

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 → key question: are market economies better than planned economies at allocating resources?
- Lots of progress made: fundamental theorems of welfare economics; market failures; 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 → labor supply increases → 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 → 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 (→ 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 → workers’ revolution
- Prediction #2: Fall in rate of return to capital → 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:

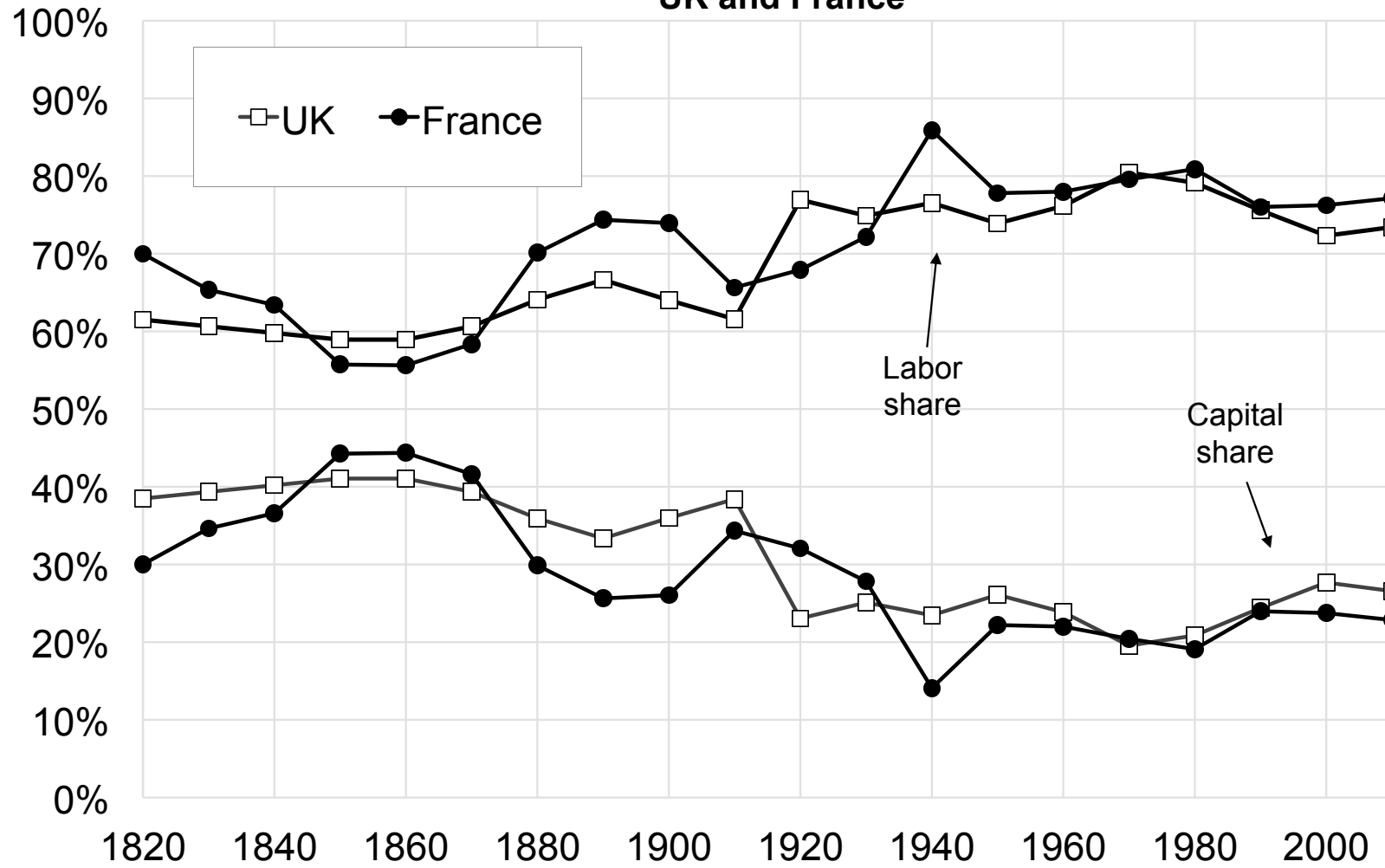
$$F(K, L) = (a \cdot K^{\frac{\sigma-1}{\sigma}} + (1-a) \cdot L^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}}$$

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

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

- As $\sigma \rightarrow \infty$, the production function becomes linear:
 $Y = rK + vL$. Robot economy
- As $\sigma \rightarrow 0$, the production function becomes putty-clay, i.e.
 $F(K, L) = \min(rK, vL)$: no substitution possibility
- As $\sigma \rightarrow 1$, 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)...

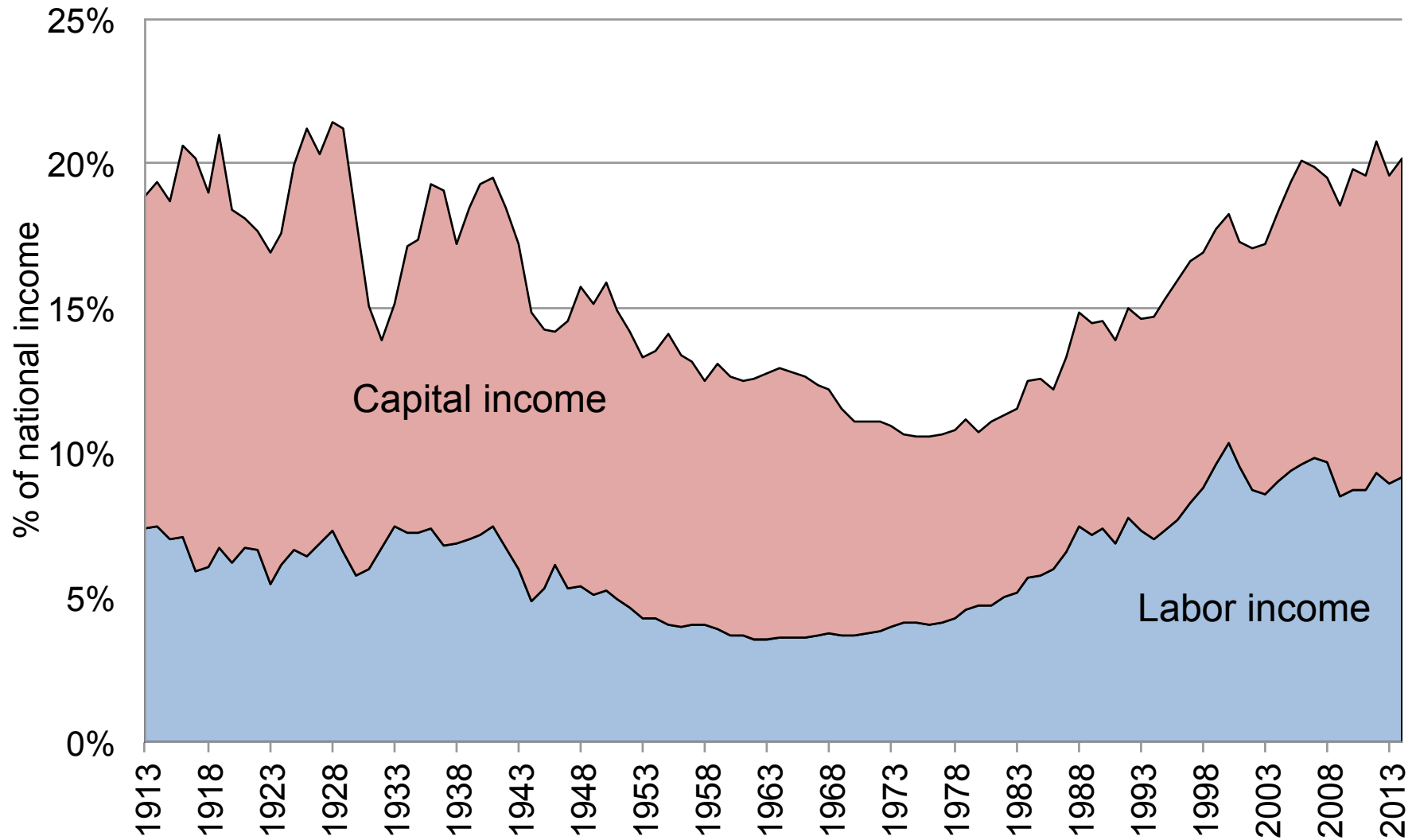
- Distribution of y_K \rightarrow inheritance, saving rates, rates of return, capital controls, capital taxation, ...
- Factor shares $\alpha = Y_K/Y$ and $1 - \alpha \rightarrow$ technology, bargaining power, competition policy, globalization...
- Joint distribution of labor and capital income
- By 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 Inequality 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 → 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

Three main limits of top income share studies:

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

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

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

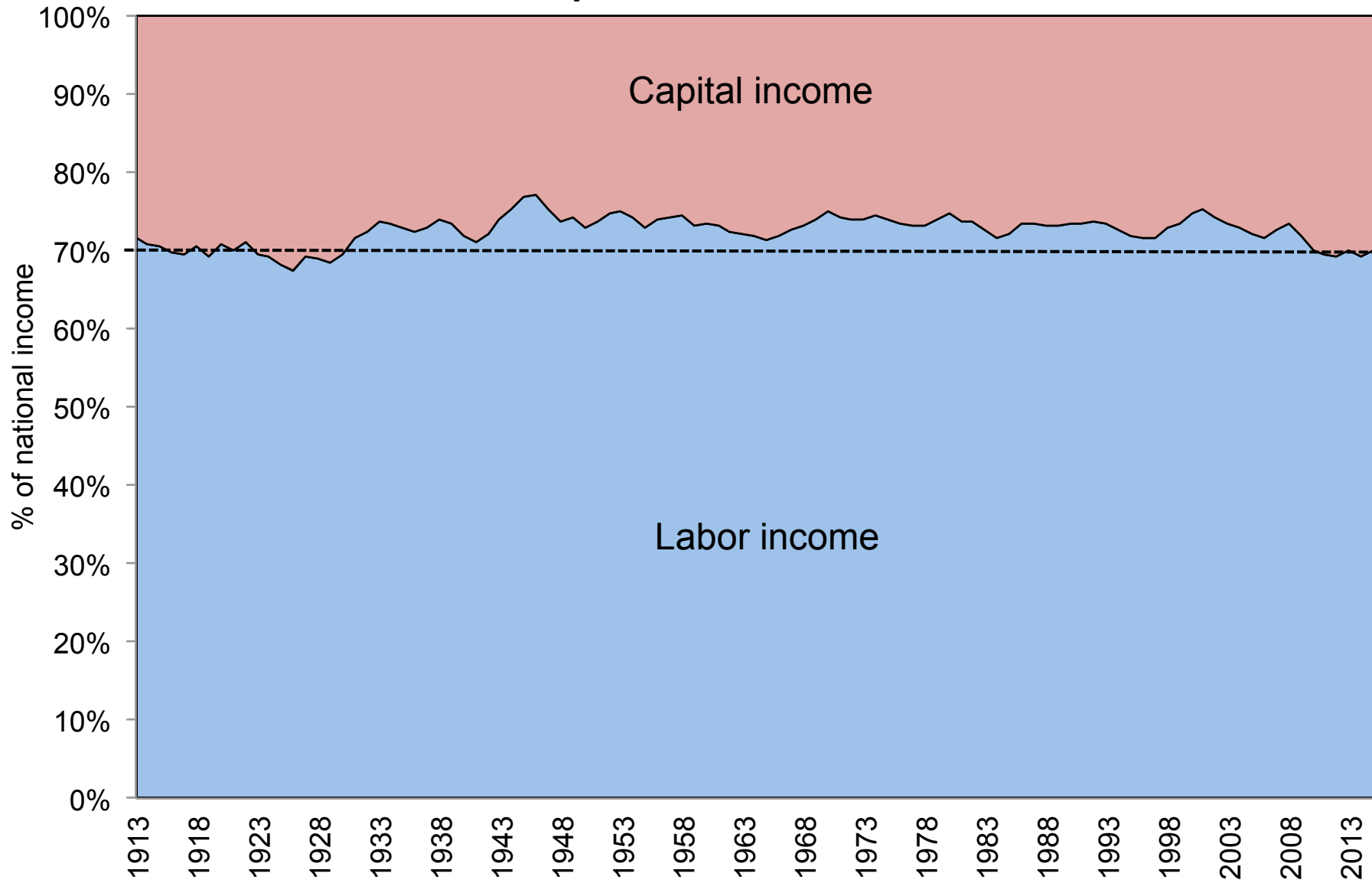
- Many transfers not taxable

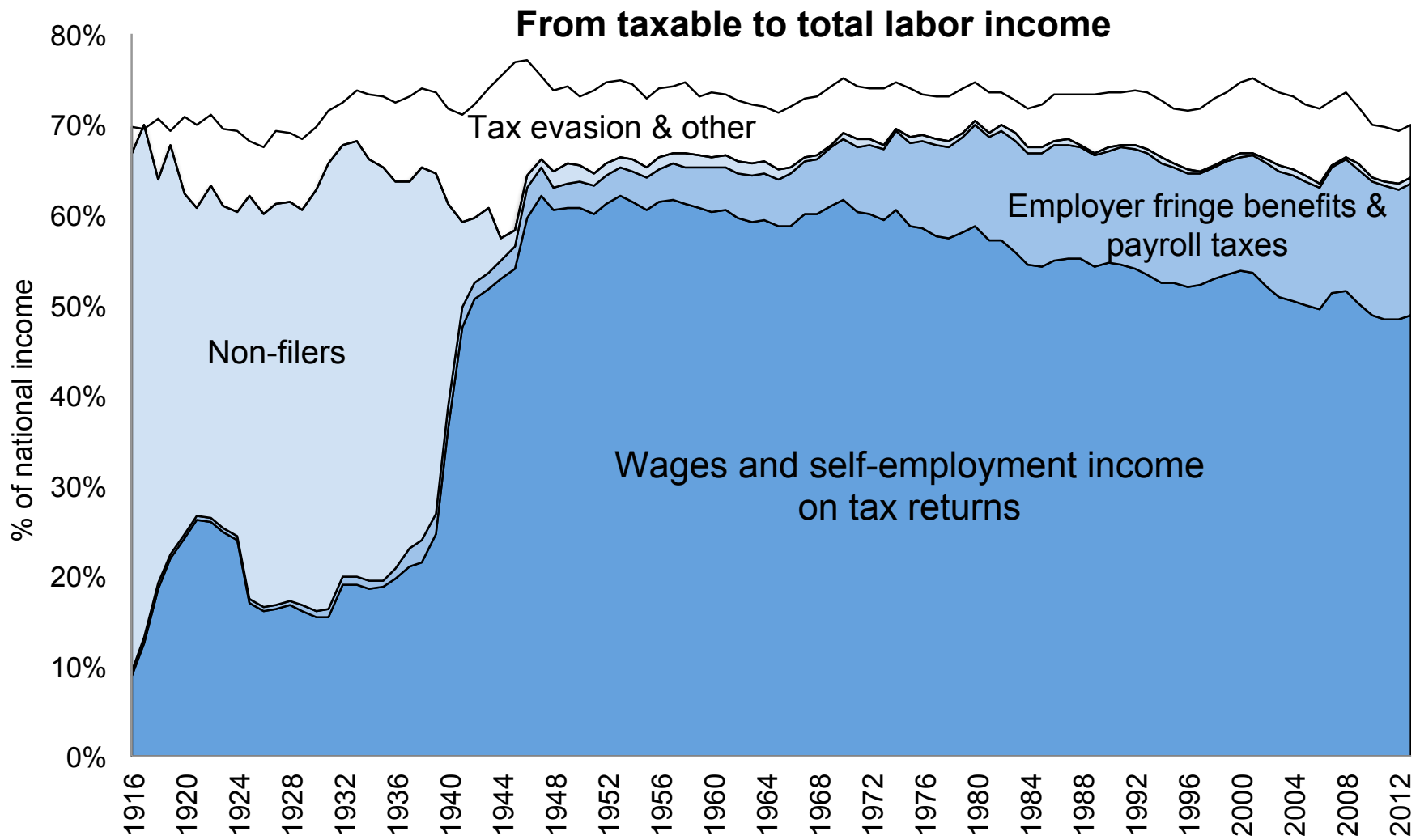
Limit 3: Little data for developing countries

Current research frontier:

- Bridging inequality/macro gap (distribution of untaxed capital income, tax evasion, fringe benefits)
- Impact of taxes and transfers (tax incidence, transfer take-up and under-reporting in surveys)
- Inequality in developing countries and global trends (major data issues: labor vs. capital shares; tax vs. survey data; offshore wealth)

The share of capital and labor in national income

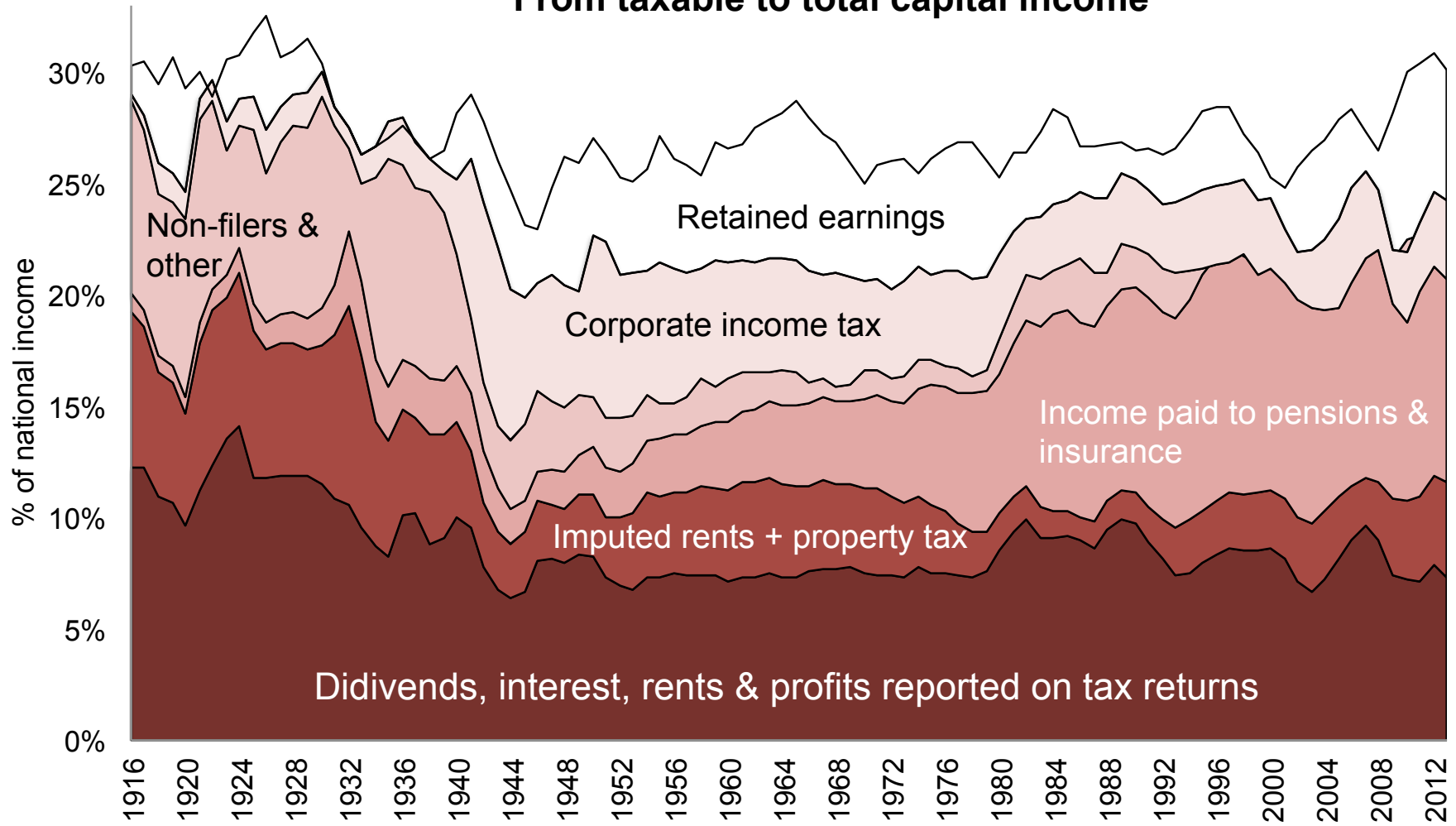




Source: Appendix Table I-S.A8b.

Source: Piketty, Saez and Zucman (2018)

From taxable to total capital income



Source: Appendix Table I-S.A8.

Source: Piketty, Saez and Zucman (2018)

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

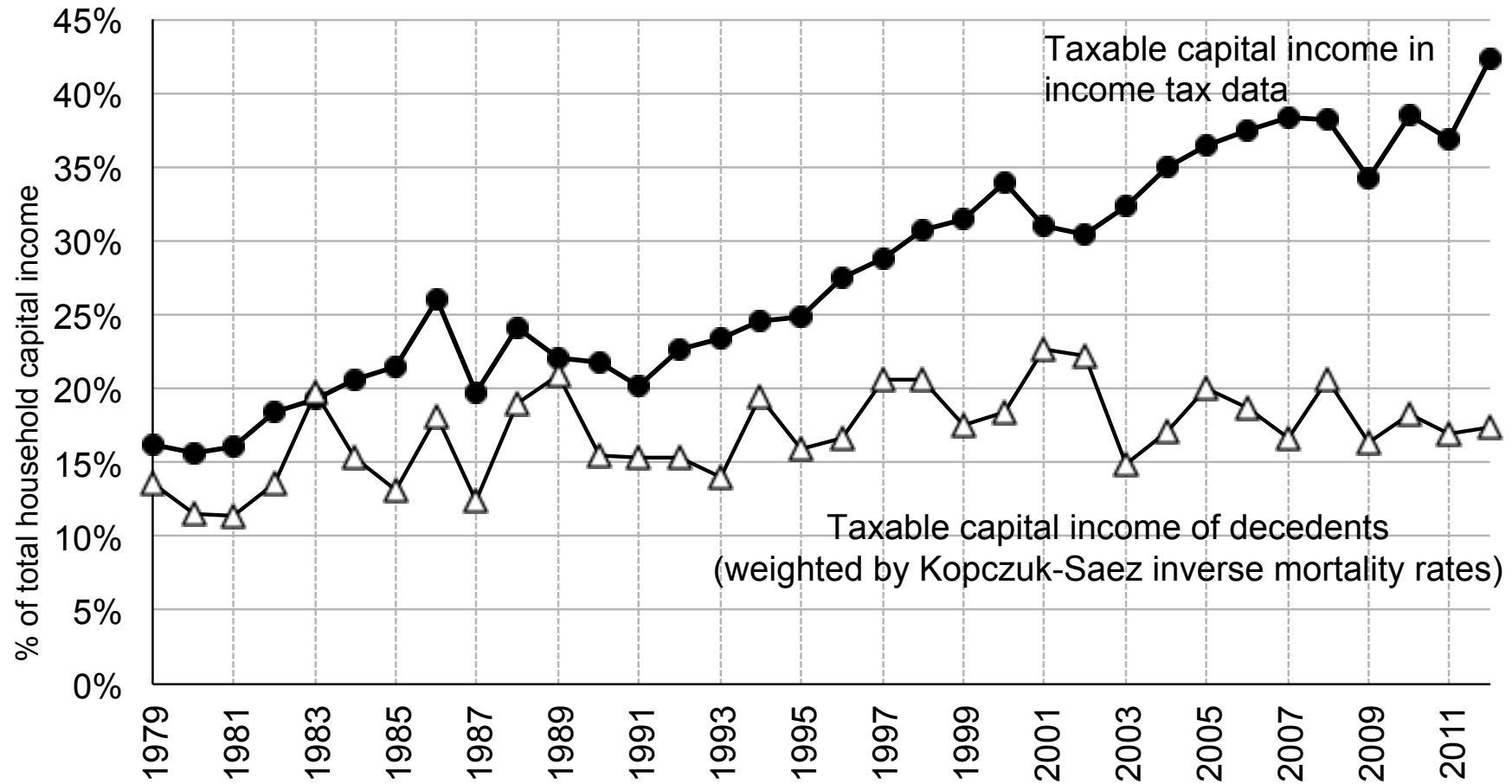
Limit #1: differential mortality by wealth group

- Hard to estimate; can vary over time

Limit #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

Top 0.1% capital income shares: income tax vs. decedents



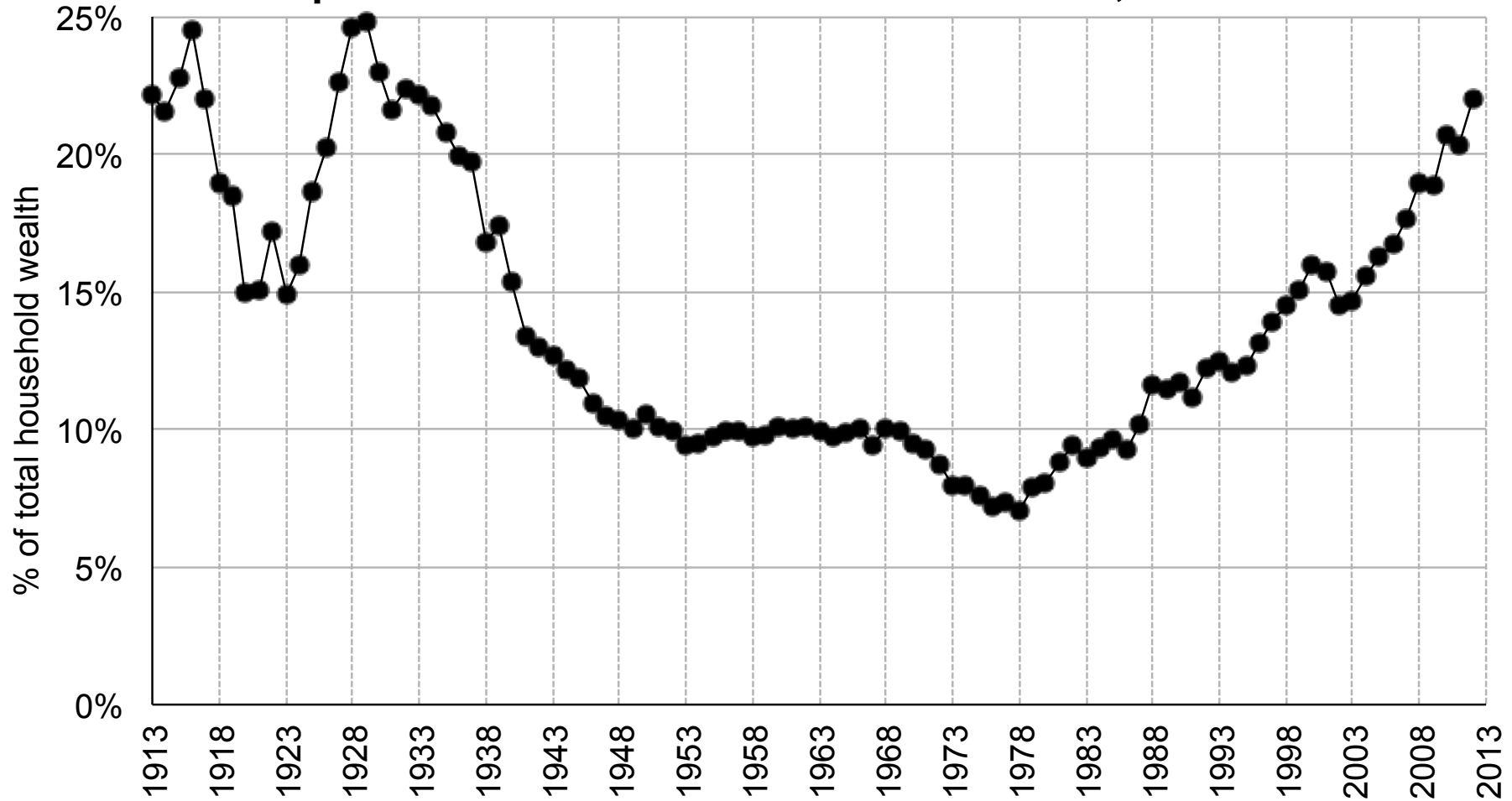
The figure depicts the top 0.1% taxable capital income share (including realized capital gains) in (i) the SOI income tax data; (ii) the sample of decedents weighted using the Kopczuk-Saez (2004) estate multiplier weights.

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

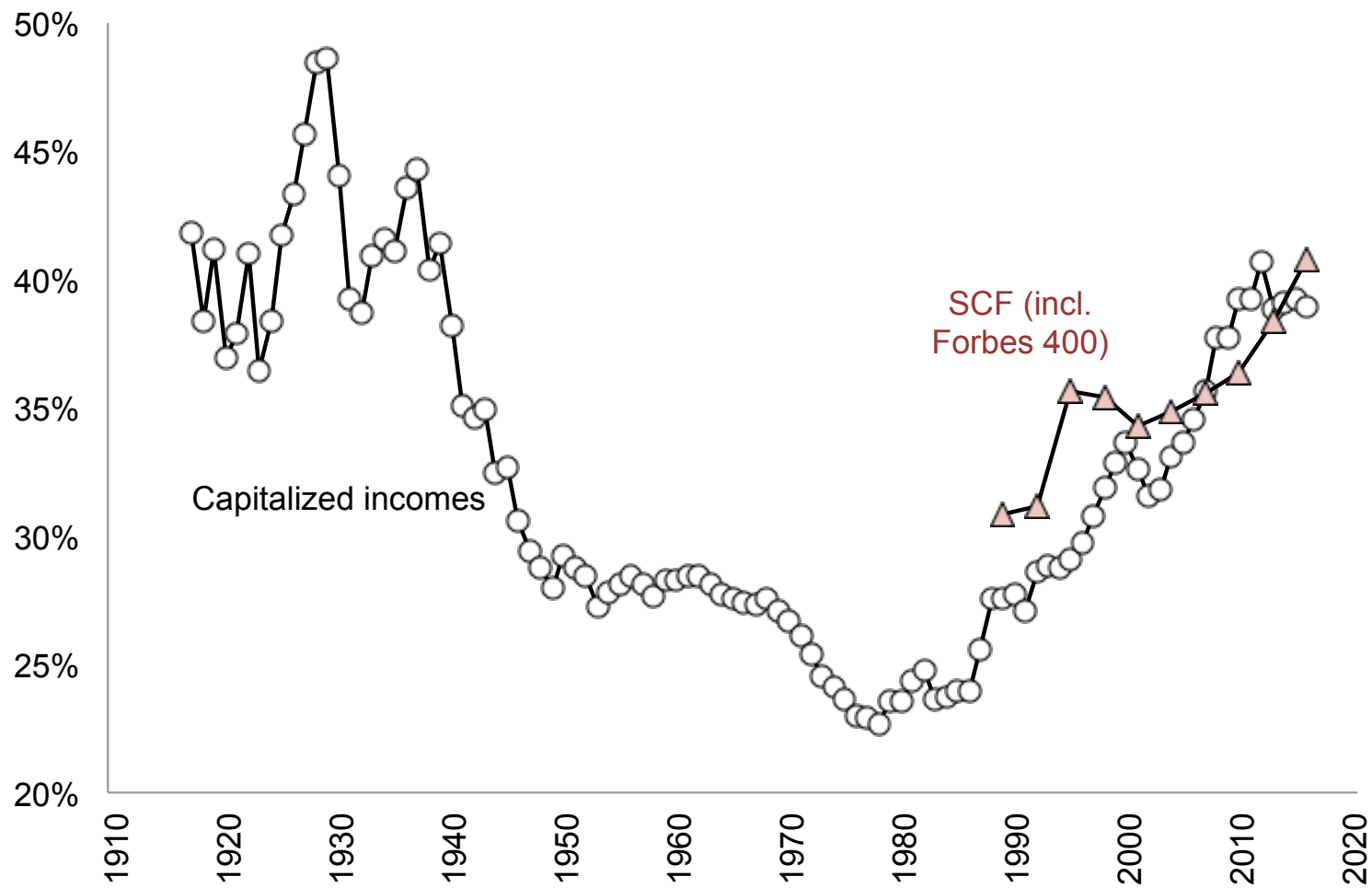
Top 0.1% wealth share in the United States, 1913-2012



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)

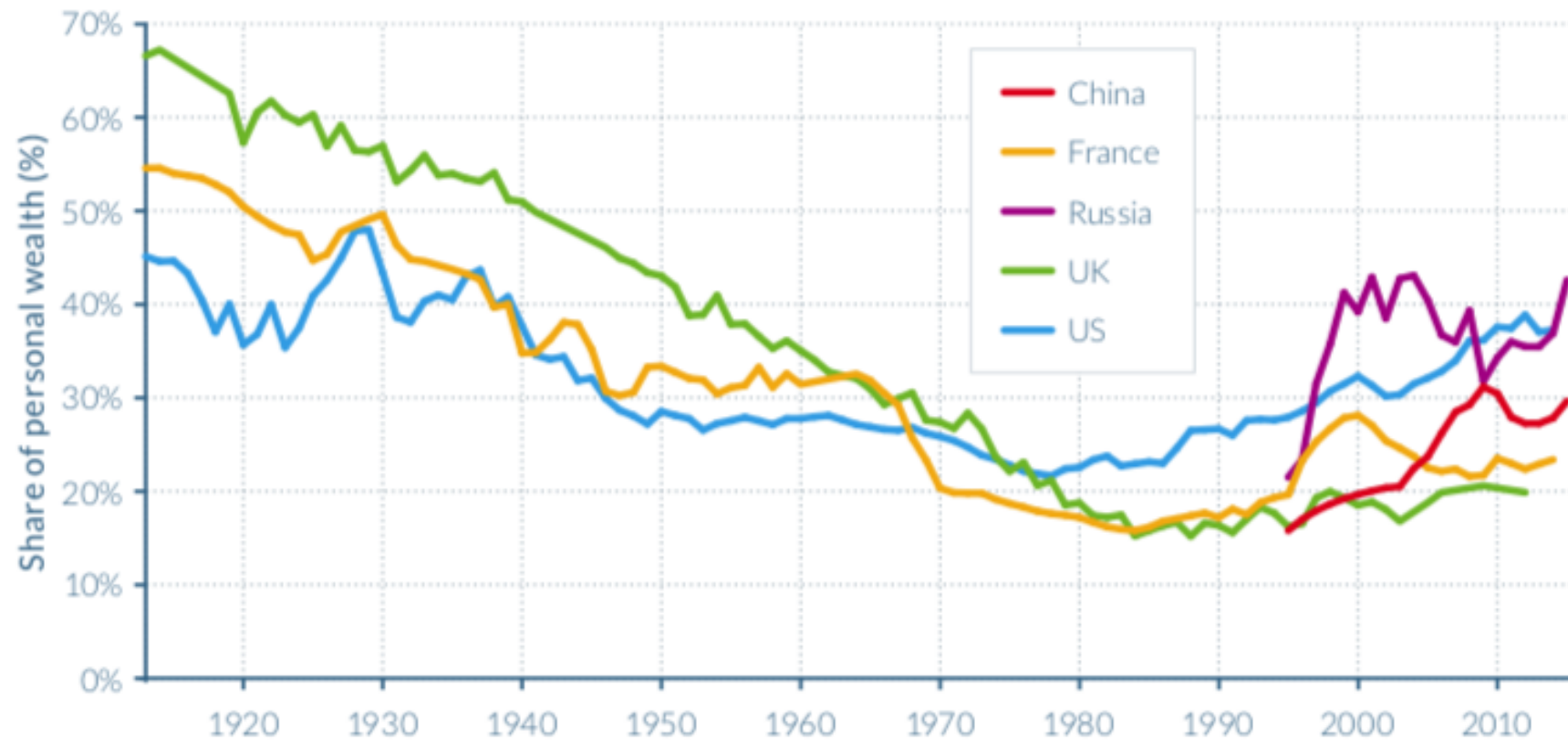
Top 1% US wealth share: capitalized incomes vs. SCF



Source: Zucman (2019)

Figure E8

Top 1% wealth shares across the world, 1913-2015: the fall and rise of personal wealth inequality

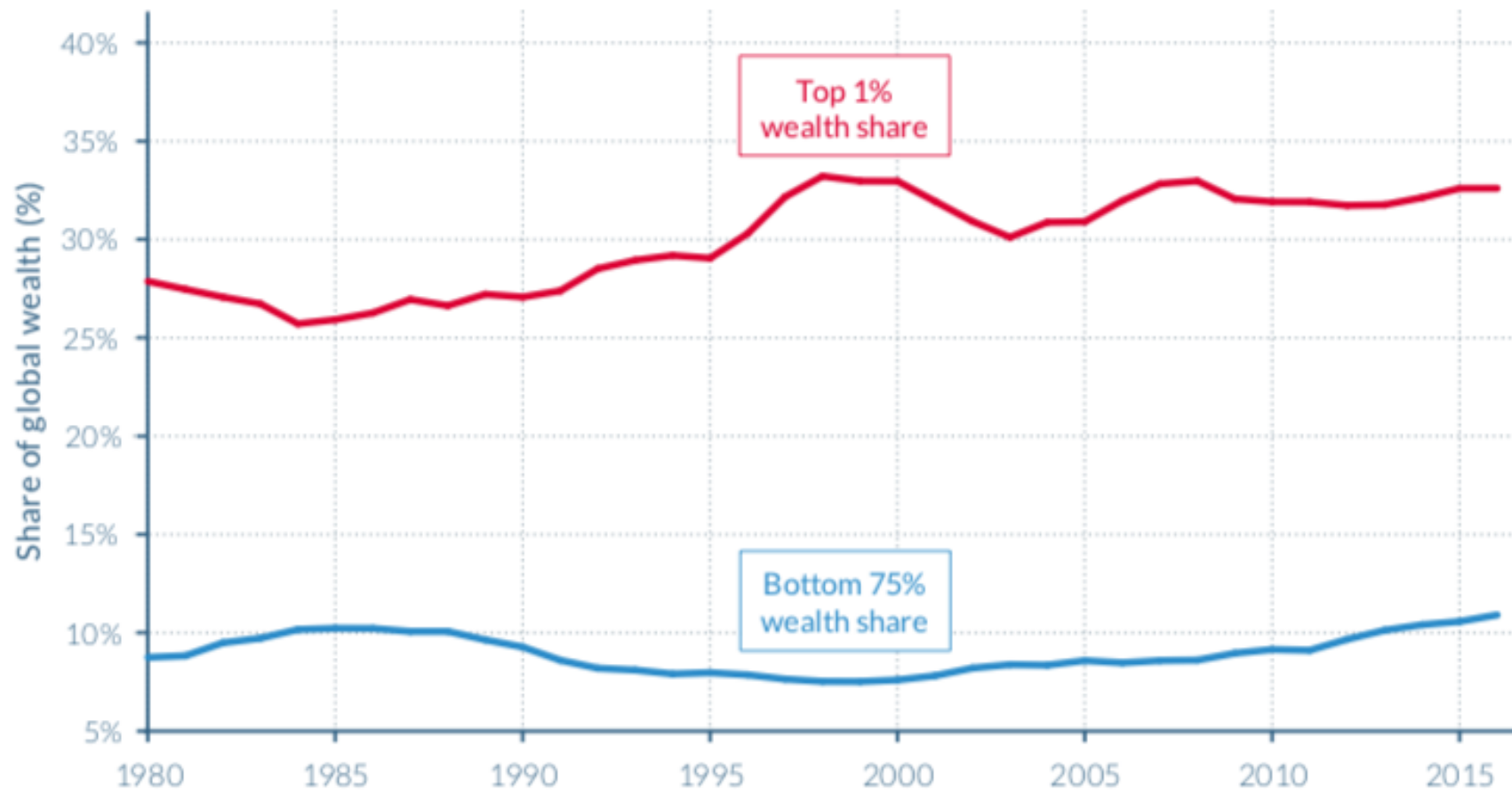


Source: WID.world (2017). See [wir2018.wid.world](#) for data series and notes.

In 2015, the Top 1% wealth share was 43% in Russia against 22% in 1995.

Figure 4.1.1

Top 1% and Bottom 75% shares of global wealth, 1980-2017: China, Europe and the US



Source: WID.world (2017). See [wir 2018.widworld](#) for data series and notes.

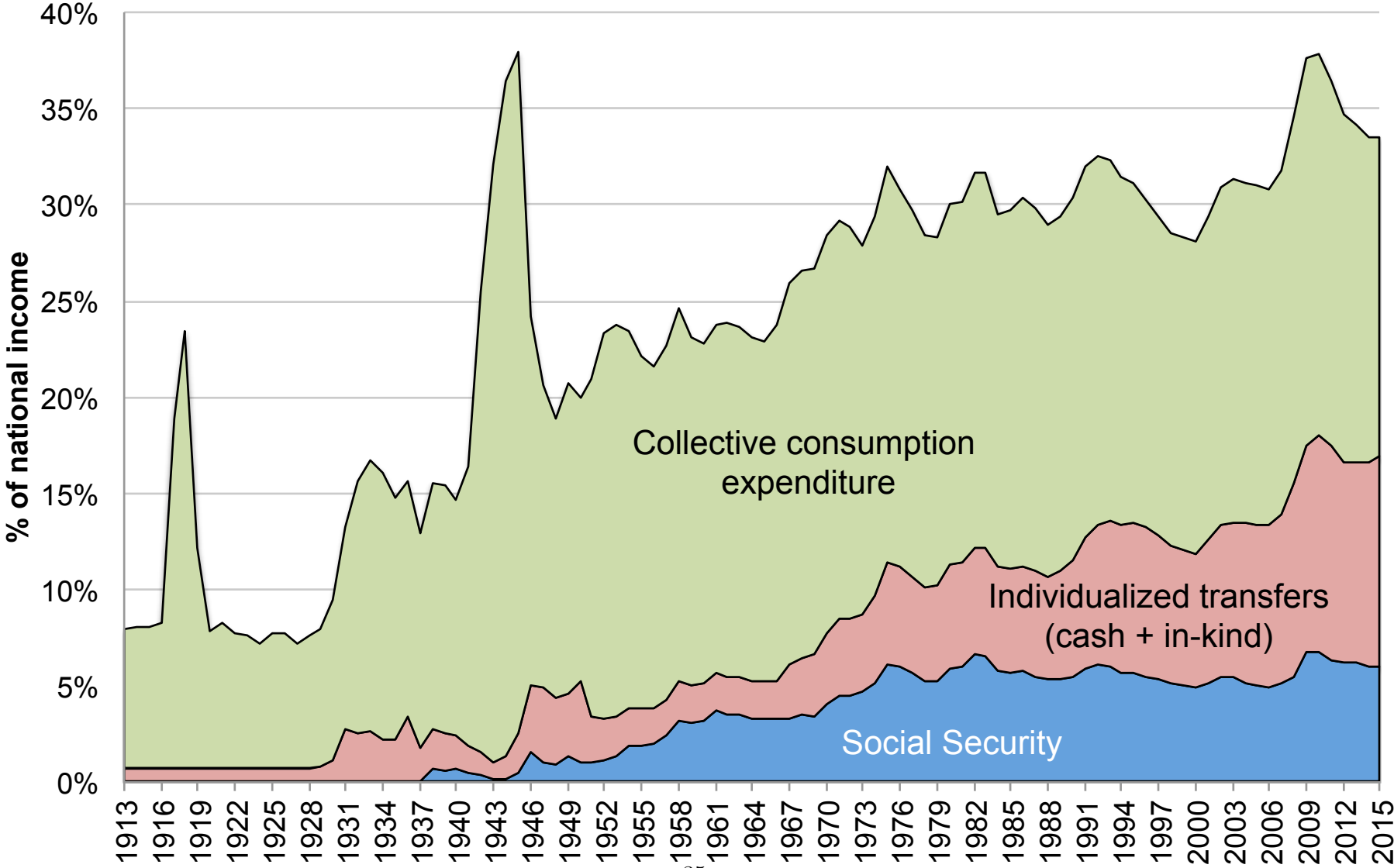
In 2016, 33% of global wealth was owned by the Top 1%. The evolution of global wealth groups from 1980 to 2017 is represented by China, Europe and the US.

4 The effect of taxes and transfers on inequality

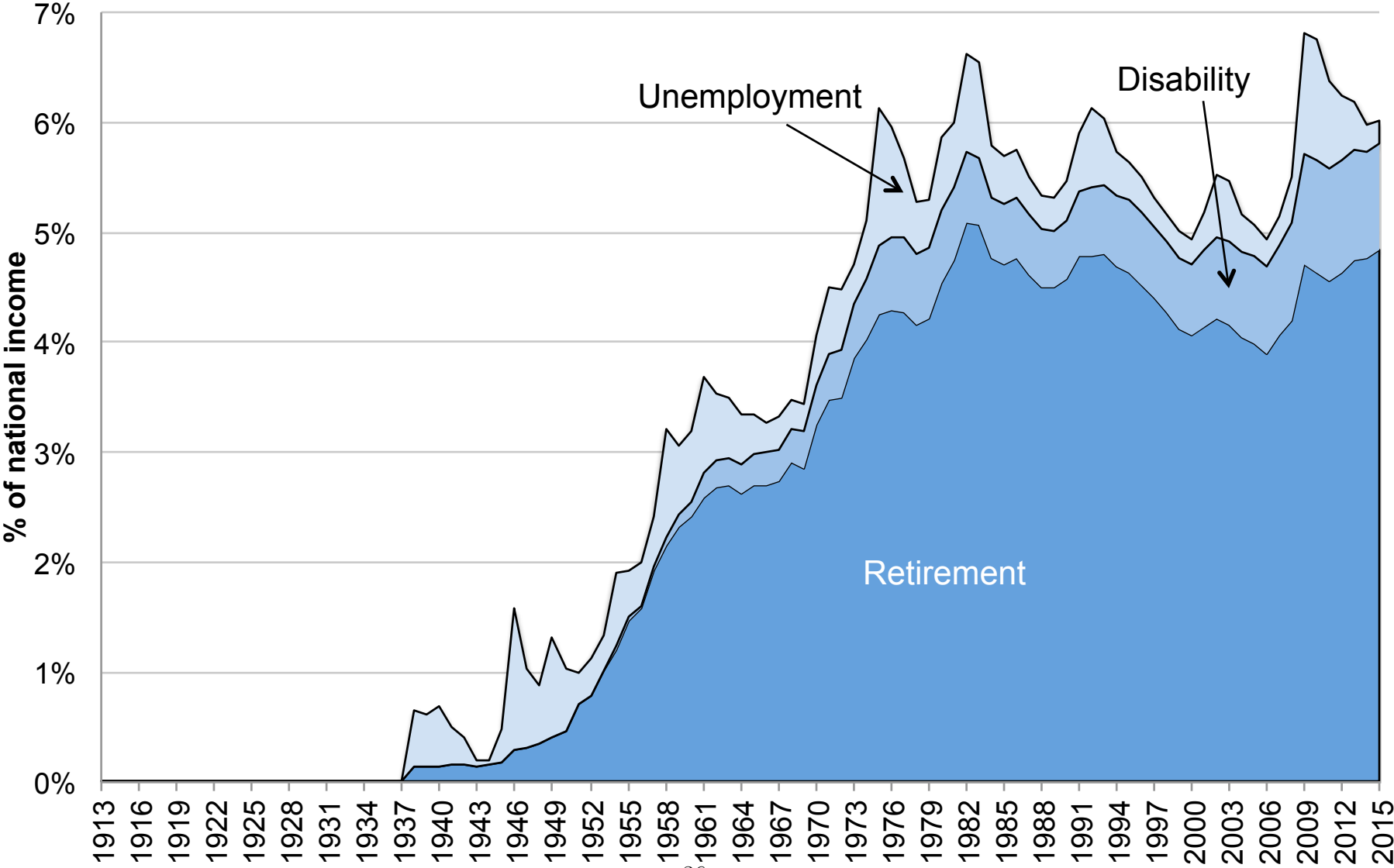
Governments tax and redistribute a big fraction of national income

- 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.

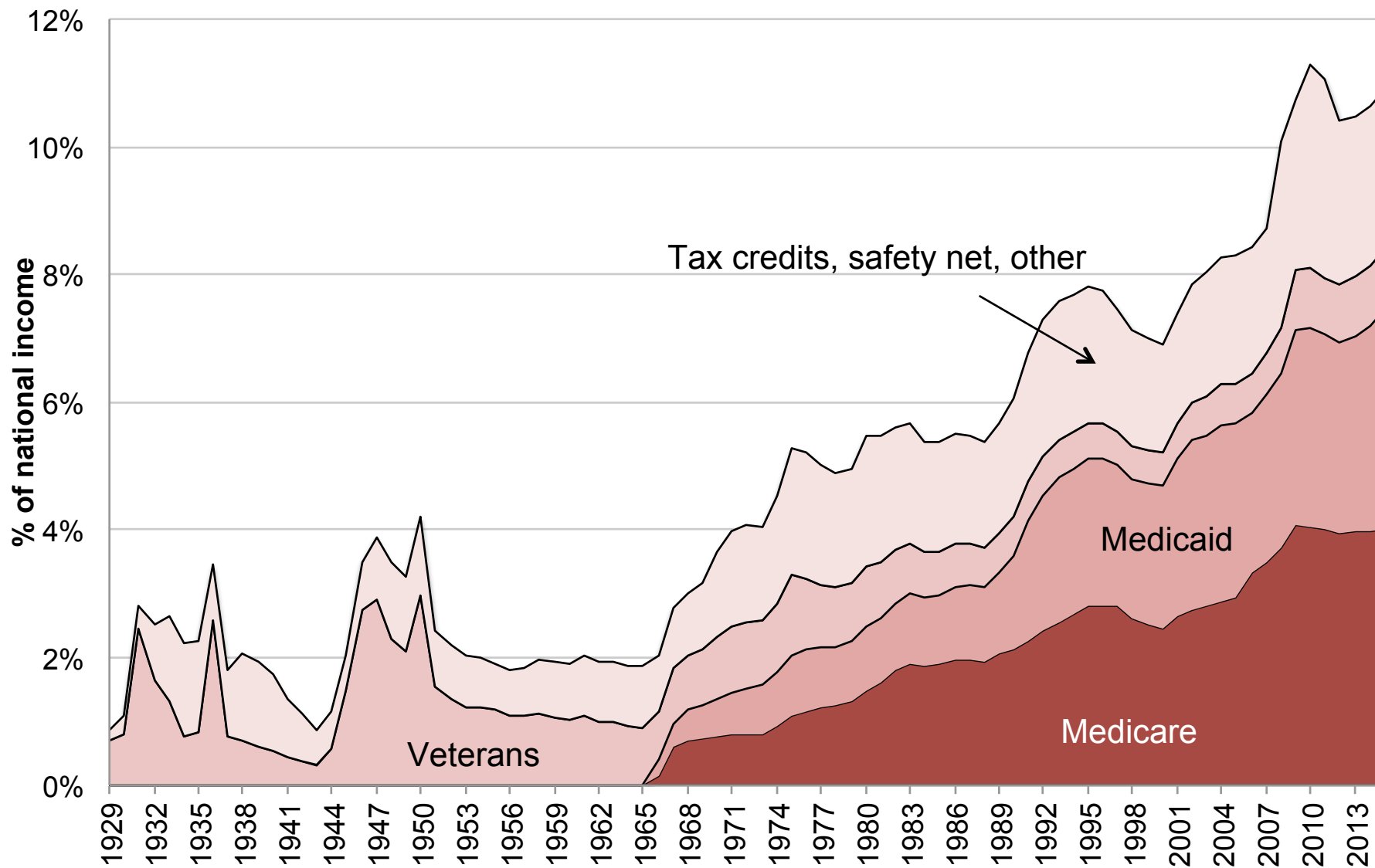
US government spending



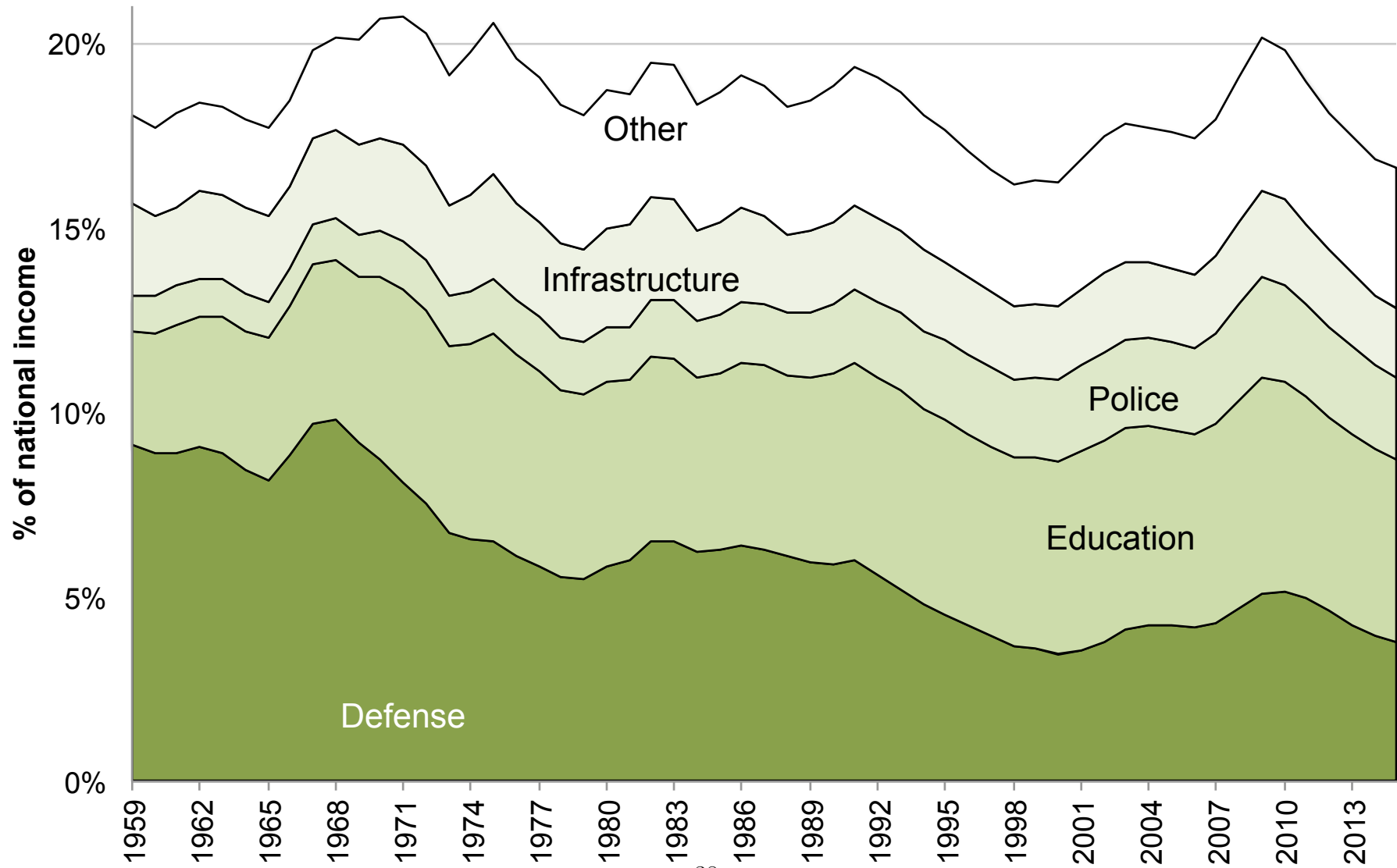
Social Security spending



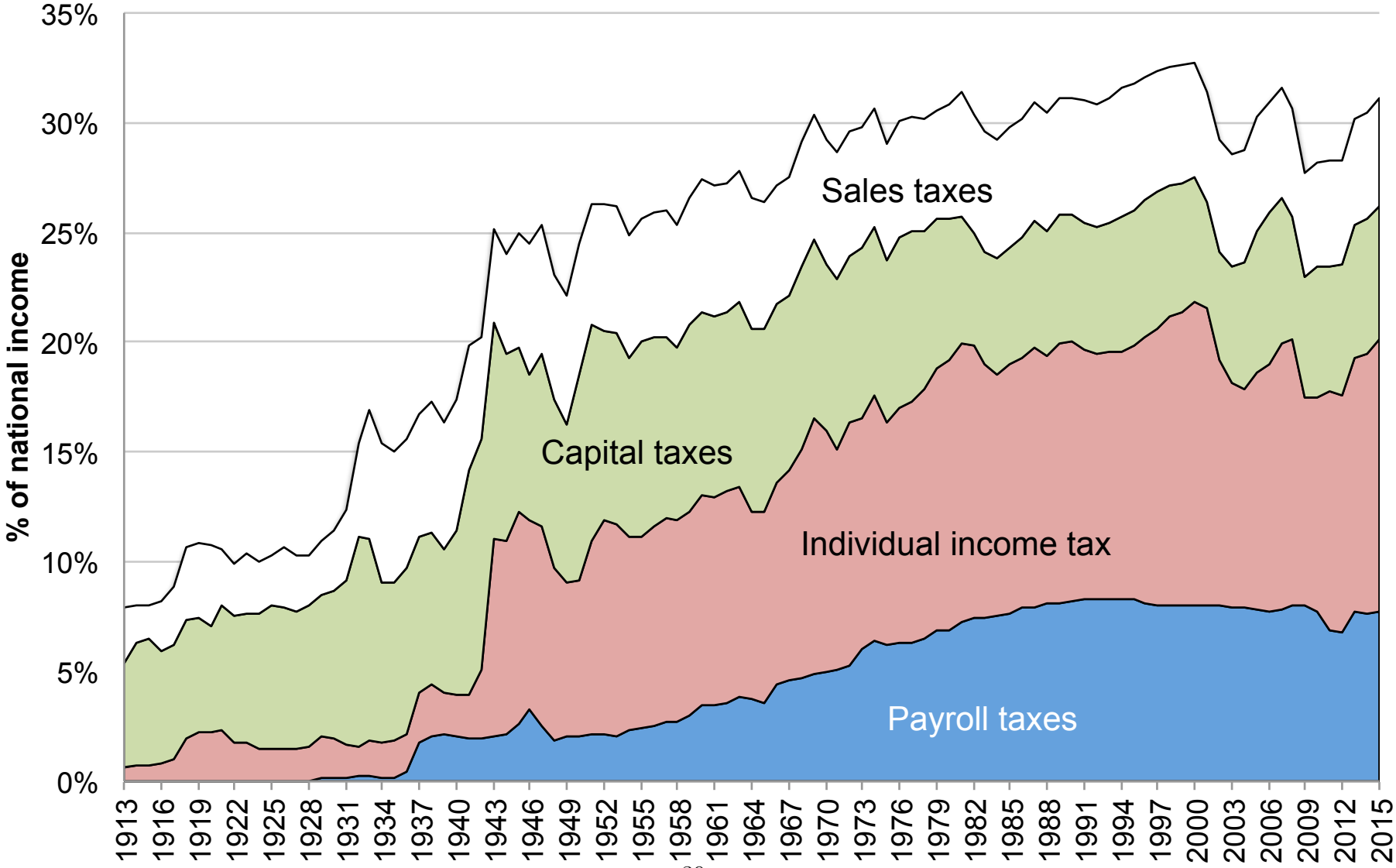
Individualized transfers (cash + in-kind)



US government collective consumption expenditure

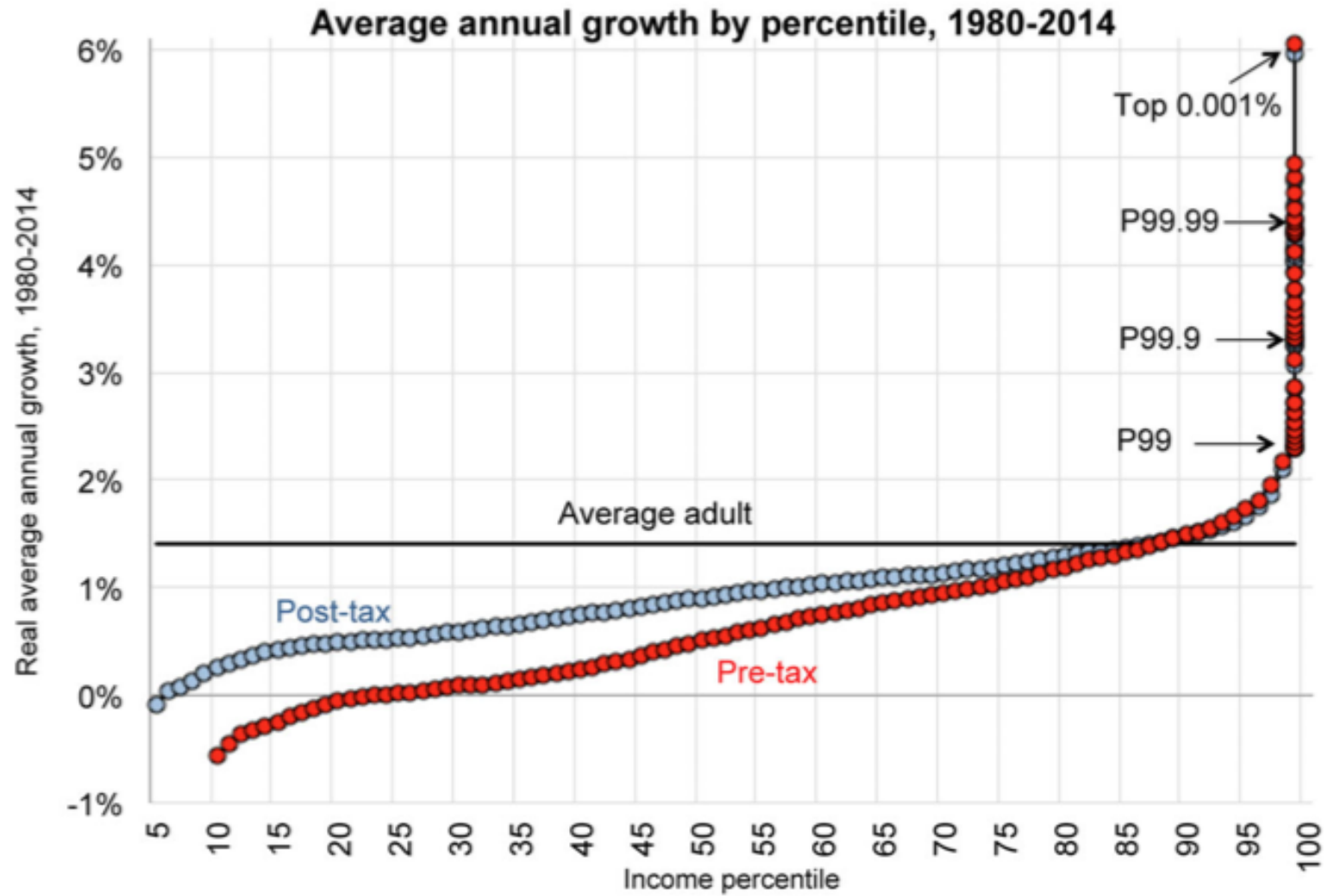


Tax revenue in the US



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

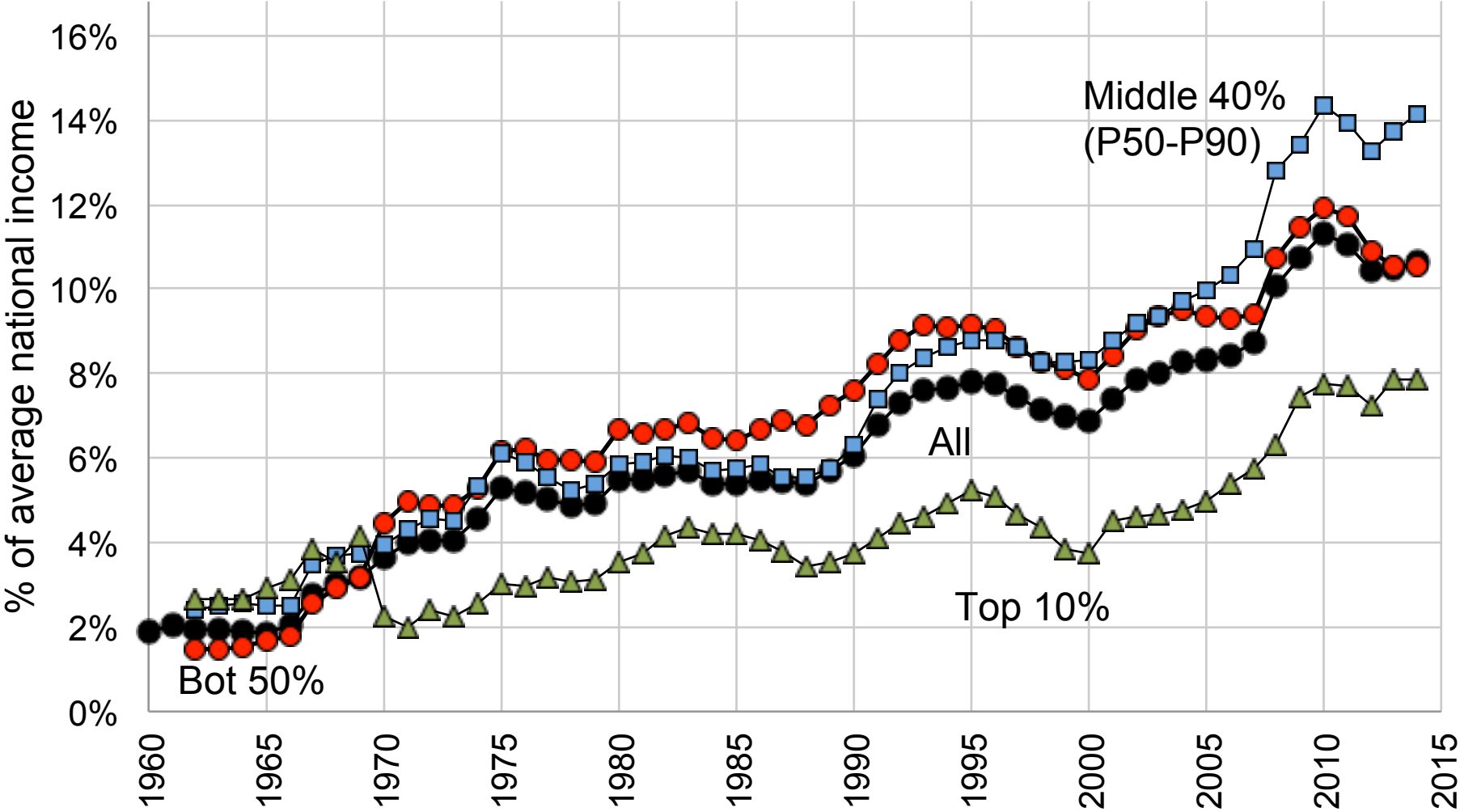


Source: Piketty, Saez and Zucman (2018).

Who receives government transfers?

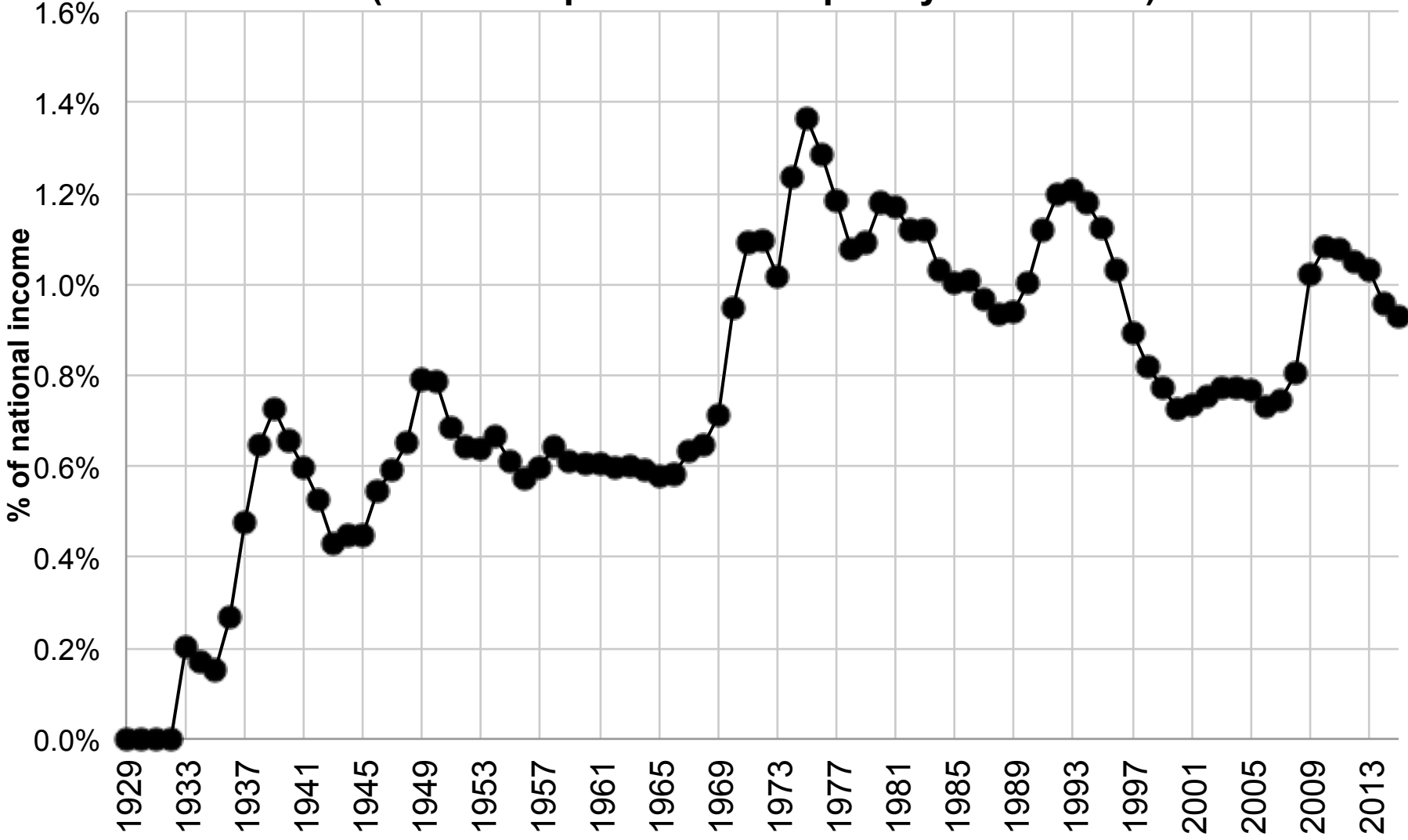
- Individualized transfers have increased a lot in the US since 1960s, because of rise in health transfers (+ Social Security)
 - Middle-class & retirees have benefited the most from this increase
 - Bottom 50% has benefited less: rise in Medicaid and EITC but collapse in safety net spending
- Overall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

Average individualized transfer by post-tax income group (excluding Social Security)



Source: Appendix Table II-G4.

Government spending on safety net (food stamps + SSI + temporary assistance)



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