Econ 230B – Graduate Public Economics

The structure of inequality, taxes, and transfers

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Roadmap

1. Distributional issues in economics
2. Inequality in the long-run: labor vs. capital
3. Measuring inequality: current issues
4. The effect of taxes and transfers on inequality

1 Distributional issues in economics

Economics in the 1950s-1980s: almost entirely about efficiency

- Inequality at historically low level
- Cold-war context $\rightarrow$ key question: are market economies better than planned economies at allocating resources?
- Lots of progress made: fundamental theorems of welfare economics; market failues; government failures, etc.

Economics in the 19th, 20th, and 21st century: inequality at the center stage

- Key question: do market economies tend to generate unsustainable inequality?
- What are the forces that push toward equality? Inequality?
- Less progress made than on the efficiency front: lack of good data; limited heterogeneity in workhorse models; identification challenges
- The following brief history of distributional issues in economic thought adapted from Piketty (2014, chapter 1)

Thomas Malthus

- *Essay on the Principle of Population*, 1798
- Model: population grows $\rightarrow$ labor supply increases $\rightarrow$ wages fall to subsistence levels ("iron law of wages")
- Prediction: misery for the masses, revolution
- Policy recommendation: limit population growth
- Problem: did not anticipate modern economic growth

Figure 6. Population and real wages: England, 1250–1750. Sources: Clark (2001, 2002).

David Ricardo

- *Principles of Political Economy and Taxation*, 1817
- Model: fixed land supply, rising population $\rightarrow$ land rents and prices bound to rise ("scarcity principle")
- Prediction: land-owners will capture an ever growing fraction of national income
- Policy recommendation: tax land, open up to foreign agricultural products ($\rightarrow$ repeal of the corn laws, 1846)
- Problem: did not anticipate improvement in agric. productivity

Karl Marx

- *Das Kapital* vol. 1, 1867
- Model: convex saving rate ("Accumulate, accumulate, it's Moses and the prophets")
- Prediction #1: Ever growing share of income captured by capitalists $\rightarrow$ workers' revolution
- Prediction #2: Fall in rate of return to capital $\rightarrow$ infighting among capitalists (Lenin, *Imperialism, the Highest Stage of Capitalism*)
- Policy recommendation: communism

Marx and factor shares with CES production

- Under which condition would Marx's prediction #1 realize?

- Consider a CES production function:

$$F(K,L) = (a \cdot K^{\frac{\sigma-1}{\sigma}} + (1-a) \cdot L^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}}$$

- $\sigma =$ elasticity of substitution. Captures the response of the capital-labor ratio K/L to a change in relative factor prices v/r:

$$\sigma = -\frac{\mathrm{d}log(K/L)}{\mathrm{d}log(F_K/F_L)} = \frac{\mathrm{d}log(K/L)}{\mathrm{d}log(v/r)}$$

- As $\sigma \to \infty$, the production function becomes linear: $Y = rK + vL$. Robot economy

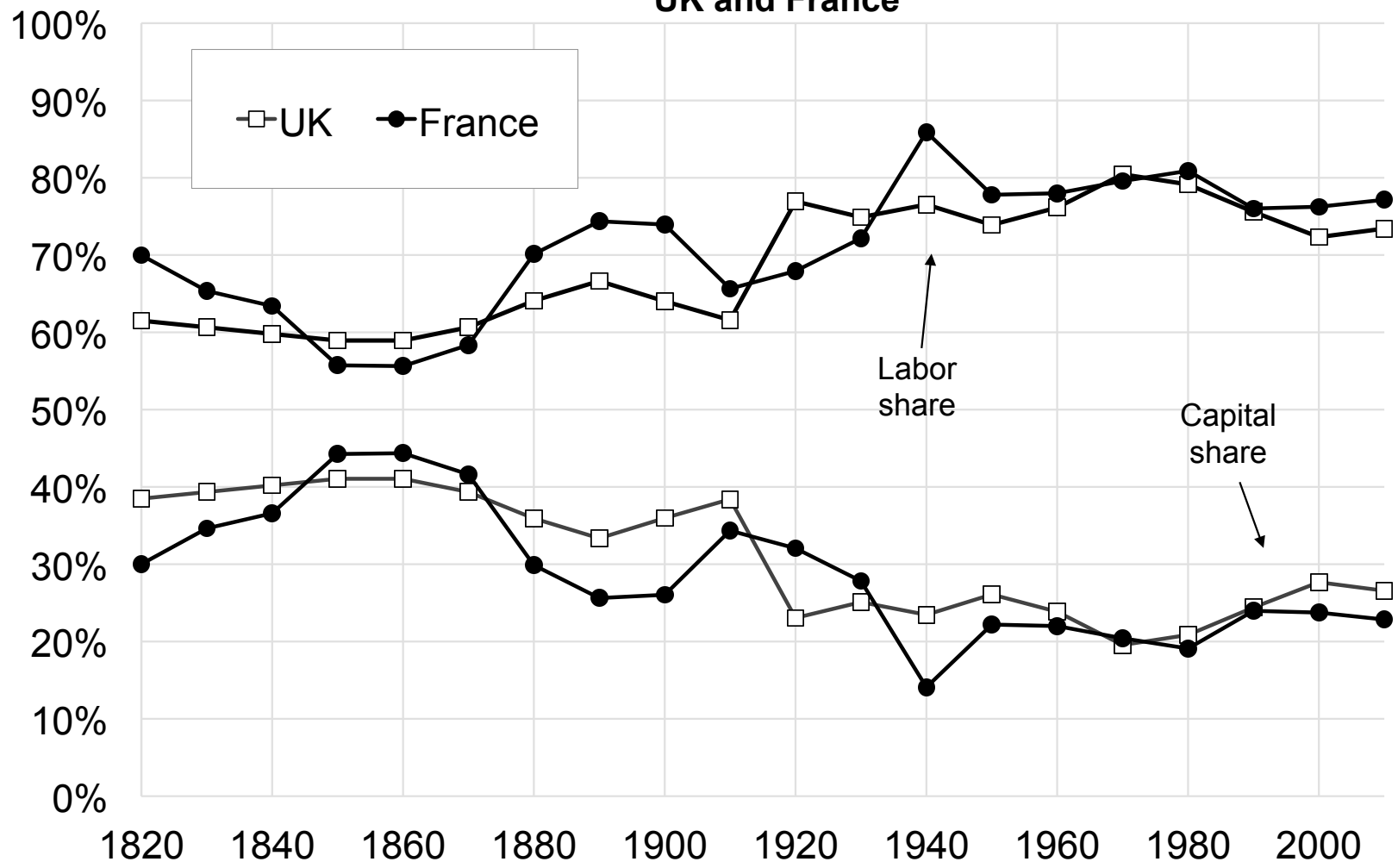
- As $\sigma \to 0$, the production function becomes putty-clay, i.e. $F(K, L) = min(rK, vL)$: no substitution possibility

- As $\sigma \to 1$, production becomes Cobb-Douglas

- Capital share is a rising function of K/Y if and only if $\sigma > 1$

- If $\sigma < 1$, capital share *falls* when capital grows faster than income (contra Marx's prediction #1). Whatever σ, r falls.

Figure 15: Factor shares in factor-price national income 1820-2010: UK and France



Source: Piketty and Zucman (2014)

Simon Kuznets

- *Shares of Upper Income Groups in Income & Saving* 1953
- First large-scale scientific use of data to study inequality and growth, using national accounts and tax returns
- Model: two-sector model of the transition from agriculture to industry
- Prediction: inequality follows an $\cap$ over path of development
- Problem: Over-estimated equalizing power of growth

- Classical economists: under-estimated equalizing power of growth; Kuznets: over-estimated it

- Today we can ask the same questions they did, but with more & better data and theories:

  – International and historical data on income and wealth

  – Rigorous models of inequality

  – Modern evaluation tools to assess effect of policies

2 Inequality in the long-run: labor vs. capital

There are two sources of income: labor and capital

- Aggregate income $Y = F(K, L) = Y_L + Y_K$
- Individual factor income $y_i = y_{Li} + y_{Ki}$

Income inequality depends on:

- Distribution of $y_L \rightarrow$ race between education and technology, unions, minimum wage, labor taxation (esp. at the top)...

- Distribution of $y_K \rightarrow$ inheritance, saving rates, rates of return, capital controls, capital taxation, ...

- Factor shares $\alpha = Y_K/Y$ and $1-\alpha \rightarrow$ technology, bargaining power, competition policy, globalization...

- Joint distribution of labor and capital income

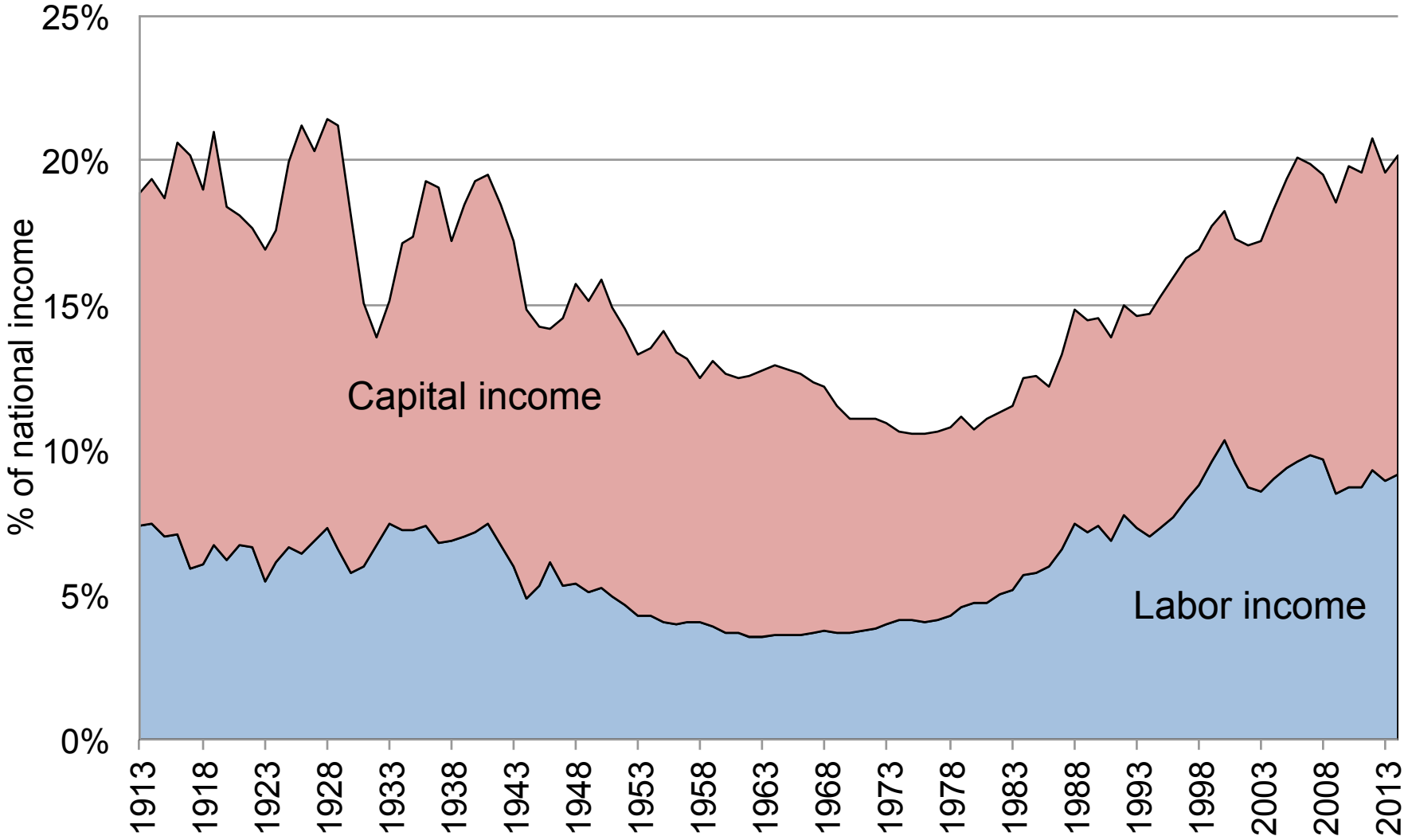
- By Sklar's theorem, joint distribution of labor and capital income can be expressed as product of the marginals times the copula (= the joint distribution of percentile ranks)

$$h(y_L, y_K) = f(y_L) \cdot g(y_K) \cdot c(F(y_L), G(y_K))$$

Several ways in which income inequality can be high:

- "Supermanagers society": high inequality of labor income = US in 1990s
- "Rentier society": high ineq. of wealth, inherited = Europe in 1913
- "Robber baron society": high inequality of wealth, self-made = US in 1913
- Combination of the above: increasingly so the US today (see Lakner and Atkinson, 2015, on changes in US copula over time)

Top 1% pre-tax income share: labor vs. capital income



Source: Piketty, Saez and Zucman (2016)

Inequality in the long-run

Since the early 2000s, many studies estimating top income shares in the long-run (e.g., Piketty and Saez (2003) for the US; see Atkinson, Piketty & Saez (2011) for a survey)

- Following up on Kuznets (1953), with more years and countries
- Combine tax data, Pareto-interpolation techniques, and national accounts to estimate shares of income going to top groups
- Data available in the World Wealth & Income Database: `http://WID.world`

Two main lessons from top income share studies:

Lesson 1: in the long-run, biggest changes in income inequality come from the capital side

- Dramatic variation over time in capital concentration (top 1% wealth share as high as 60% in 1910 UK $\rightarrow$ 15% in 1980s)

- Less variation in labor income inequality (big exception = US)

Lesson 2: diversity of national histories in recent decades

- Shows key role of domestic policies

Two main limits of top income share studies:

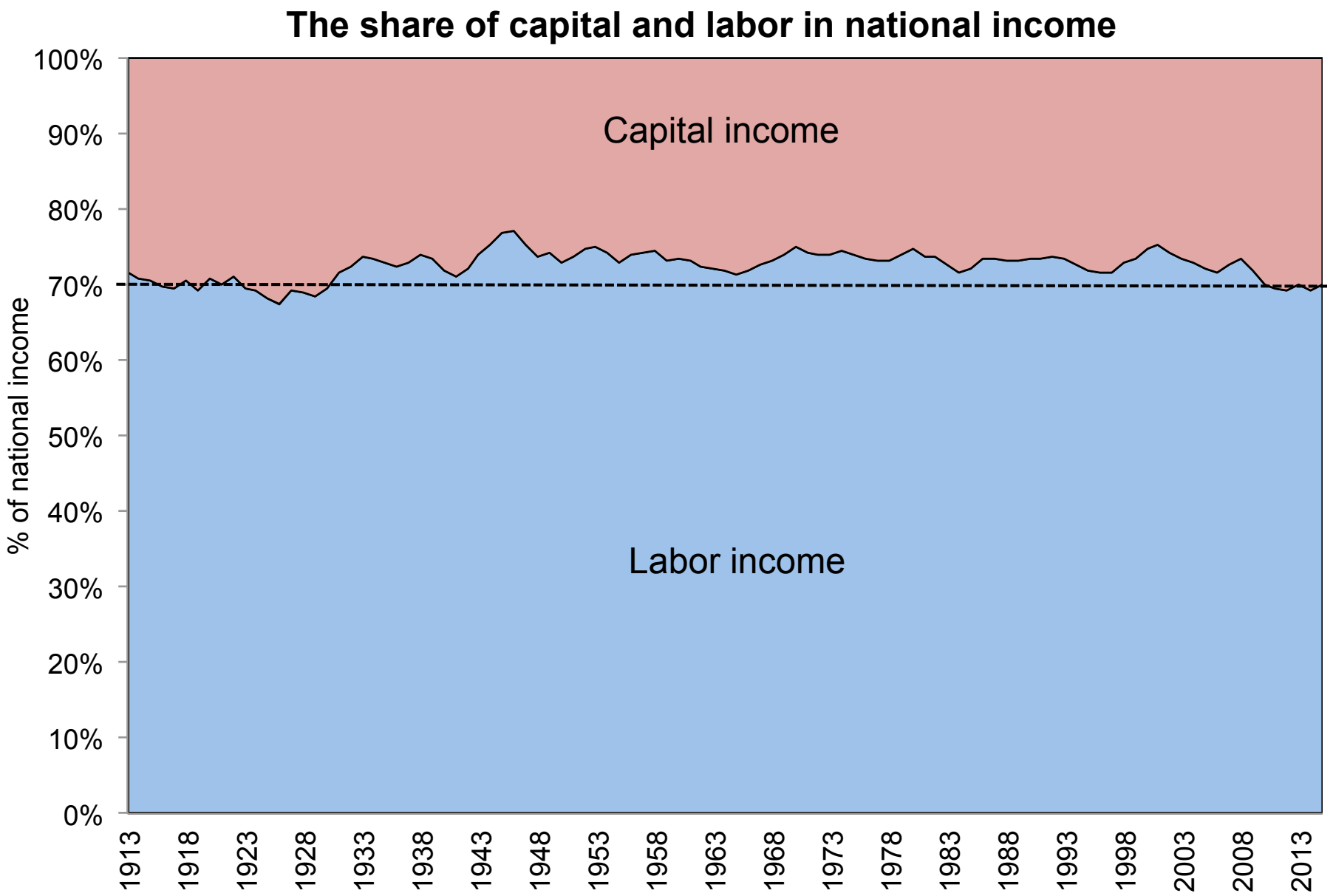
Limit 1: tax data miss a large and growing fraction of income $\rightarrow$ large disconnect between inequality and macro

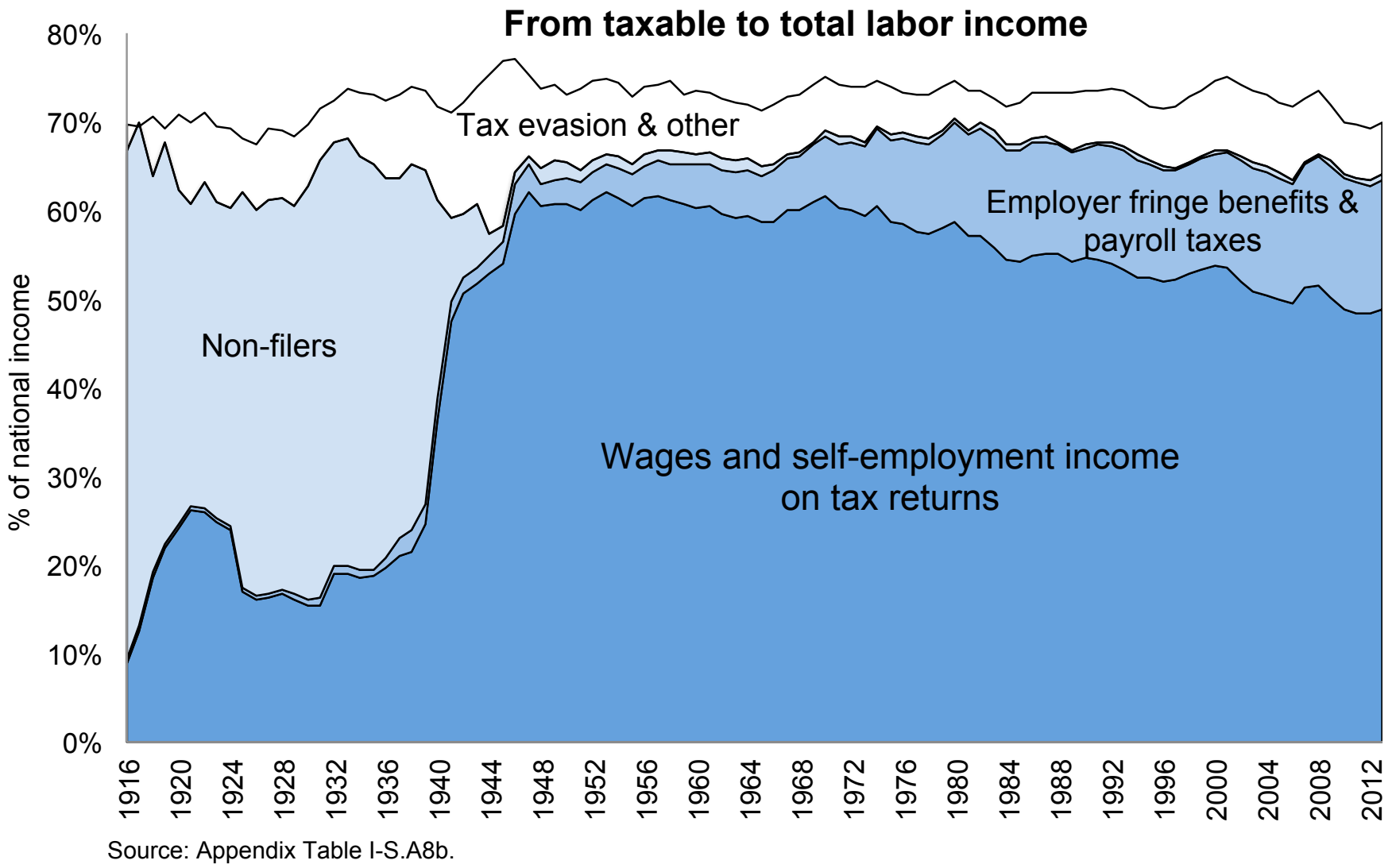
- In all countries, miss most capital income (tax exempt; tax evasion); sometimes miss some labor income too

- Implies substantial uncertainty on level and trend of inequality

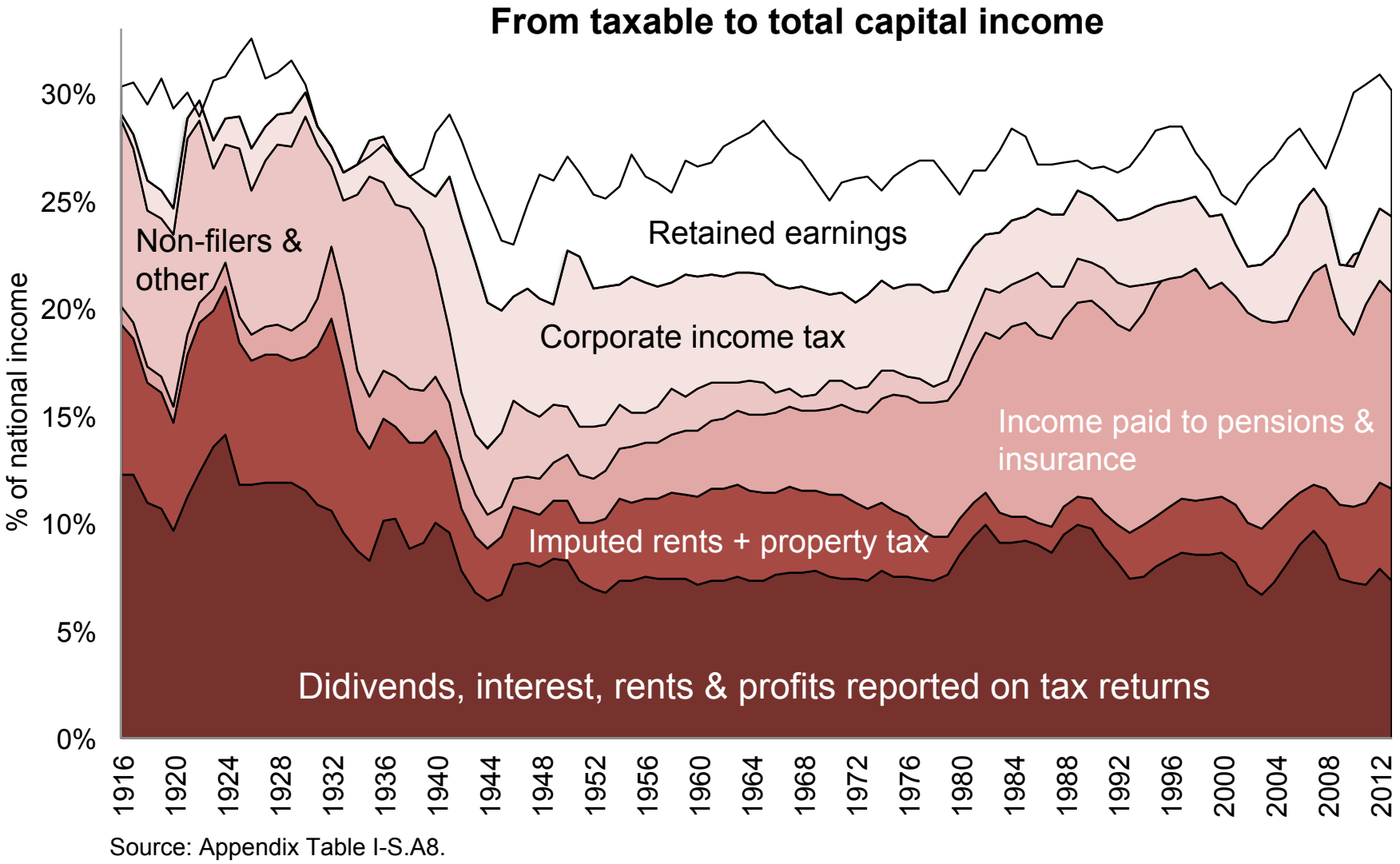
Limit 2: silent about distribution of after-tax-and-transfer income

$\rightarrow$ Current research frontier = bridging inequality/macro gap; measurement of capital inequality; impact of taxes and transfers


The share of capital and labor in national income
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% of national income
Capital income
Labor income
1913
1918
1923
1928
1933
1938
1943
1948
1953
1958
1963
1968
1973
1978
1983
1988
1993
1998
2003
2008
2013



Source: Piketty, Saez and Zucman (2016)



Source: Piketty, Saez and Zucman (2016)

3 Measuring inequality: current issues

Key problem in the study of inequality: lack of data on capital side (which is key in the long run)

- No wealth tax in most countries
- Survey data generally fail to capture wealthy individuals
- Literature uses indirect method; none is perfect:
  - Estate multiplier method
  - Income capitalization method

Estate multiplier method

- Start with wealth-at-death reported on estate (or inheritance) tax returns
- Compute mortality rate by age and gender
- Then weight wealth-at-death by inverse of mortality rate
- Popular because of availability of estate tax data: Mallet (1908), Seailles (1910), Strutt (1910), Stamp (1919), Lampman (1962), Atkinson and Harrison (1978), Piketty, Postel-Vinay, Rosenthal (2004), Kopczuk and Saez (2004); Garbinti, Goupille, Piketty (2017): Alvaredo, Atkinson, Morelli (2017)

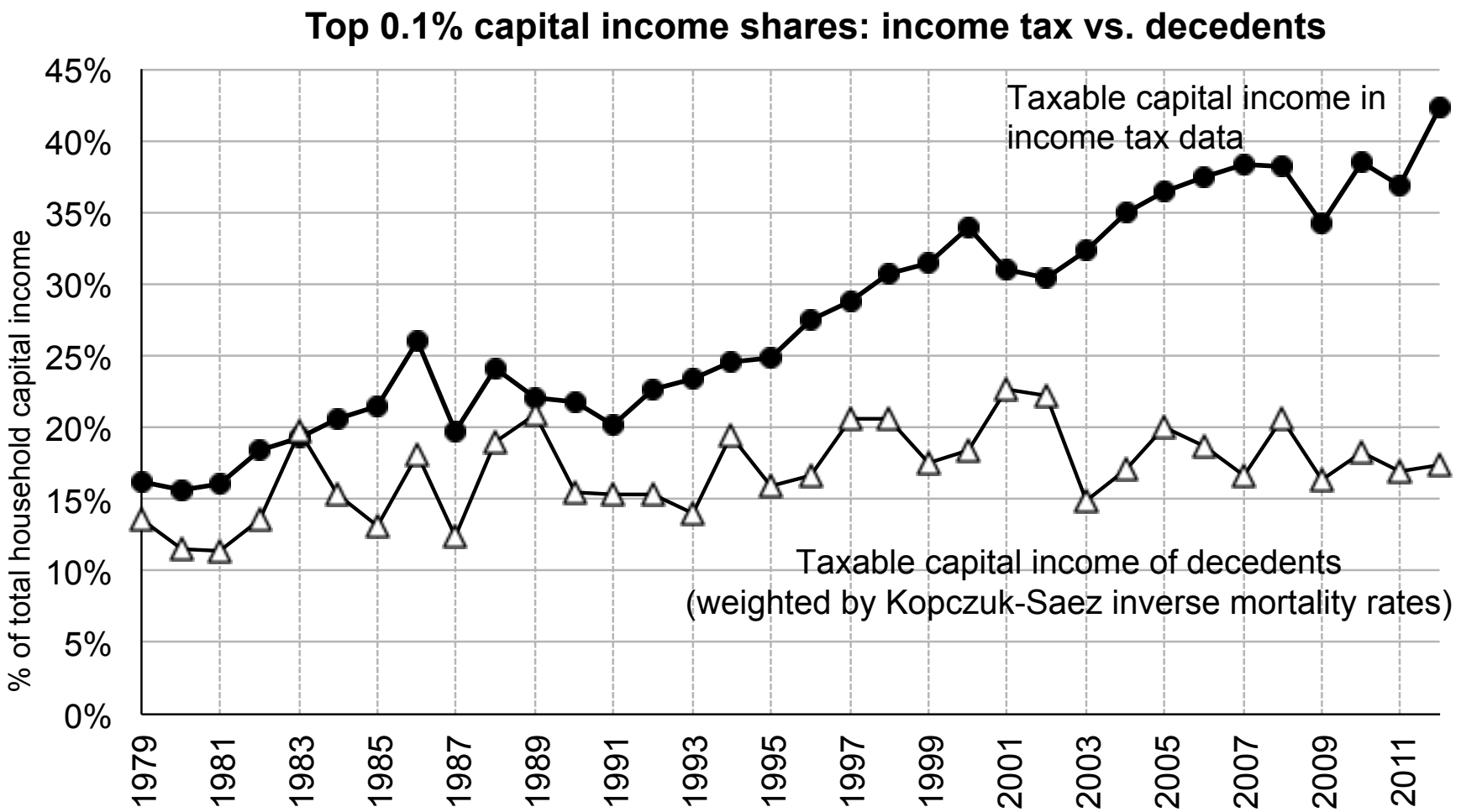
Limits of estate multiplier method

Limit #1: differential mortality by wealth group

- Hard to estimate; can vary over time

Limite #2: death is not a random event

- Approach of death affects behavior: labor supply, investment strategy, health spending, gifts, tax planning...
- Illustration of the bias in the case of the US, matching estates and income tax data

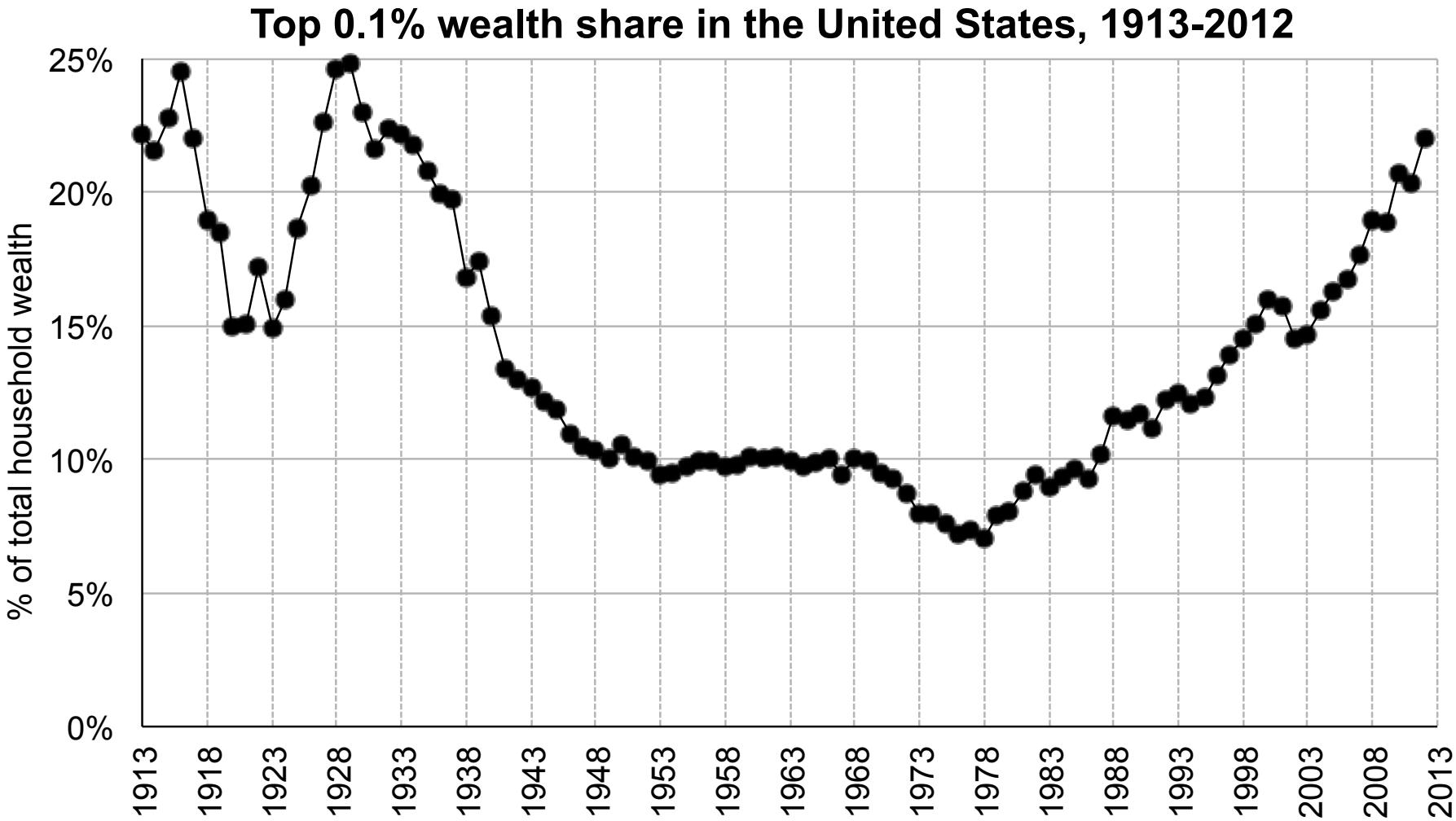


The figure depicts the top 0.1% taxable capital income share (including realized capital gains) in (i) the SOI income tax data; (ii) the sample of decedents weighted using the Kopczuk-Saez (2004) estate mutiplier weights.

Source: Saez and Zucman (2016)

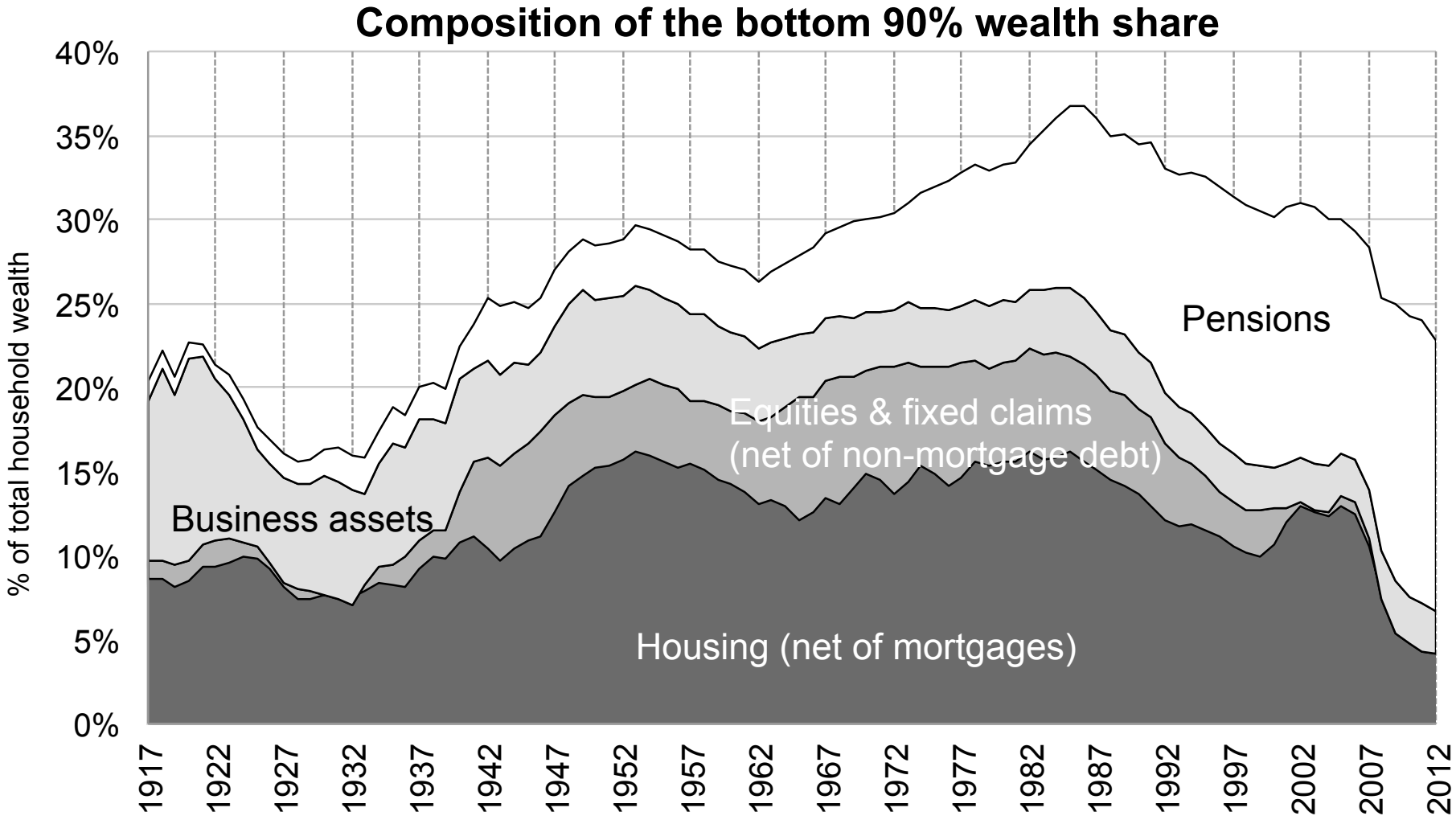
Income capitalization method

- Start from capital income reported in personal income tax returns
- Compute rate of return on each asset class
- Multiply capital income by inverse of rate of return
- Limit: does not work well if taxable rates of return vary with wealth
- Saez and Zucman (2016): in US context, capitalization technique seems to deliver reliable results
- Suggests US experience very different than Europe's



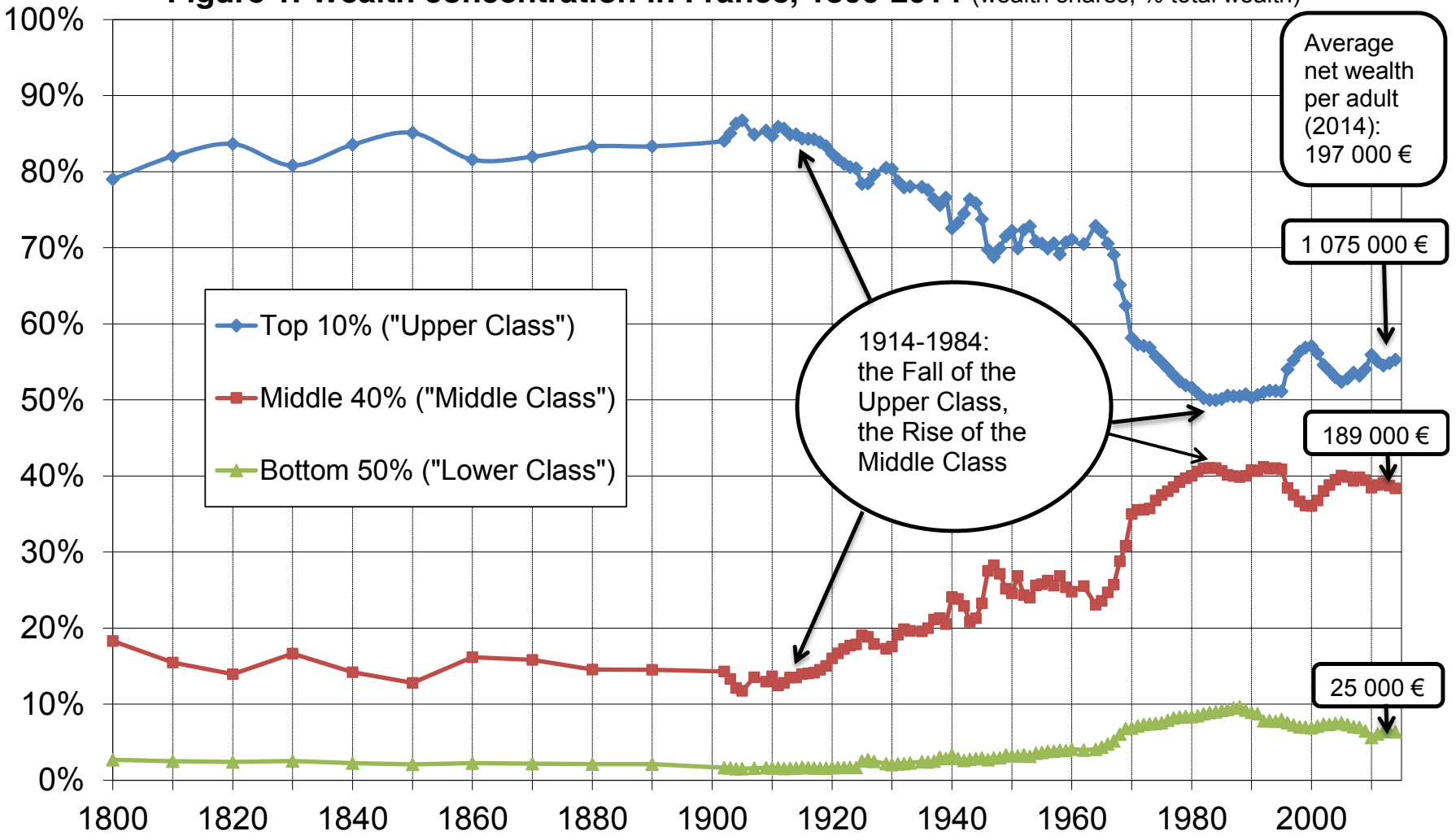
This figure depicts the share of total household wealth held by the 0.1% richest families, as estimated by capitalizing income tax returns. In 2012, the top 0.1% includes about 160,000 families with net wealth above $20.6 million. Source: Appendix Table B1.

Source: Saez and Zucman (2016)



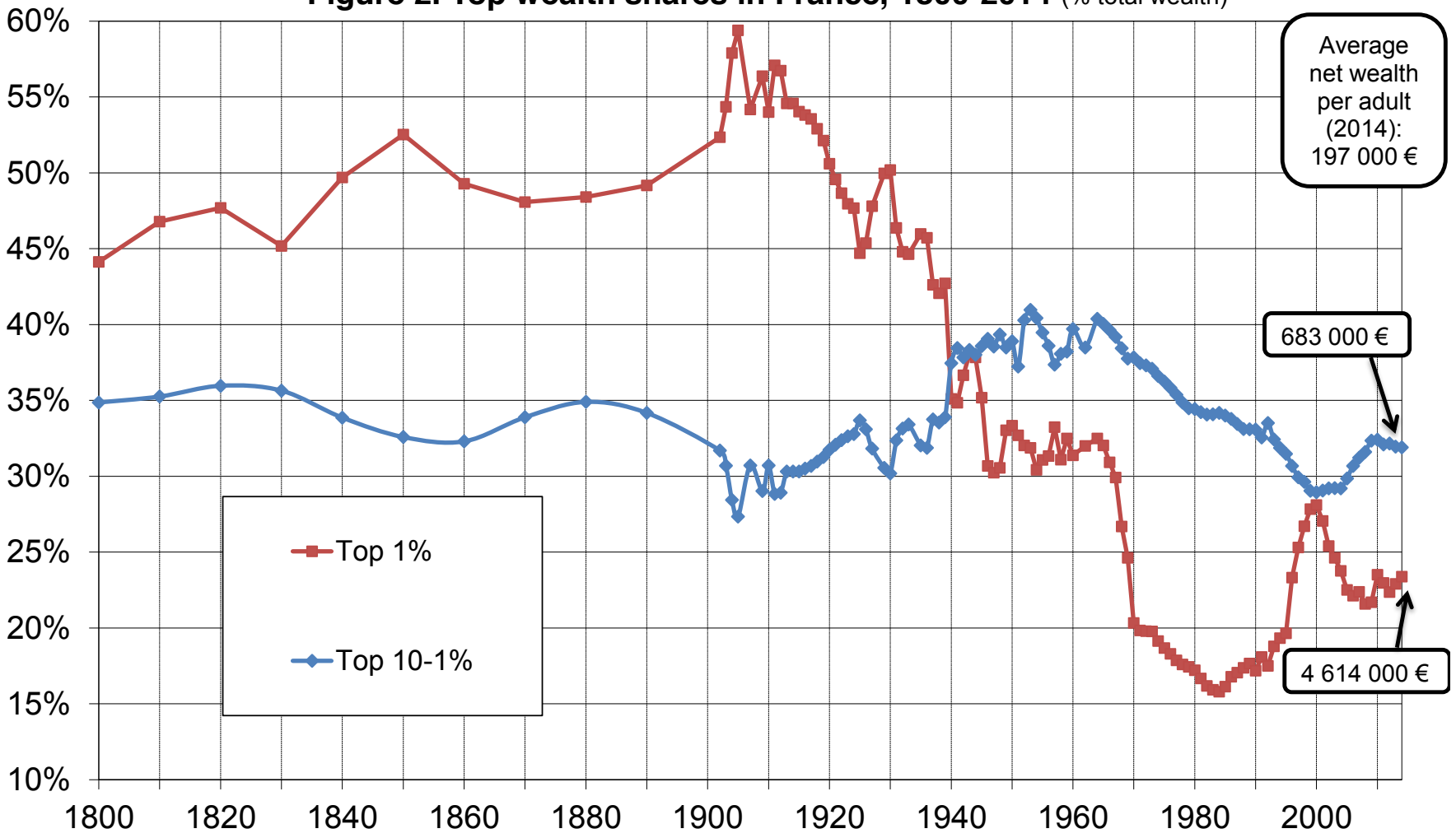
Source: Saez and Zucman (2016)

Figure 1. Wealth concentration in France, 1800-2014 (wealth shares, % total wealth)



Source: Garbinti, Goupille, Piketty (2017)

Figure 2. Top wealth shares in France, 1800-2014 (% total wealth)

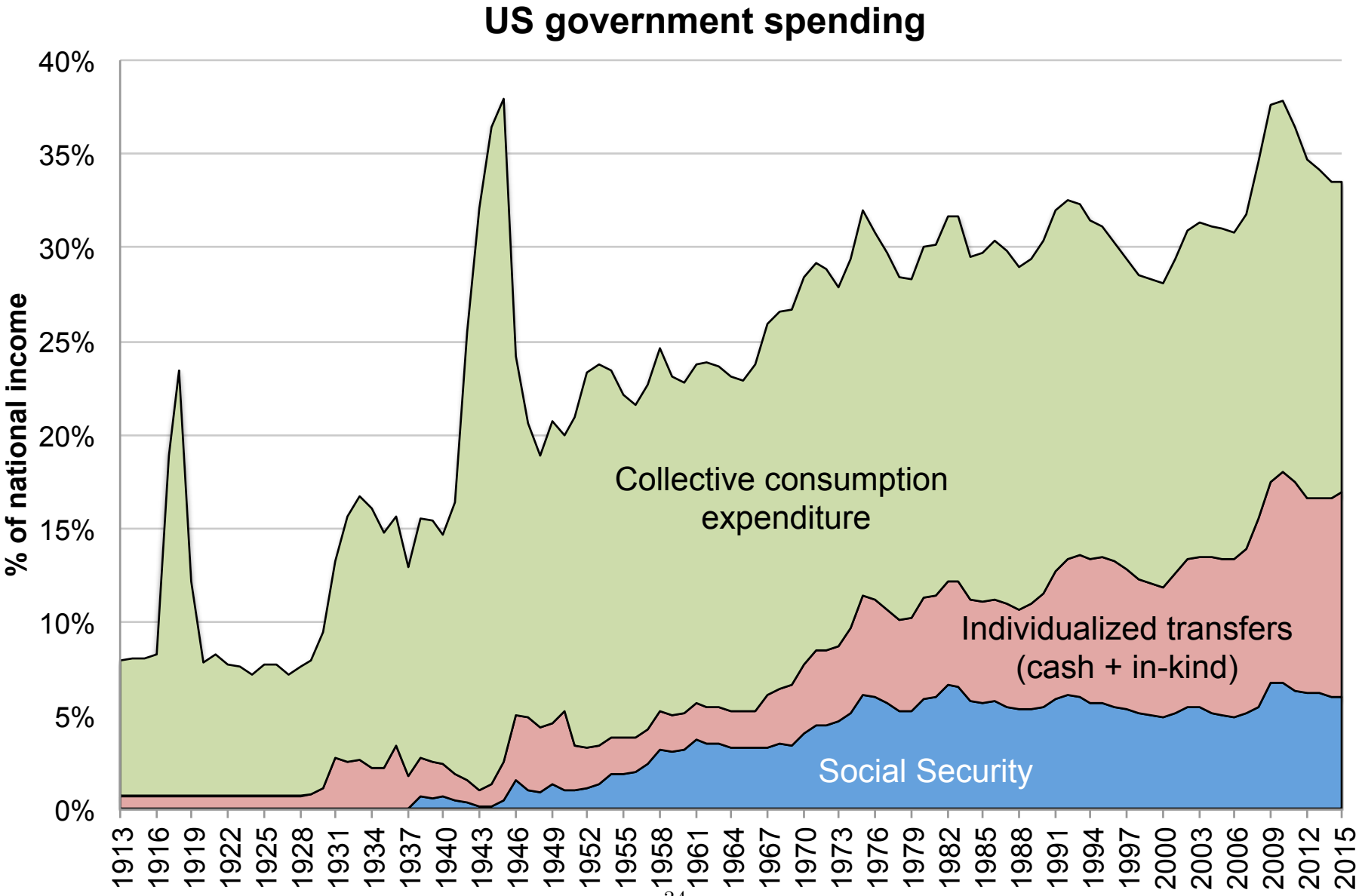


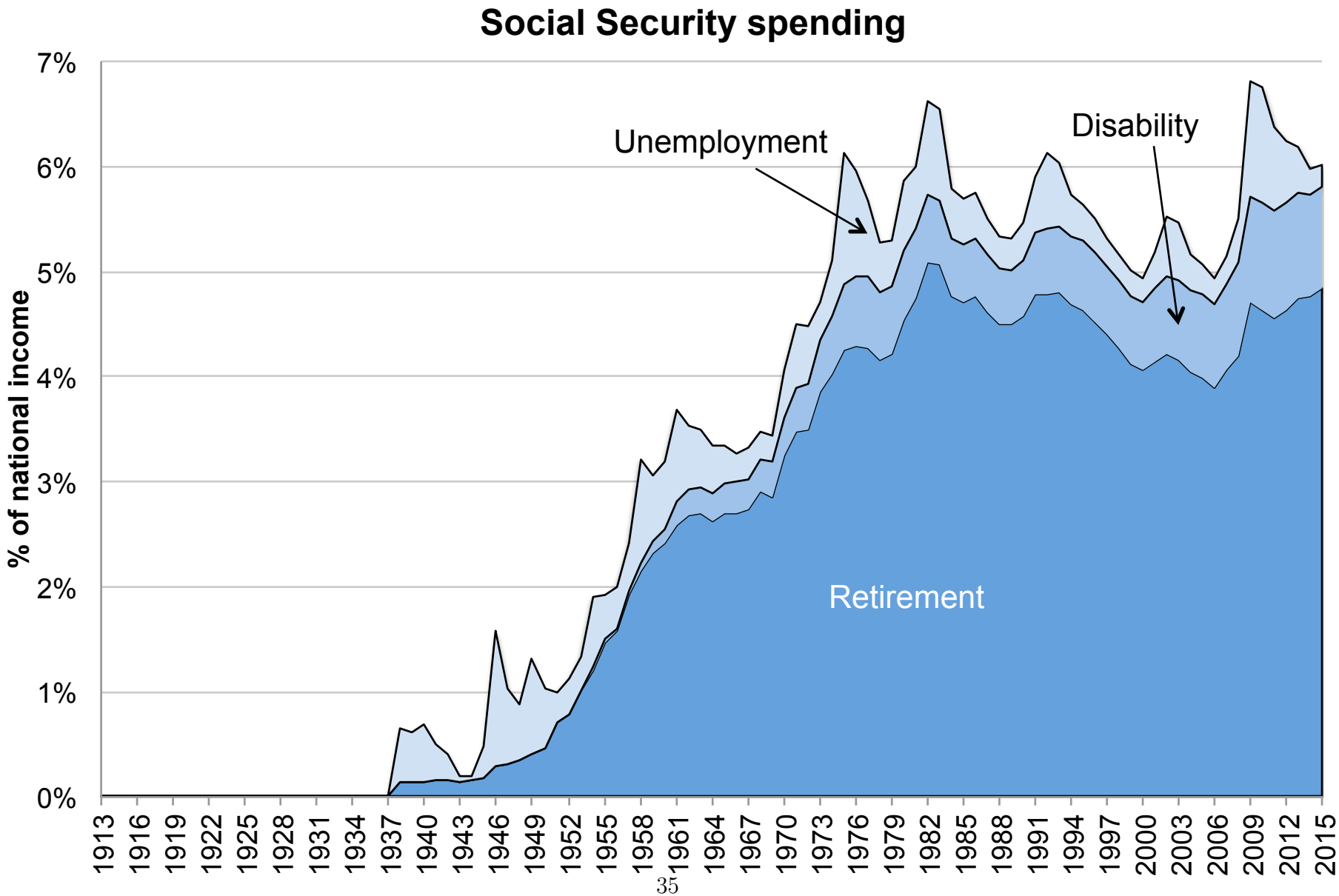
Source: Garbinti, Goupille, Piketty (2017)

4 The effect of taxes and transfers on inequality

Governments tax and redistribute a big fraction of national income

- US: 1/3 of national income
- Europe: 40-50% of national income
- Developing countries: 5-30% of national income
- Strong correlation between development and size of gov.


US government spending
% of national income
40%
35%
30%
25%
20%
15%
10%
5%
0%
Collective consumption expenditure
Individualized transfers (cash + in-kind)
Social Security
1913
1916
1919
1922
1925
1928
1931
1934
1937
1940
1943
1946
1949
1952
1955
1958
1961
1964
1967
1970
1973
1976
1979
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015


Social Security spending
% of national income
7%
6%
5%
4%
3%
2%
1%
0%
Unemployment
Disability
Retirement
1913
1916
1919
1922
1925
1928
1931
1934
1937
1940
1943
1946
1949
1952
1955
1958
1961
1964
1967
1970
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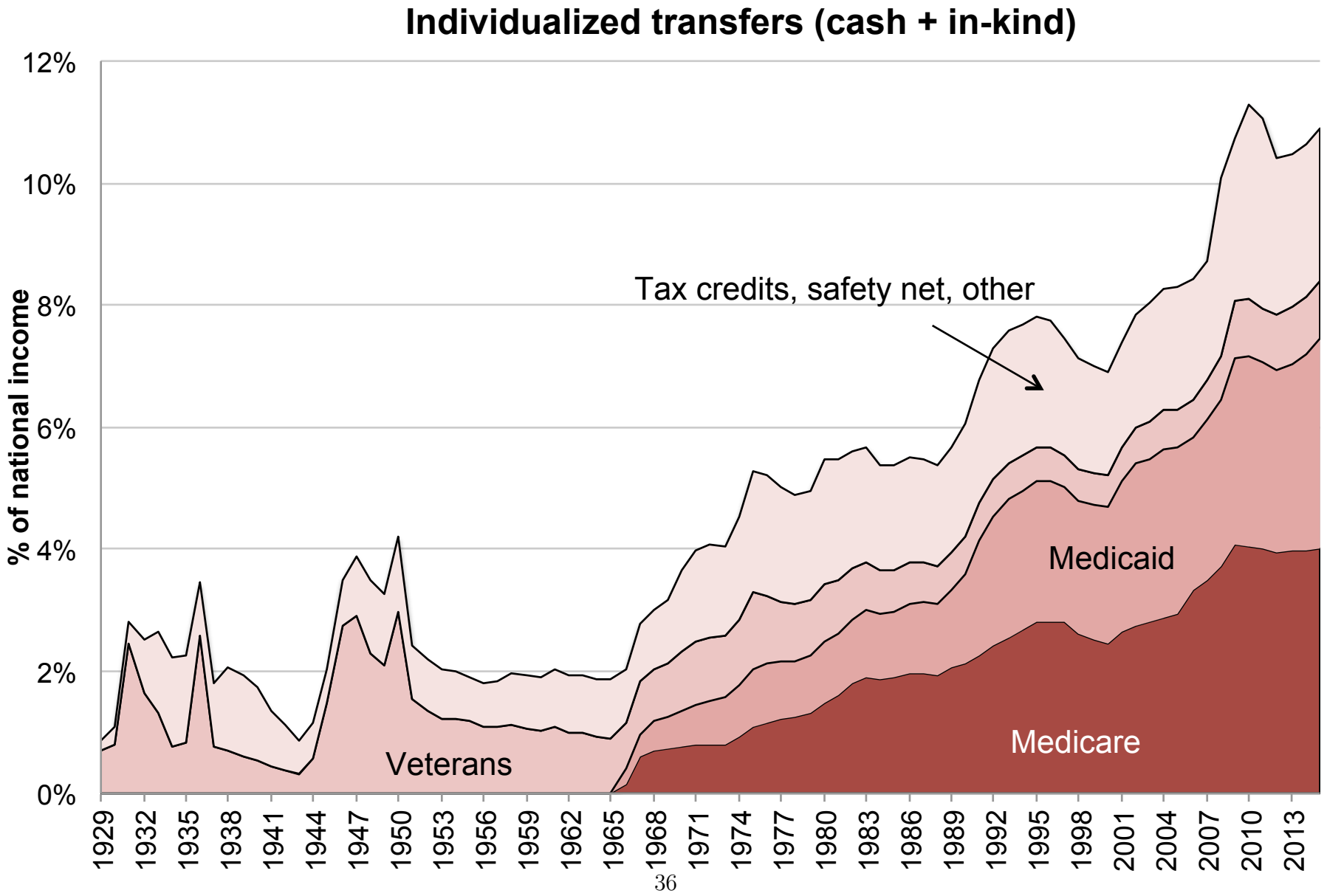
1994
1997
2000
2003
2006
2009
2012
2015


Individualized transfers (cash + in-kind)
% of national income
12%
10%
8%
6%
4%
2%
0%
Tax credits, safety net, other
Medicaid
Medicare
Veterans
1929
1932
1935
1938
1941
1944
1947
1950
1953
1956
1959
1962
1965
1968
1971
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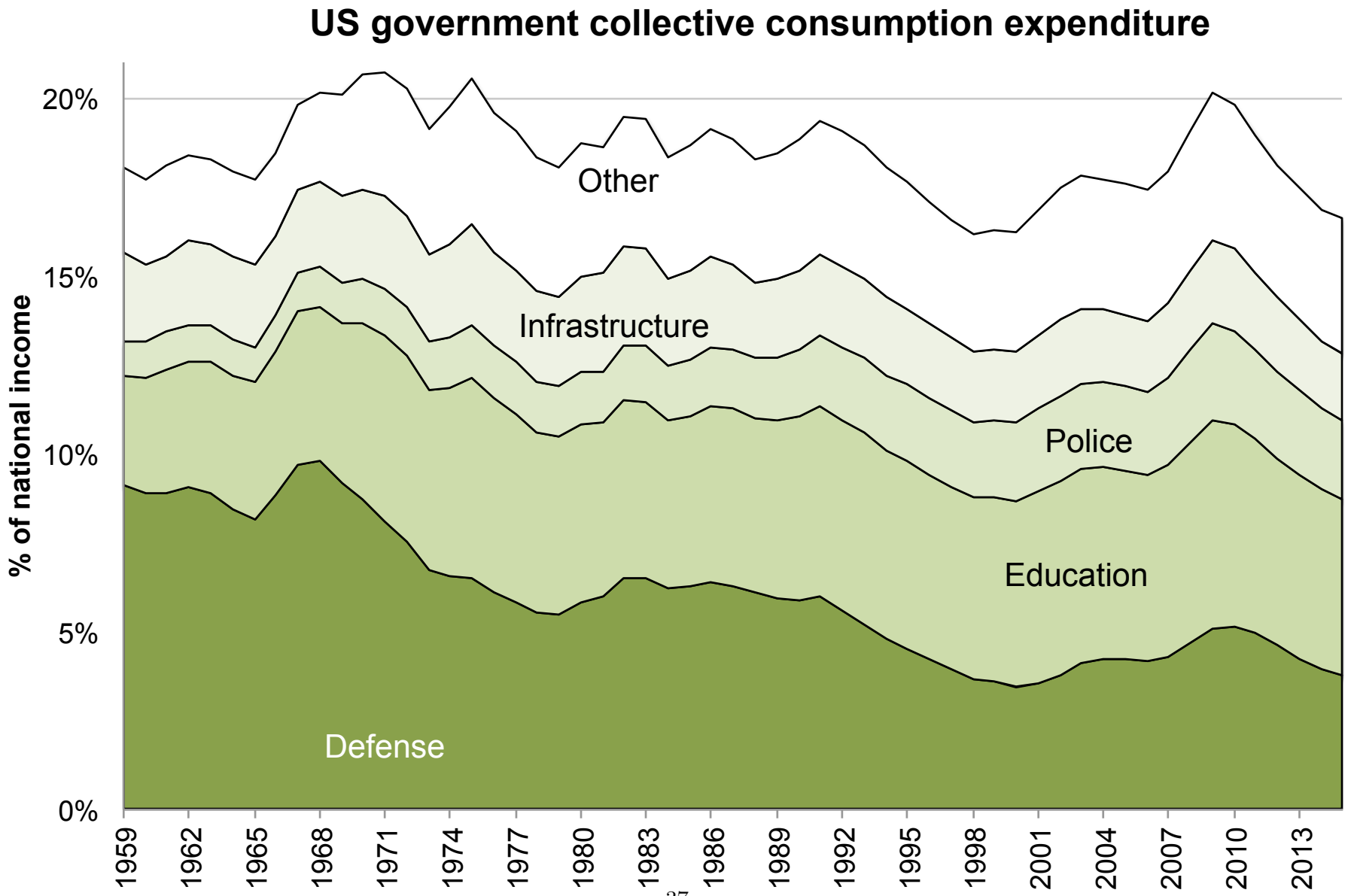
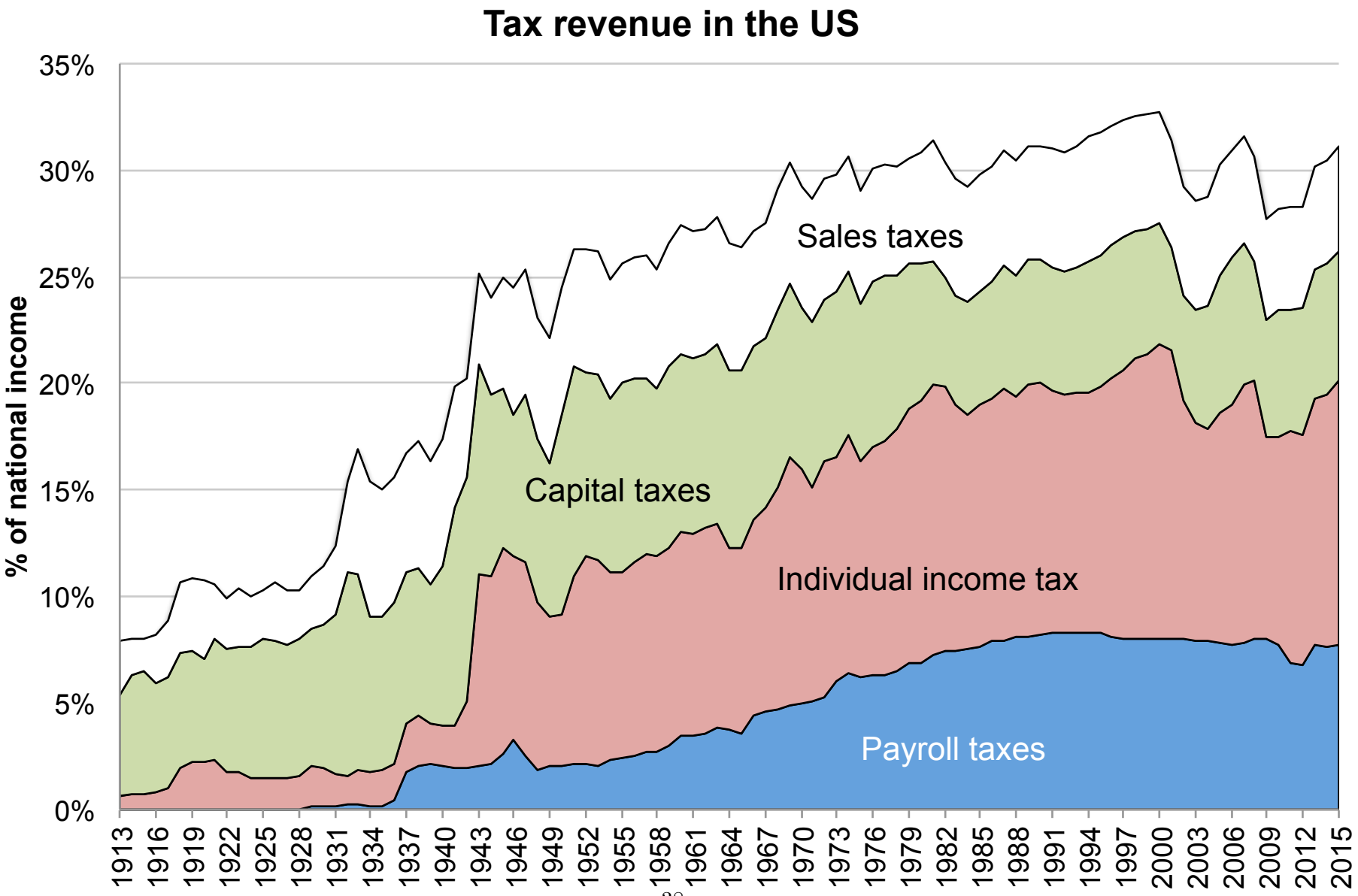
2001
2004
2007
2010
2013


US government collective consumption expenditure
% of national income
20%
15%
10%
5%
0%
Other
Infrastructure
Police
Education
Defense
1959
1962
1965
1968
1971
1974
1977
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
2013


Tax revenue in the US
% of national income
35%
30%
25%
20%
15%
10%
5%
0%
Sales taxes
Capital taxes
Individual income tax
Payroll taxes
1913
1916
1919
1922
1925
1928
1931
1934
1937
1940
1943
1946
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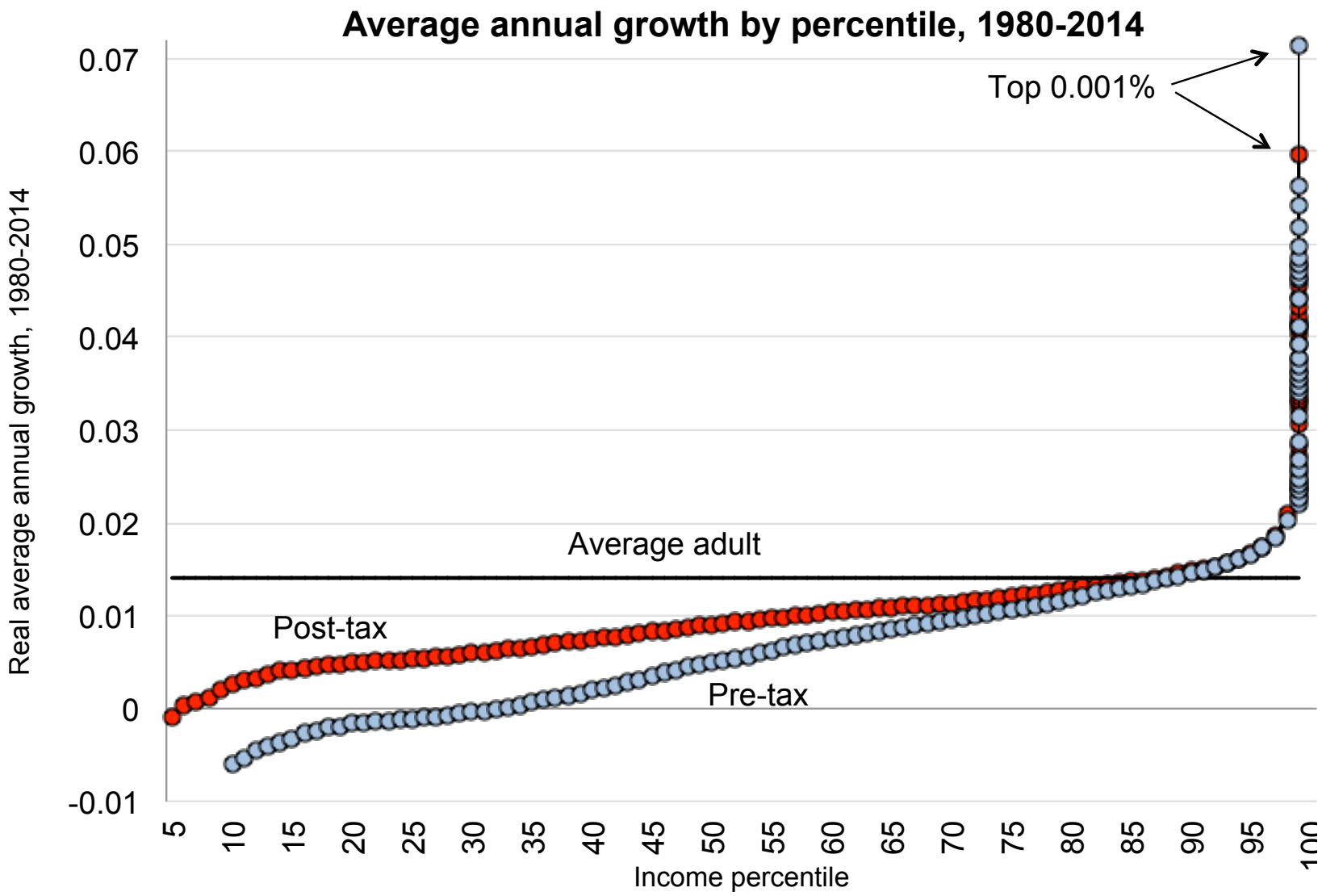
2003
2006
2009
2012
2015

Post-tax vs. pre-tax inequality

- Denote z pre-tax income, $y = z - T(z) + B(z)$ post-tax income
- If inequality in y is less than inequality in $z \Leftrightarrow$ tax and transfer system is redistributive (or progressive)
- US tax and transfer system is overall redistributive: post-tax income is more equally distributed than pre-tax income
- But redistribution of limited size and has not offset rise in pre-tax inequality

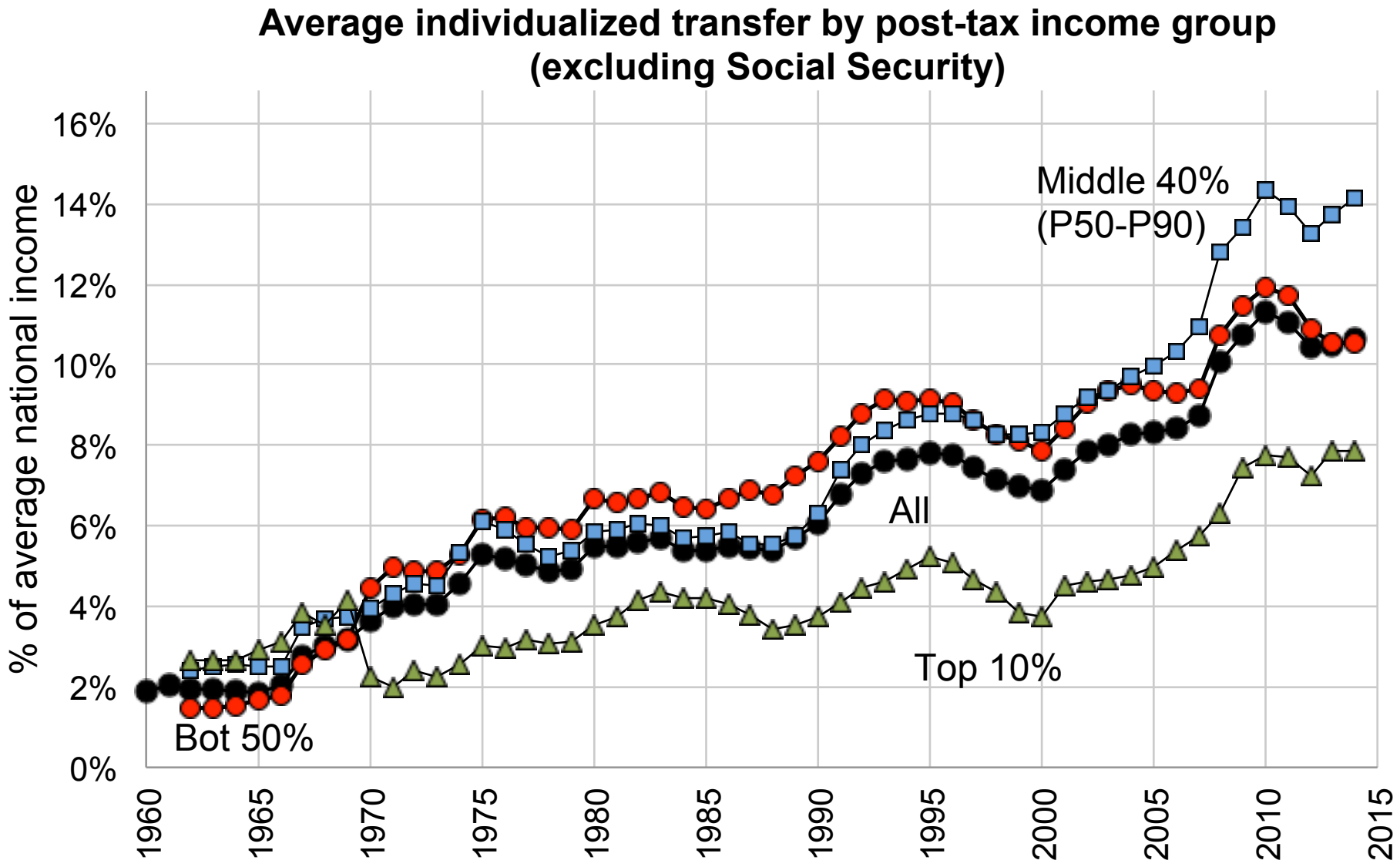


Source: Piketty, Saez and Zucman (2016).

Who receives government transfers?

- Individualized transfers have increased a lot in the US since 1960s, because of rise in health transfers (+ Social Security)
- Middle-class & retirees have benefited the most from this increase
- Bottom 50% has benefited less: rise in Medicaid and EITC but collapse in safety net spending

$\rightarrow$ Overall bottom 50% receives less transfers than middle class today



Source: Appendix Table II-G4.


Government spending on safety net
(food stamps + SSI + temporary assistance)
% of national income
1.6%
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
1929
1933
1937
1941
1945
1949
1953
1957
1961
1965
1969
1973
1977
1981
1985
1989
1993
1997
2001
2005
2009
2013

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