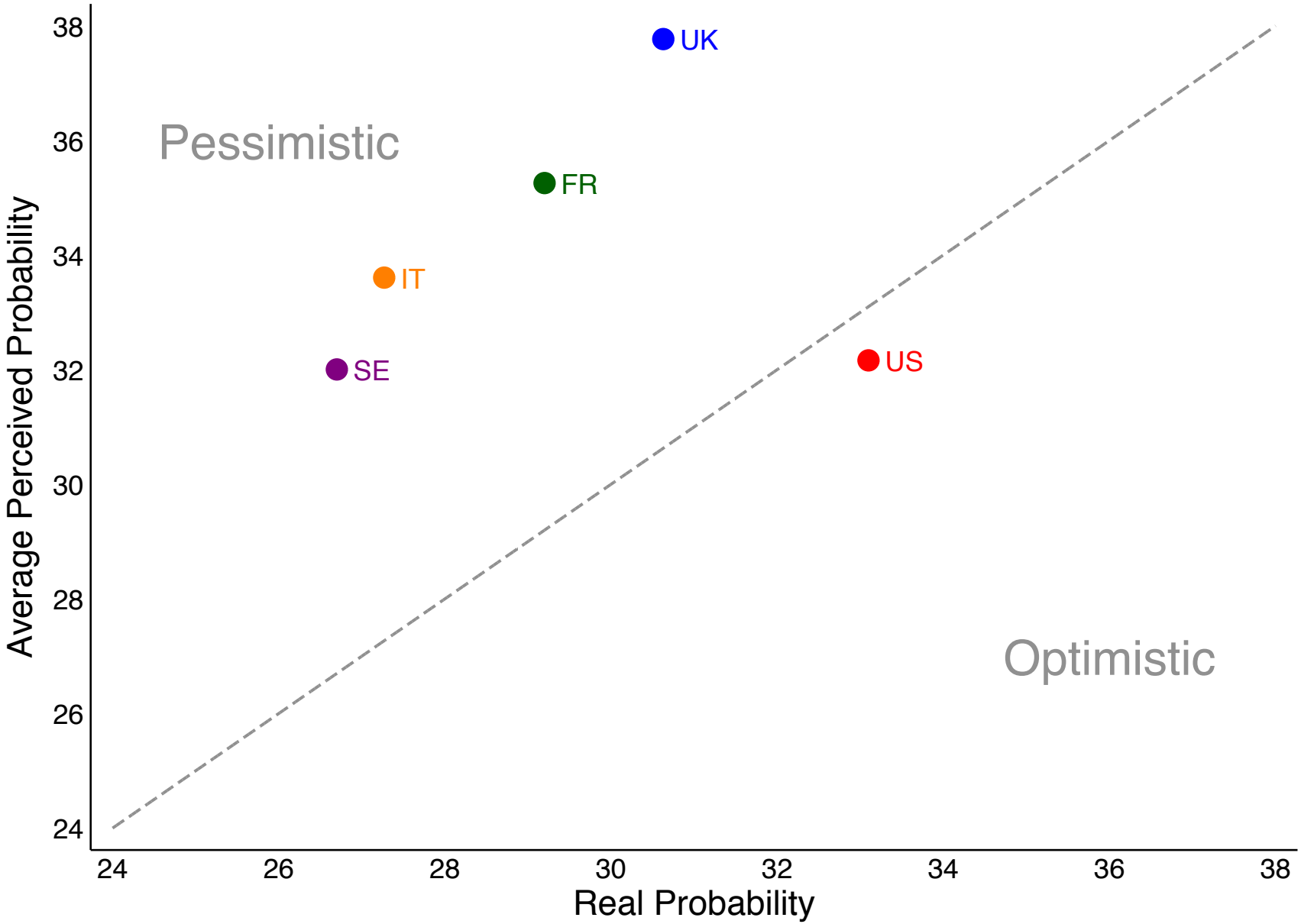

→ Chances of achieving the “American Dream” are almost two times higher in Canada than in the U.S.

# What do People Know about Actual Social Mobility? (Alesina, Stantcheva, and Teso (2018)

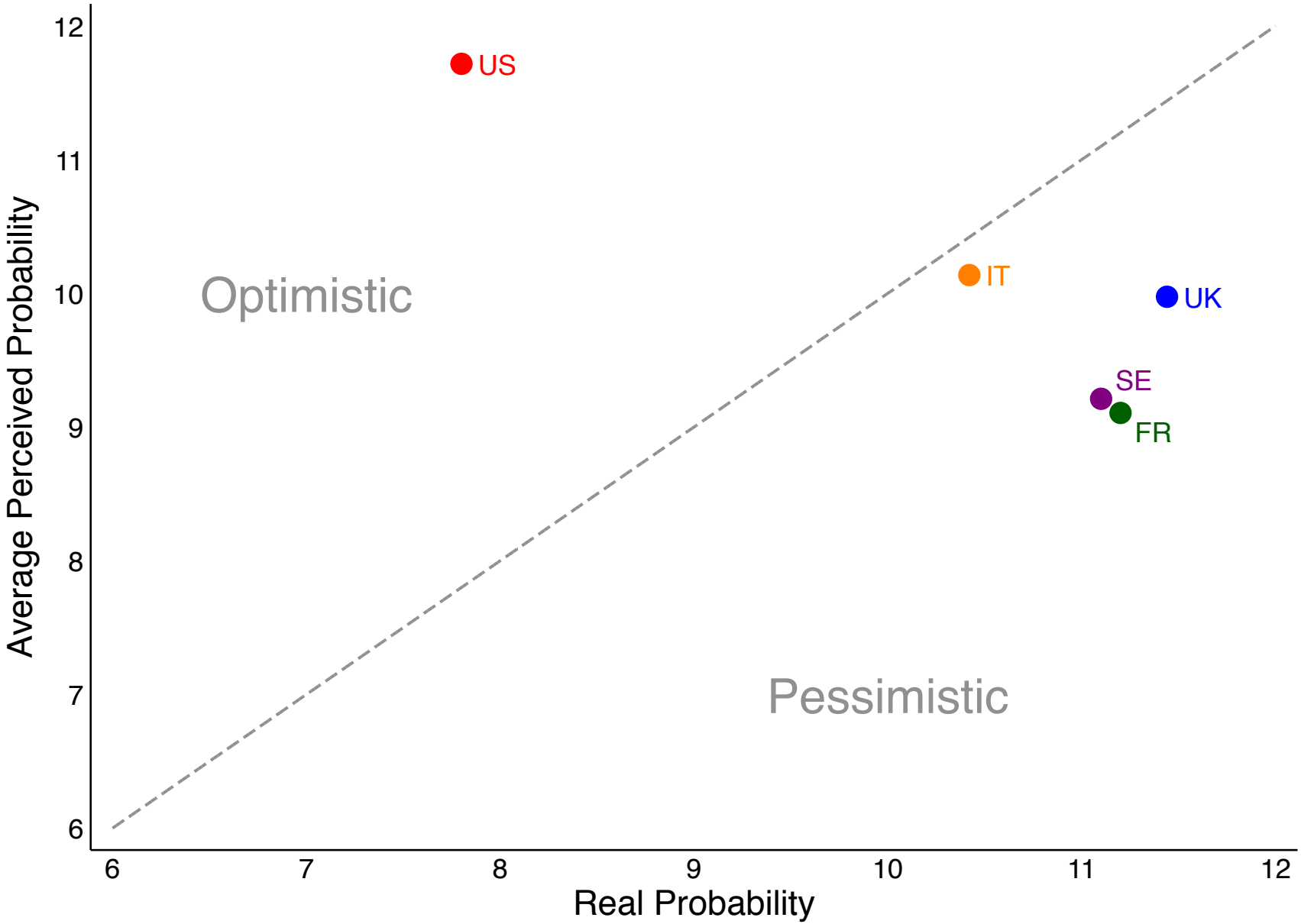
## Eliciting respondent's beliefs on upward mobility



# Probability of Staying in Bottom Quintile (Actual vs. Perceived)



# Probability of Moving to Top Quintile (Actual vs. Perceived)

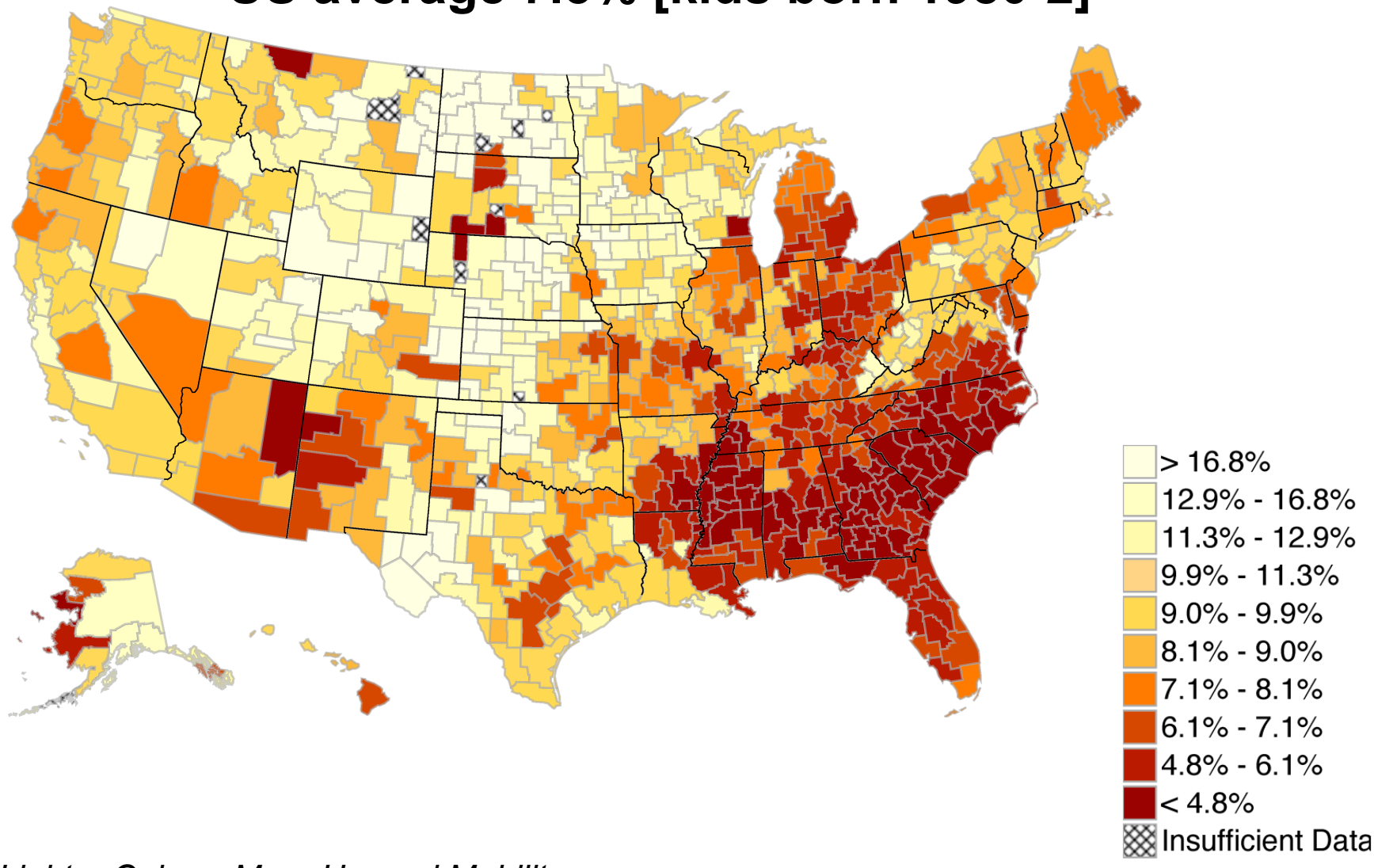


Source: Chetty et al. (2014)

# The Geography of Upward Mobility in the United States

## Probability of Reaching the Top Fifth Starting from the Bottom Fifth

## US average 7.5% [kids born 1980-2]




*Note: Lighter Color = More Upward Mobility*

*Download Statistics for Your Area at www.equality-of-opportunity.org*

Source: Chetty et al. (2014)

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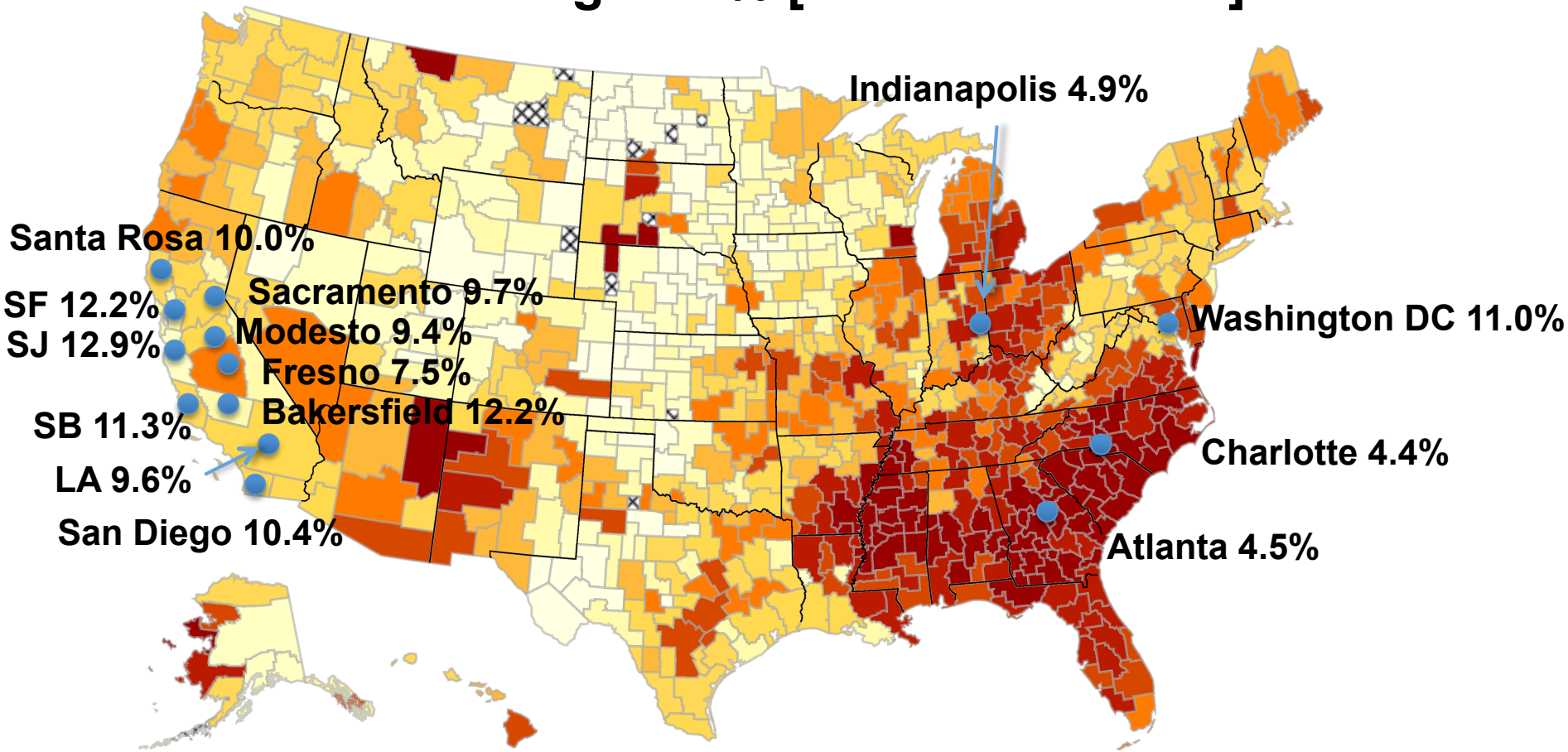



*Note: Lighter Color = More Upward Mobility*

*Download Statistics for Your Area at www.equality-of-opportunity.org*

TABLE 1. Upward Mobility in the 50 Largest Metro Areas: The Top 10 and Bottom 10

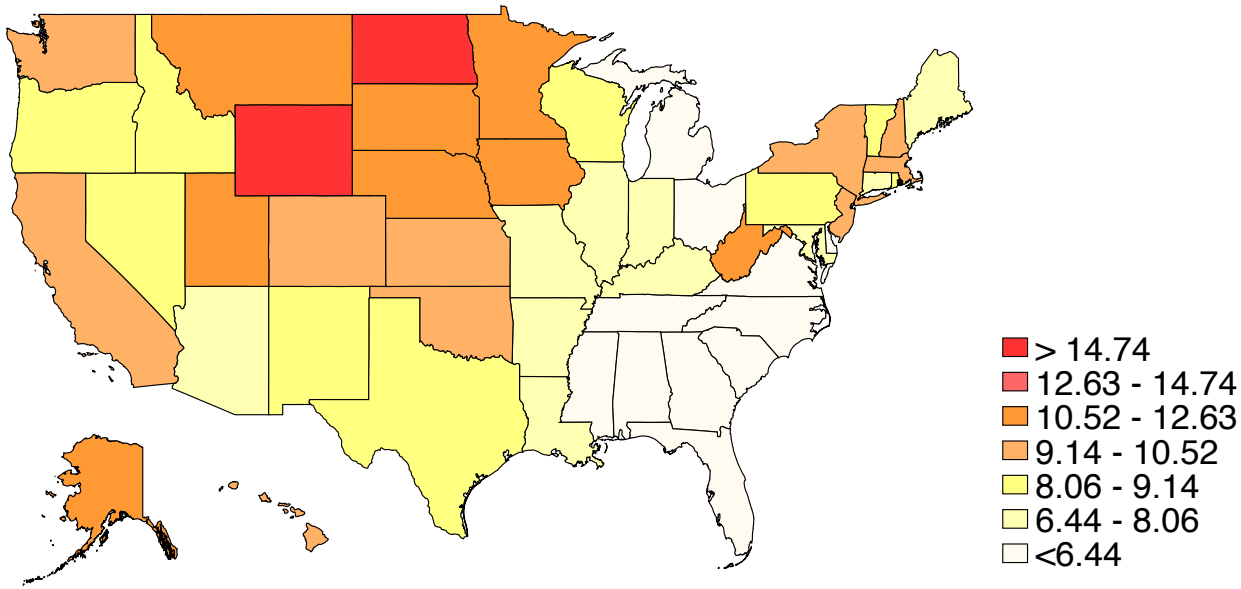
| Rank | Commuting Zone | Odds of Reaching Top Fifth from Bottom Fifth | Rank | Commuting Zone | Odds of Reaching Top Fifth from Bottom Fifth |
|---|---|---|---|---|---|
| 1 | San Jose, CA | 12.9% | 41 | Cleveland, OH | 5.1% |
| 2 | San Francisco, CA | 12.2% | 42 | St. Louis, MO | 5.1% |
| 3 | Washington, D.C. | 11.0% | 43 | Raleigh, NC | 5.0% |
| 4 | Seattle, WA | 10.9% | 44 | Jacksonville, FL | 4.9% |
| 5 | Salt Lake City, UT | 10.8% | 45 | Columbus, OH | 4.9% |
| 6 | New York, NY | 10.5% | 46 | Indianapolis, IN | 4.9% |
| 7 | Boston, MA | 10.5% | 47 | Dayton, OH | 4.9% |
| 8 | San Diego, CA | 10.4% | 48 | Atlanta, GA | 4.5% |
| 9 | Newark, NJ | 10.2% | 49 | Milwaukee, WI | 4.5% |
| 10 | Manchester, NH | 10.0% | 50 | Charlotte, NC | 4.4% |

Note: This table reports selected statistics from a sample of the 50 largest commuting zones (CZs) according to their populations in the 2000 Census. The columns report the percentage of children whose family income is in the top quintile of the national distribution of child family income conditional on having parent family income in the bottom quintile of the parental national income distribution—these probabilities are taken from Online Data Table VI of Chetty et al., 2014a.

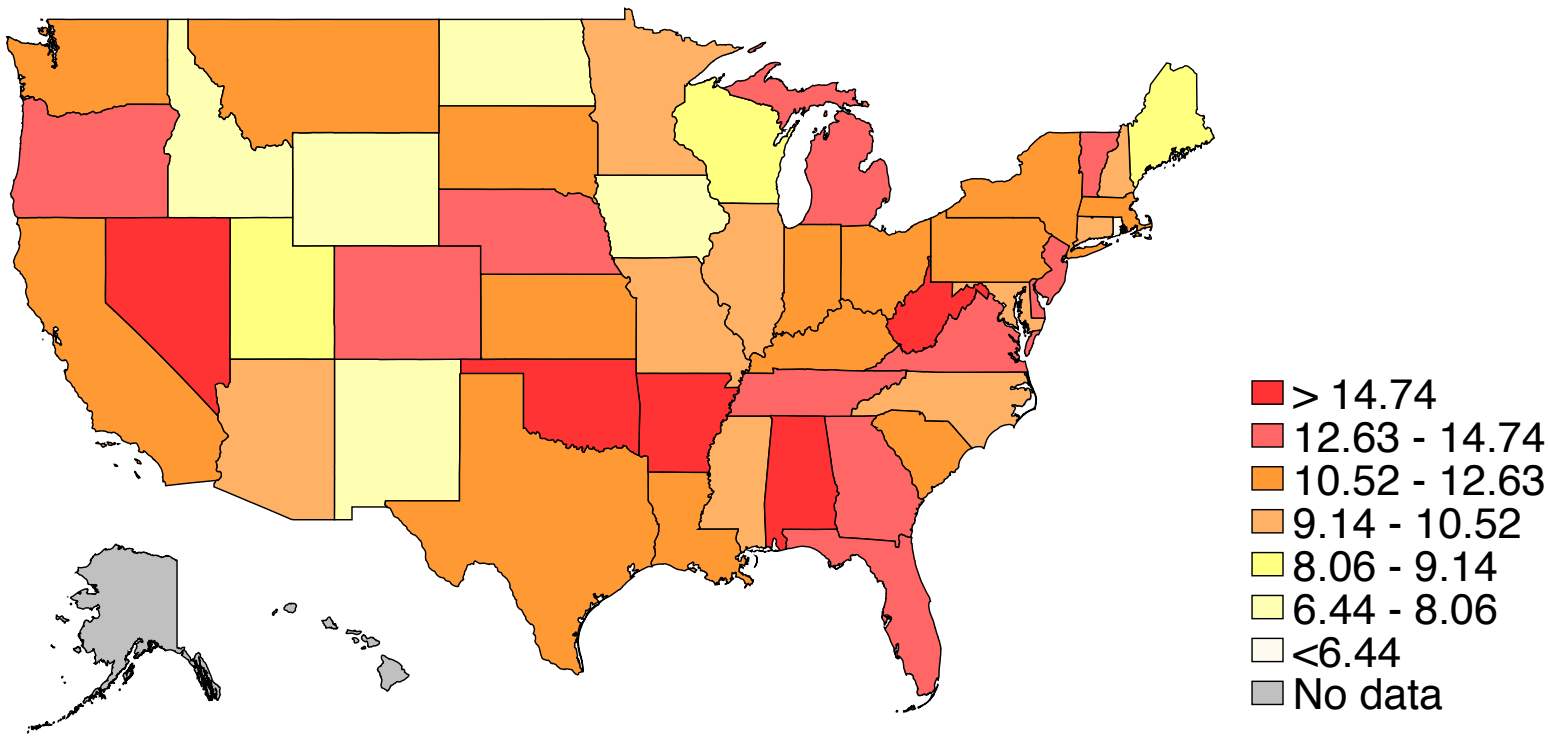
Source: Chetty et al., 2014a.

# How do Perceptions and Reality Vary across the US?

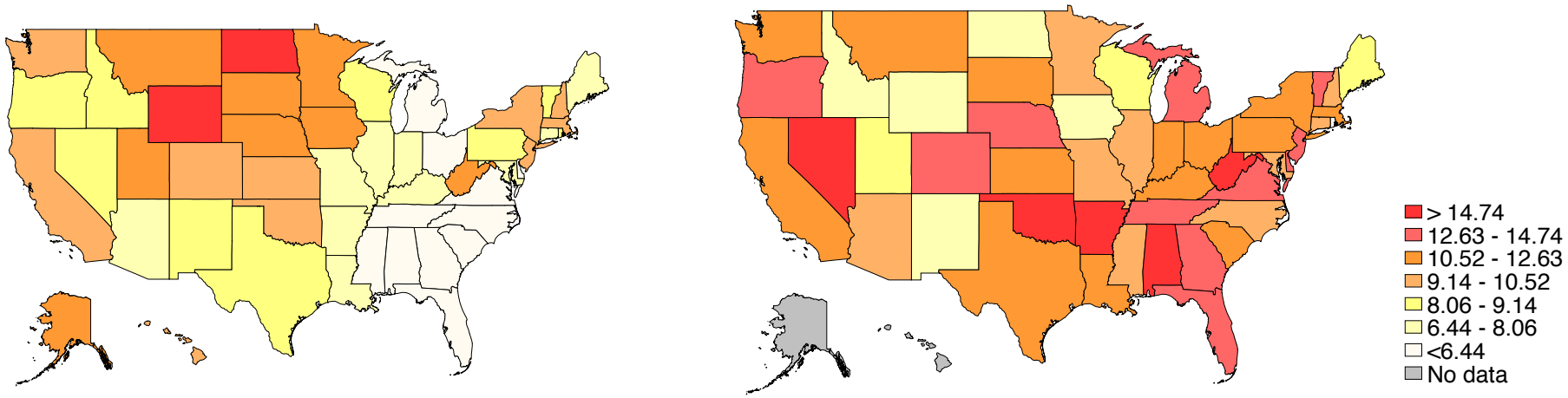
## Actual probability of moving from bottom to top quintile



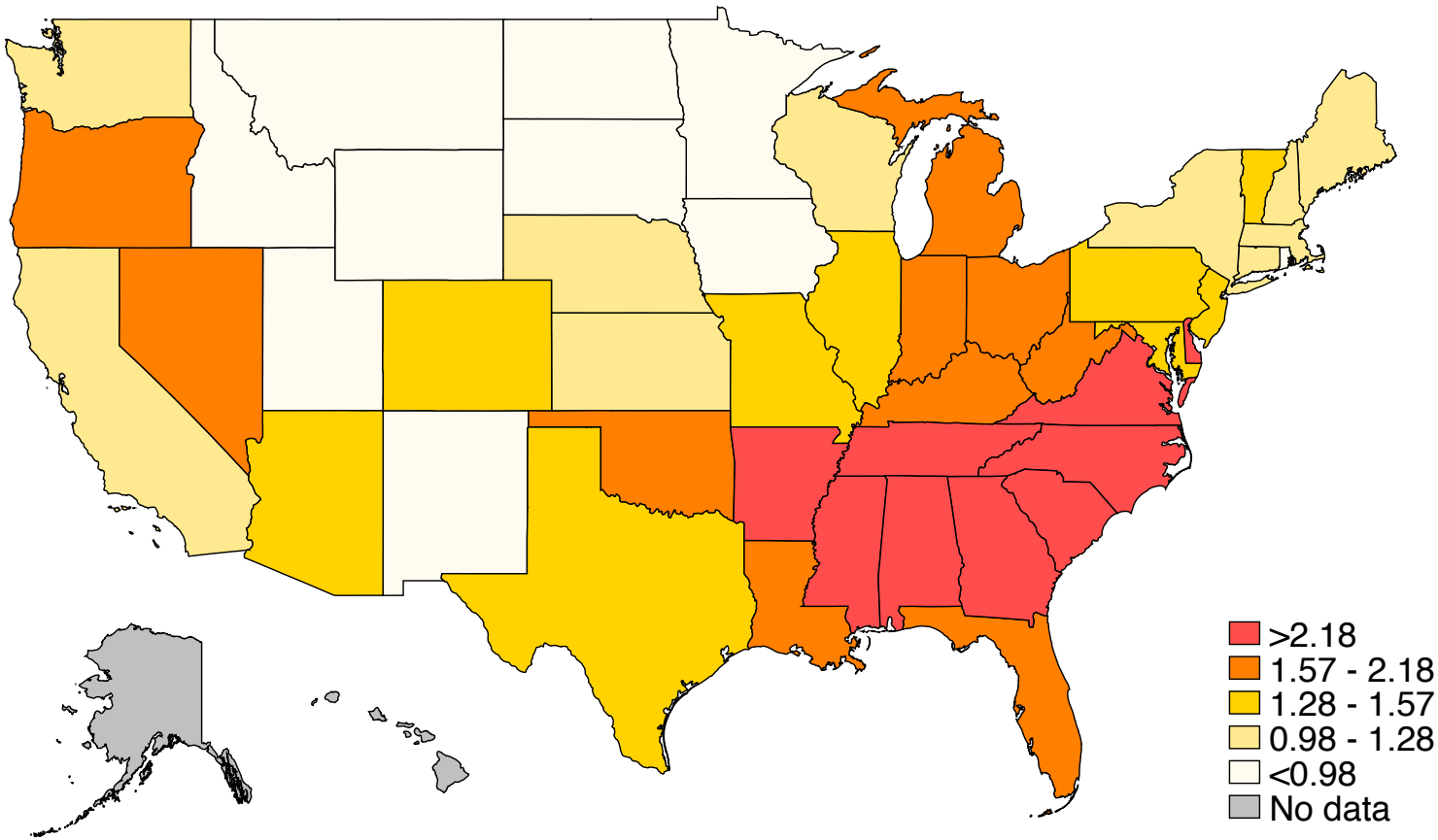
# Perceived probability of moving from bottom to top



# Actual and perceived probability of moving from bottom to top quintile



# Ratio of actual local and perceived probability of moving from bottom to top




What are local perceptions correlated with, controlling for individual-level characteristics? ▸ National

## Govt Redistribution with Taxes and Transfers

Government 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

a) If $y = z \cdot (1 - t)$ with constant $t$, tax/transfer system is neutral

b) If $y = z \cdot (1 - t) + G$ where $G$ is a universal (lumpsum) allowance, then tax/transfer system is progressive

c) If $y = z - T$ where $T$ is a uniform tax (poll tax), then tax/transfer system is regressive

Current tax/transfer systems in rich countries look roughly like b)

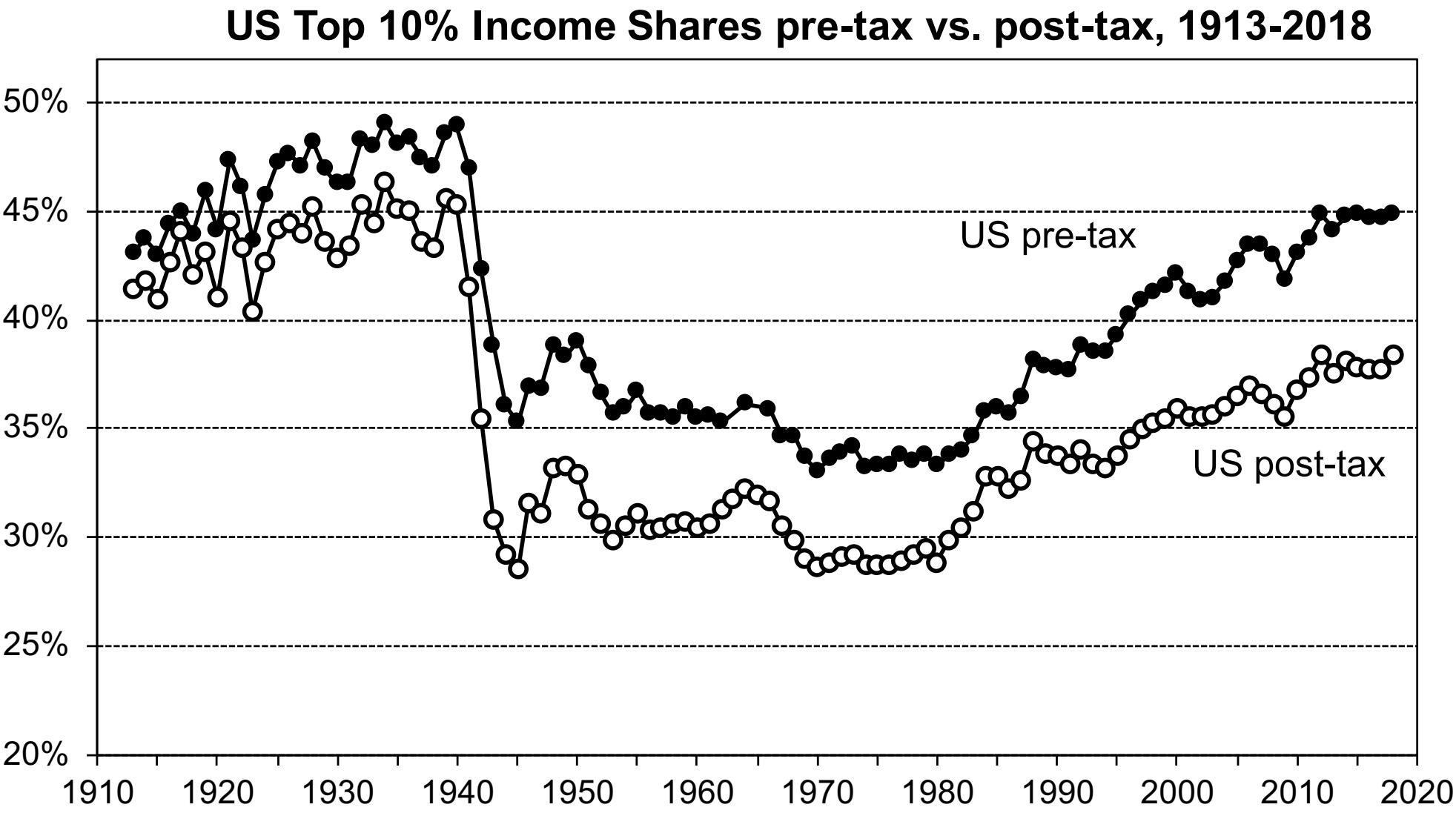
## US Distributional National Accounts

Piketty-Saez-Zucman NBER'16 distribute both pre-tax and post-tax US national income across adult individuals

Pre-tax income is income before taxes and transfers

Post-tax income is income net of all taxes and adding all transfers and public good spending

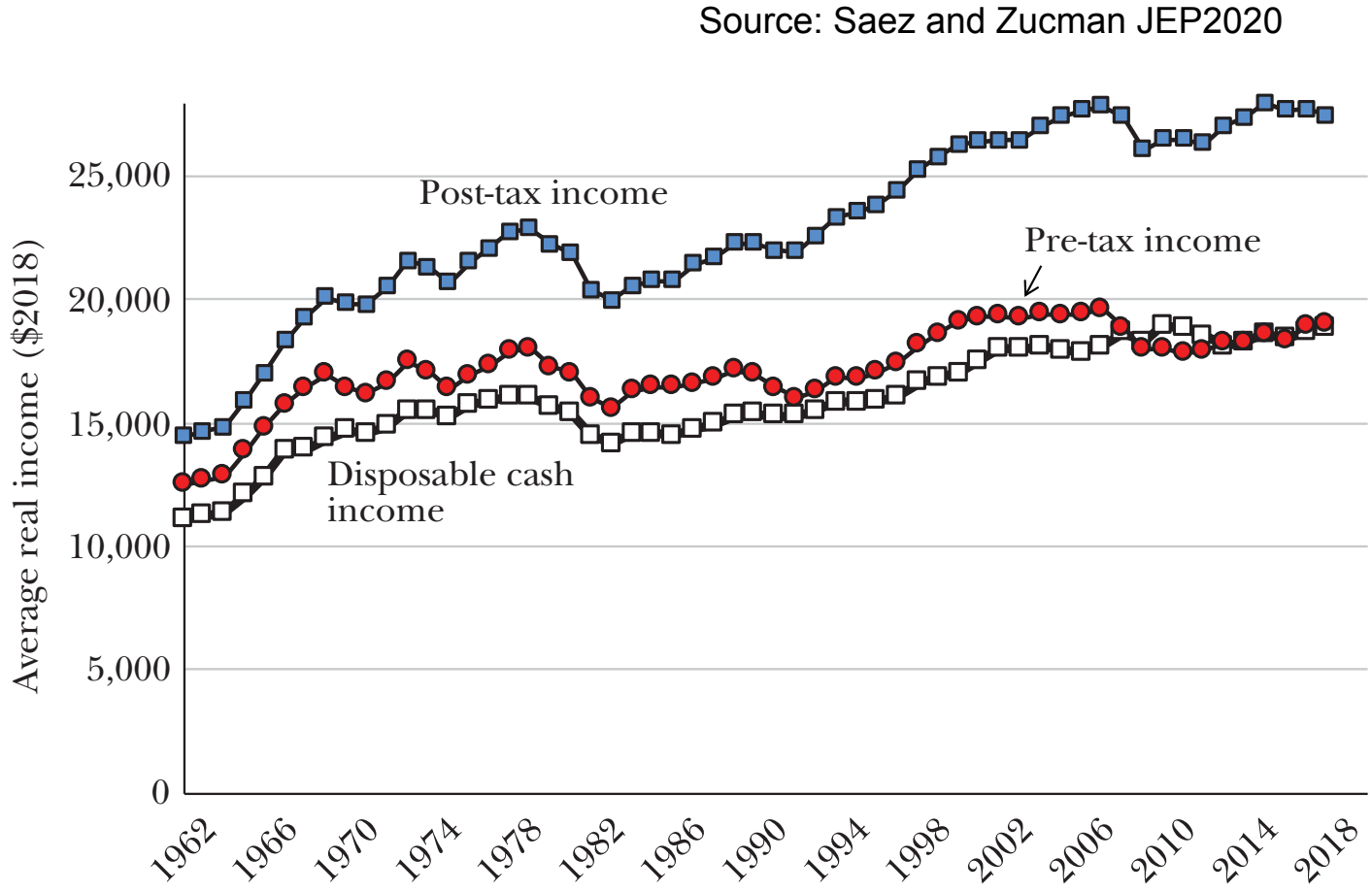
Both concepts add up to national income and provide a comprehensive view of the mechanical impact of government redistribution




Top income shares of pretax and posttax national income among adults (income within married couples equally split). Source is Piketty, Saez, Zucman (2018) for US and Piketty et al. (2020) for France.

*Figure 6*

**The Evolution of Bottom 50 Percent Incomes**




*Source:* Piketty, Saez, and Zucman (2018), updated September 2020.

*Note:* The figure depicts the evolution of the real incomes per adult (in 2018 dollars) for the bottom half of the income distribution for three income concepts: (1) pre-tax income before deducting taxes or adding government transfers (concept sums up to national income), (2) post-tax income that deducts all taxes and adds all transfers (cash and in-kind) and collective public expenditures minus the government deficit (also sums up to national income), (3) disposable cash income which is pre-tax income minus all taxes plus cash (or quasi-cash) transfers, i.e., (3) does not include in-kind transfers (primarily Medicaid and Medicare) and collective public expenditures that are included in (2).

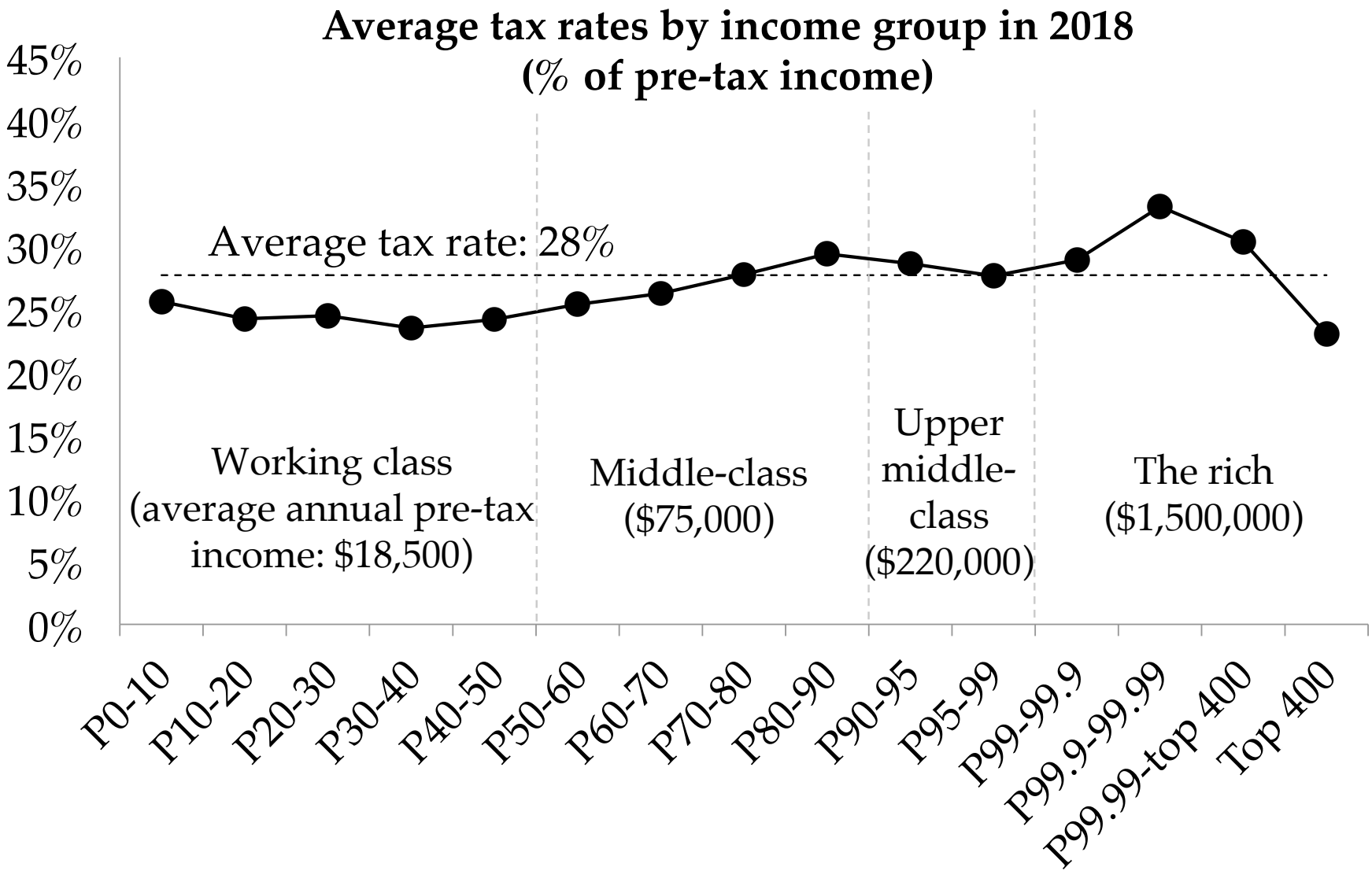
## US tax/transfer System: Progressivity and Evolution

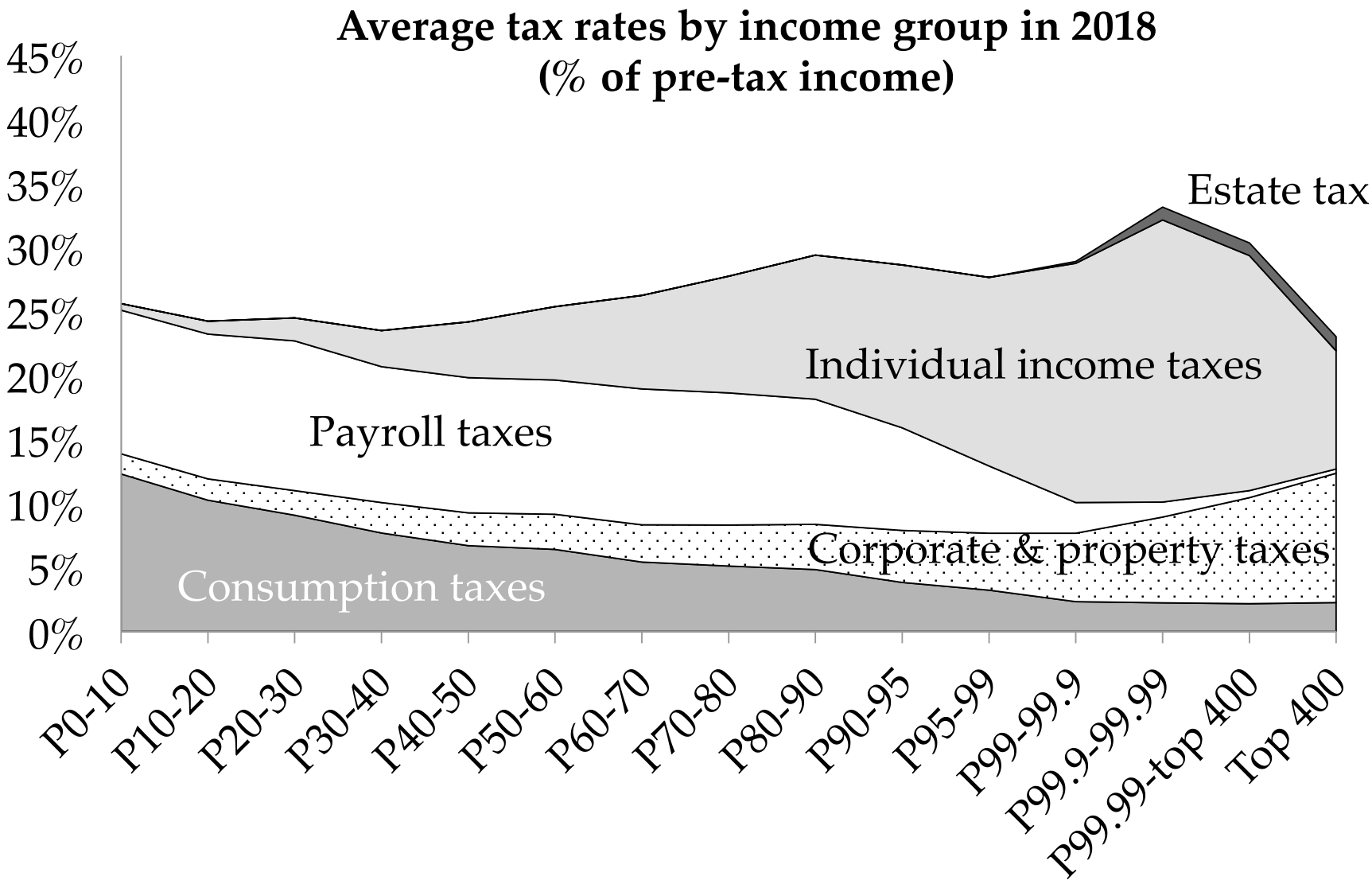
**0) US Tax/Transfer system is progressive overall:** pre-tax national income is less equally distributed than post-tax/post-transfer national income

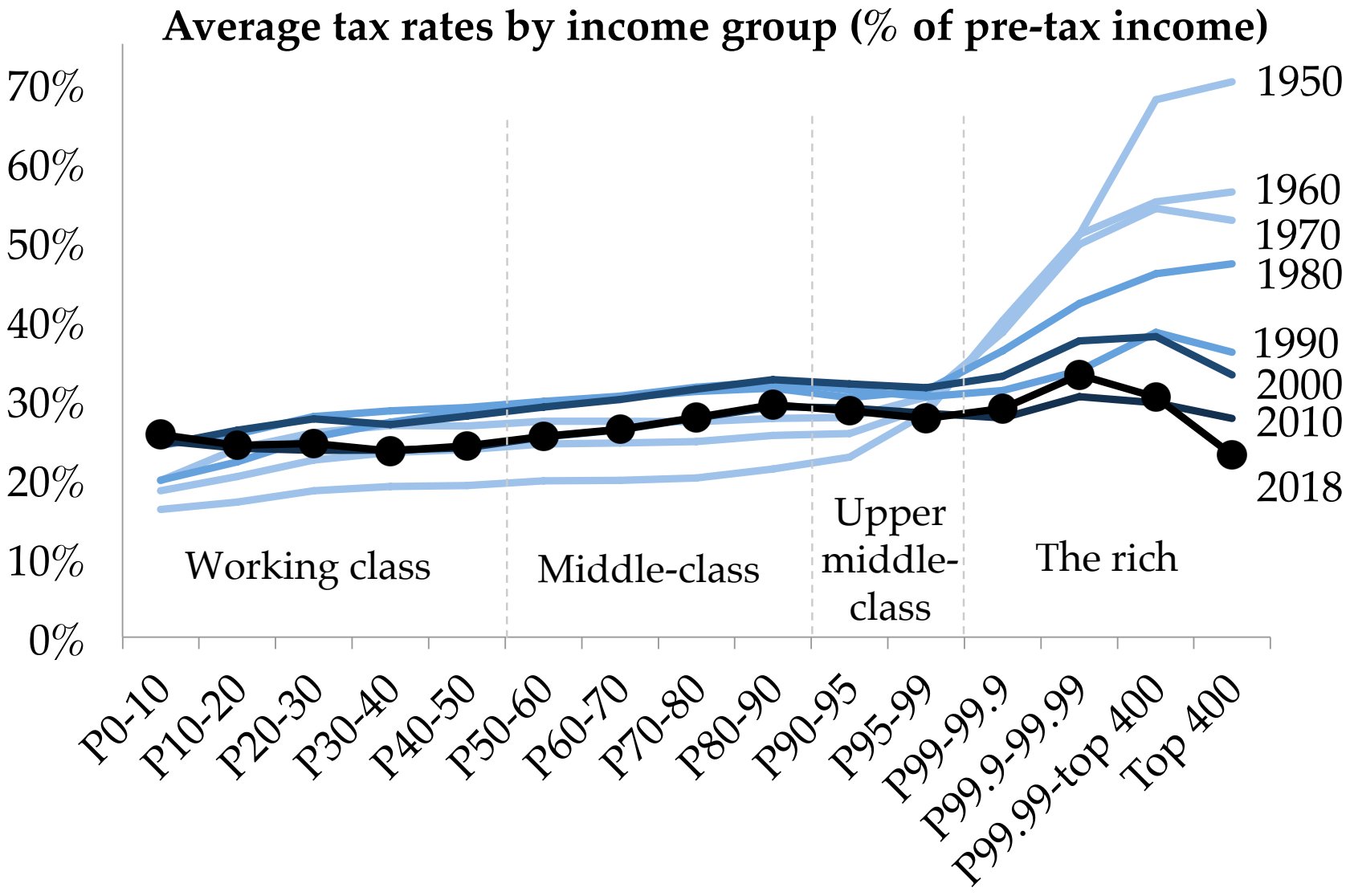
**1) Medium Term Changes:** Federal Tax Progressivity has declined since 1970 but govt redistribution through transfers has increased (Medicaid, Social Security retirement, DI, UI various income support programs)

**2) Long Term Changes:** Before 1913, US taxes were primarily tariffs, excises, and real estate property taxes [slightly regressive], minimal welfare state (and hence small govt)

http://www.treasury.gov/education/fact-sheets/taxes/ustax.shtml


Average tax rates by income group in 2018
(% of pre-tax income)
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Average tax rate: 28%
Working class
(average annual pre-tax
income: $18,500)
Middle-class
($75,000)
Upper
middle-
class
($220,000)
The rich
($1,500,000)
P0-10
P10-20
P20-30
P30-40
P40-50
P50-60
P60-70
P70-80
P80-90
P90-95
P95-99
P99-99.9
P99.9-99.99
P99.99-top 400
Top 400


Average tax rates by income group in 2018
(% of pre-tax income)
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Estate tax
Individual income taxes
Payroll taxes
Corporate & property taxes
Consumption taxes
P0-10
P10-20
P20-30
P30-40
P40-50
P50-60
P60-70
P70-80
P80-90
P90-95
P95-99
P99-99.9
P99.9-99.99
P99.99-top 400
Top 400


Average tax rates by income group (% of pre-tax income)
70%
60%
50%
40%
30%
20%
10%
0%
1950
1960
1970
1980
1990
2000
2010
2018
Working class
Middle-class
Upper middle-class
The rich
P0-10
P10-20
P20-30
P30-40
P40-50
P50-60
P60-70
P70-80
P80-90
P90-95
P95-99
P99-99.9
P99.9-99.99
P99.99-top 400
Top 400

## Federal US Tax System (2/3 of total taxes)

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] (1% of revenue)

5) Minor excise taxes (on consumption) [regressive] (3% of revenue)

Fed agencies (CBO, Treasury, Joint Committee on Taxation) and think-tanks (Tax Policy Center) provide distributional Fed tax tables

## State+Local Tax System (1/3 of total taxes)

Decentralized governments can experiment, be tailored to local views, create tax competition and make redistribution harder (famous Tiebout 1956 model) hence favored by conservatives

1) Individual + Corporate income taxes [progressive] (1/3 of state+local tax revenue)

2) Sales taxes + Excise taxes (tax on consumption) [regressive] (1/3 of revenue)

3) Real estate property taxes (on capital income) [slightly progressive] (1/3 of revenue)

See ITEP (2018) "Who Pays" for systematic state level distributional tax tables

US Census provides Census of Government data

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