Graduate Public Finance
Measuring Income and Wealth Inequality

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Lecture 12

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Outline

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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 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 $\rightarrow$ 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).

Who benefits from unbiased *TFP* growth?

1. **Production:** $Y = AF(K, L)$

$$dY = F(K, L)dA + AF_K dK + AF_L dL \tag{1}$$

$$\Delta Y = \Delta A + s_K \Delta K + s_L \Delta L \tag{2}$$

   where A is total factor productivity, ΔX denotes a percentage change in X, $s_K \equiv \frac{F_K K}{Y}$, and $s_L \equiv \frac{F_L L}{Y}$.

2. **Income:** $PY = RK + WL$

$$\Delta P + \Delta Y = s_K(\Delta R + \Delta K) + s_L(\Delta W + \Delta L) \tag{3}$$

3. **Incidence:**
   Rearranging equation (3) and substituting the expression for ΔY from equation (2) yields:

$$\Delta A = \underbrace{s_K(\Delta R - \Delta P)}_{=0 \text{ if no capital}} + s_L \underbrace{(\Delta W - \Delta P)}_{=0 \text{ if population adjusts}} \quad \Rightarrow \Delta W/P = 0 \tag{4}$$

$$\Delta A = s_K \underbrace{(\Delta R - \Delta P)}_{=0 \text{ if capital adjusts}} + s_L \underbrace{(\Delta W - \Delta P)}_{\text{Real wages}} \Rightarrow \Delta W / P = \frac{\Delta A}{s_L} \qquad (5)$$

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 → workers' revolution
- Prediction #2: Fall in rate of return to capital → infighting among capitalists (Lenin, Imperialism, the Highest Stage of Capitalism)
- Policy recommendation: communism

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 inverse-U (∩) 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

Outline

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 $y_L \to$ race between education and technology, unions, minimum wage, labor taxation ...
- Distribution of $y_K \to$ inheritance, saving rates, rates of return, capital controls, capital taxation, ...
- Factor shares $\alpha = Y_K / Y$ and $1 - \alpha \to$ technology, bargaining power, competition policy, globalization...
- Joint distribution of labor and capital income

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% pretax income share: labor vs. capital income

Capital income

Labor income
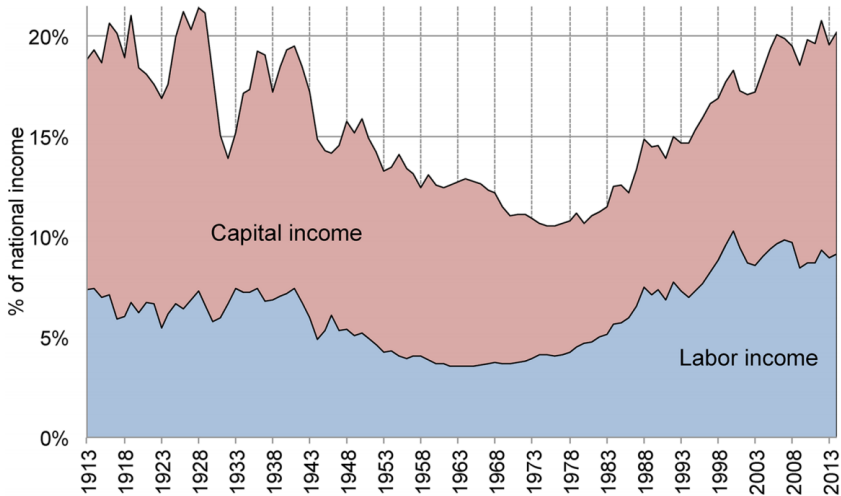
Source: Appendix Table II-B2b

FIGURE VIII

The Capital Share across the Distribution

Source: Piketty, Saez and Zucman (2018)

Measurement of Labor and Capital in PSZ (2018)

- Labor
  - Wages (includes Form 1040 wages, salaries, and tips; imputed unreported wage compensation; payroll taxes; imputed nontaxable employee benefits like employer-provided health insurance; a portion of sales and excise taxes; and a portion of pension income)
  - 30% of mixed income (i.e., partnership and sole prop income, which includes imputed unreported business income, a portion of sales and excise taxes, and a portion of corporate taxes)
  - 0% of S-corporation income
- Capital
  - 100% of S-corporation income plus C-corp dividends and imputed retained earnings (which includes a portion of sales and excise taxes, and a portion of corporate taxes)
  - Other capital income (includes interest, imputed underreported interest income, rents, imputed rental income (including imputed rent from owner-occupied housing), a portion of sales and excise taxes, and a portion of pension income)

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 limits of top income share studies:

Limit 1: fiscal income data (i.e., income on tax returns) miss a large and growing fraction of income $\rightarrow$ large disconnect between inequality and macro
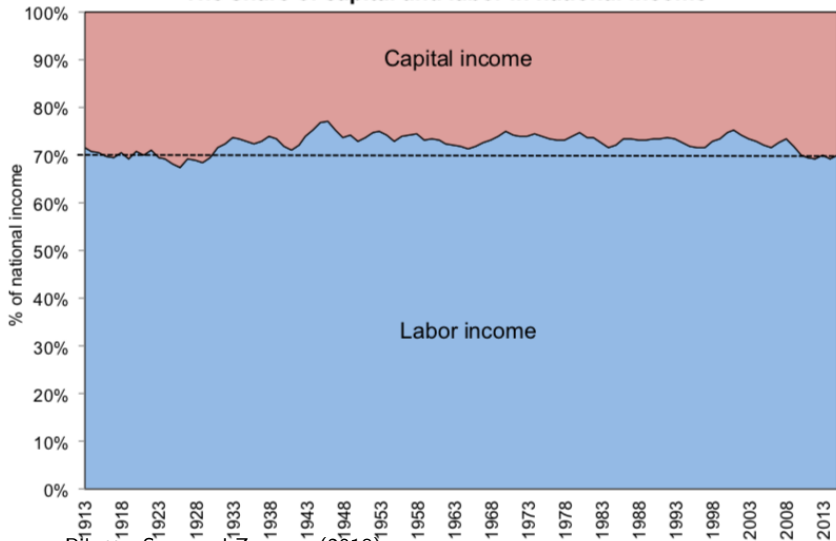
- In all countries, miss most capital income (tax exempt; tax evasion); sometimes miss some labor income too
- Implies substantial uncertainty on level and trend of inequality

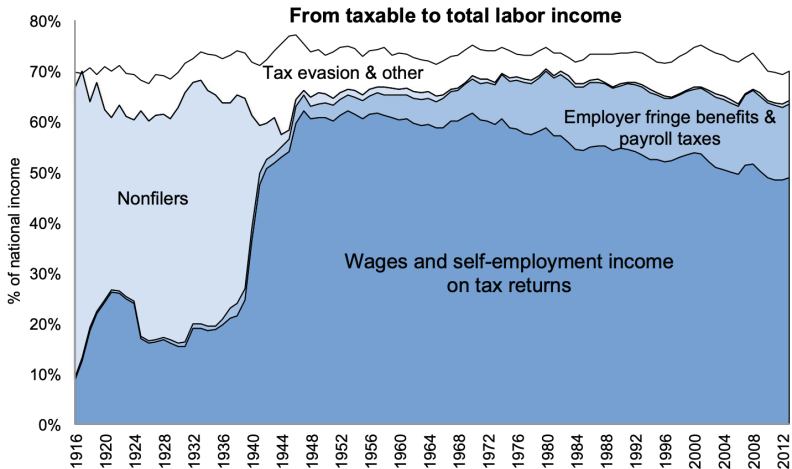Limit 2: silent about distribution of after-tax-and-transfer income

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

Also assessing current approaches and coming up with new ways to overcome missing data issues
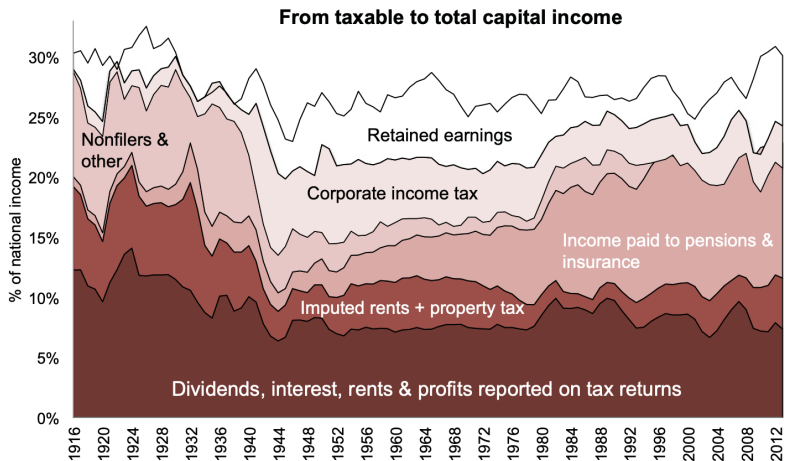
The share of capital and labor in national income

Source: Piketty, Saez and Zucman (2018)

From taxable to total labor income

Tax evasion & other

Nonfilers

Employer fringe benefits & payroll taxes

Wages and self-employment income on tax returns

% of national income

Source: Appendix Table I-S.A8b.

Source: Piketty, Saez and Zucman (2018)

From taxable to total capital income

Nonfilers & other

Retained earnings

Corporate income tax

Income paid to pensions & insurance

Imputed rents + property tax

Dividends, interest, rents & profits reported on tax returns

Source: Appendix Table I-S.A8.

Source: Piketty, Saez and Zucman (2018)

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1. History of thought on 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

5. Smith Yagan Zidar Zwick (2018)
   - Fiscal Income and Imputed National Income
   - Imputed National Income: Methodology for Retained Earnings

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)
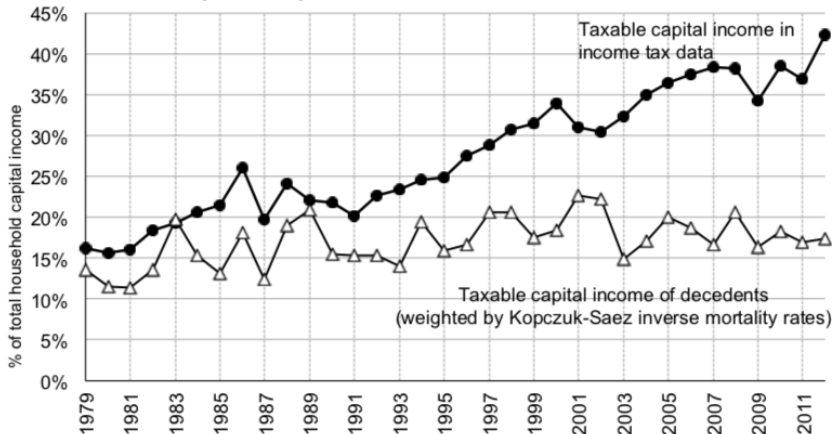
Limits of estate multiplier method

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

Taxable capital income in income tax data

Taxable capital income of decedents (weighted by Kopczuk-Saez inverse mortality rates)

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
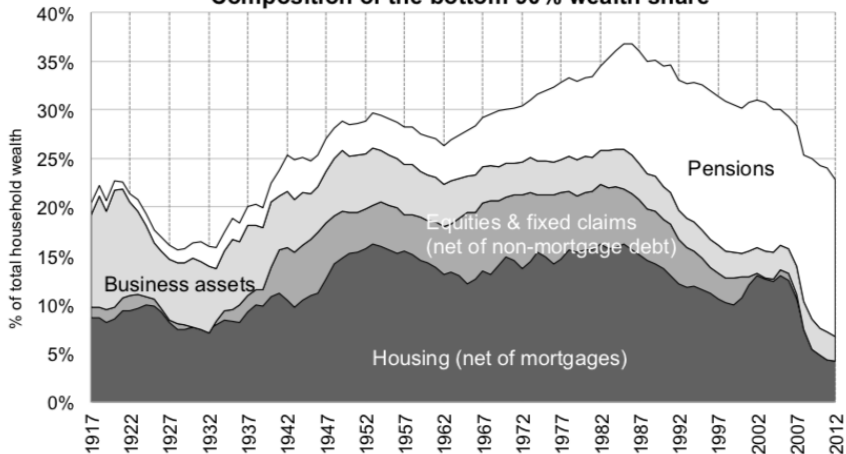
More on this later in the slides

Top 0.1% wealth share in the United States, 1913-2012
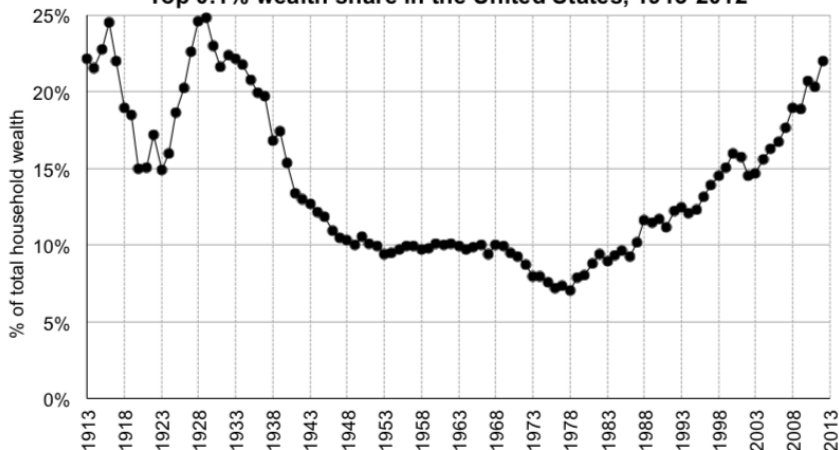
This figure depicts the share of total household wealth held by the 0.1% richest families, as estimated by capitalizing income tax returns. In 2012, the top 0.1% includes about 160,000 families with net wealth above $20.6 million. Source: Appendix Table B1.
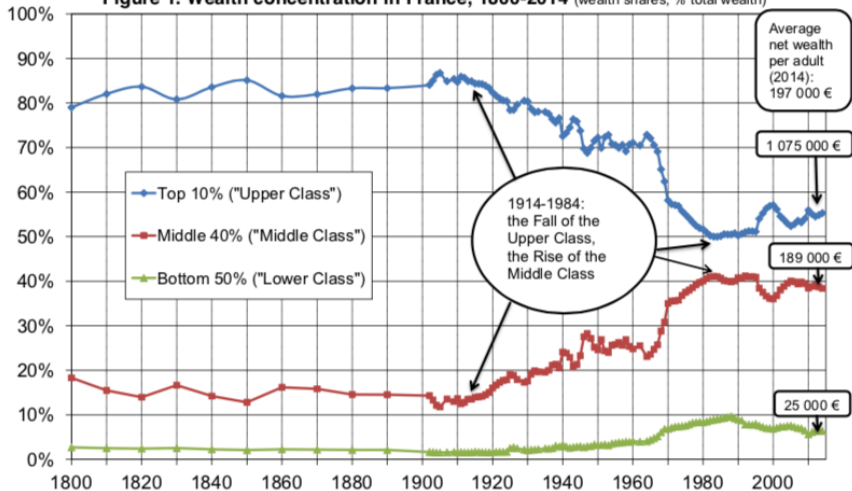
Source: Saez and Zucman (2016)

Composition of the bottom 90% wealth share

Pensions

Equities & fixed claims
(net of non-mortgage debt)

Business assets

Housing (net of mortgages)

Source: Saez and Zucman (2016)

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

Source: Garbinti, Goupille, Piketty (2017)

Outline

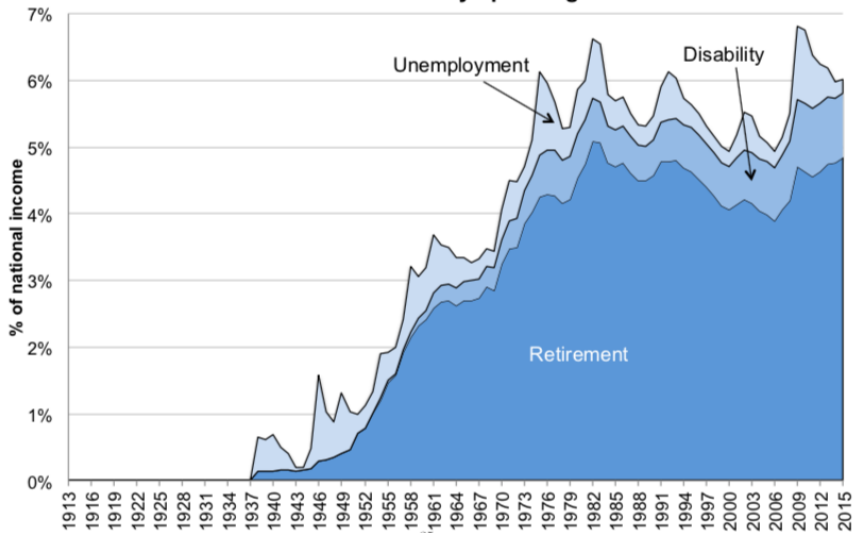# 4. The effect of taxes and transfers on inequality

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
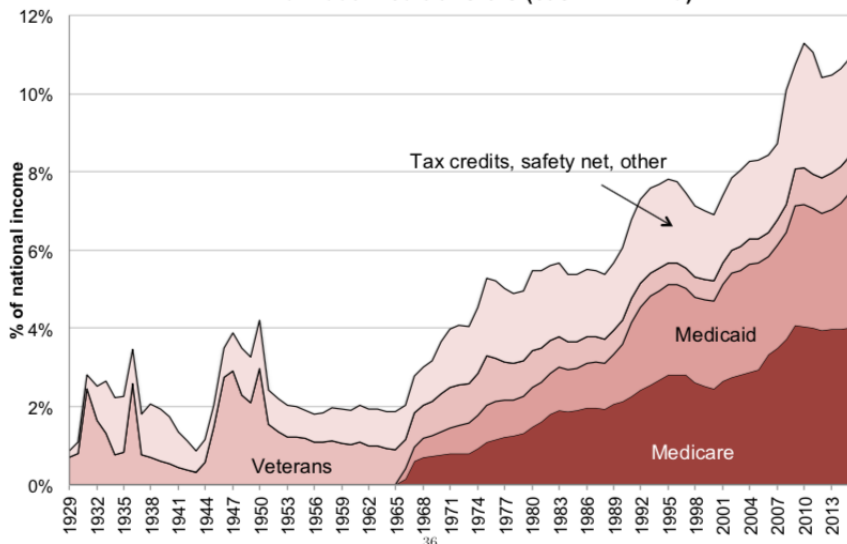- Strong correlation between development and size of gov.
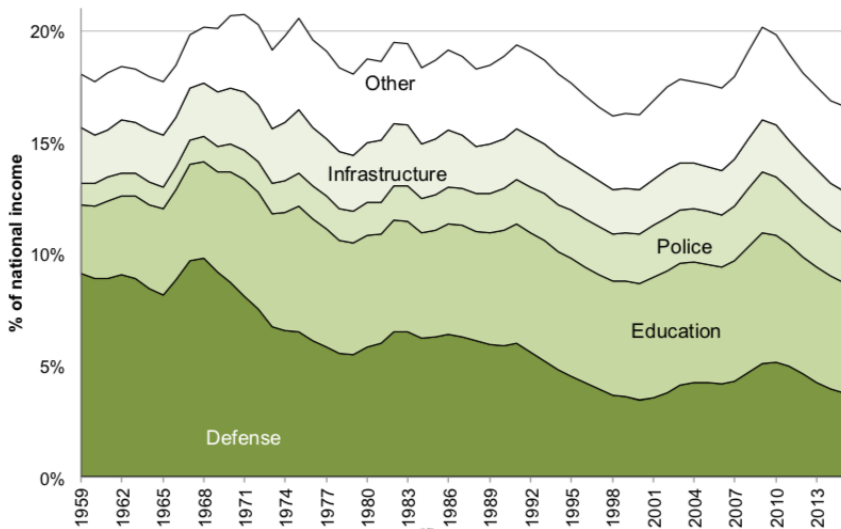
US government spending

Collective consumption expenditure
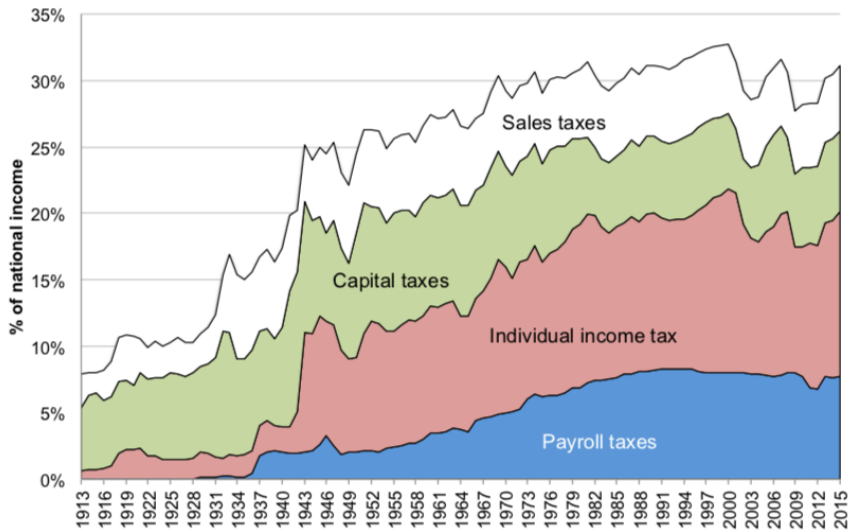
Individualized transfers (cash + in-kind)
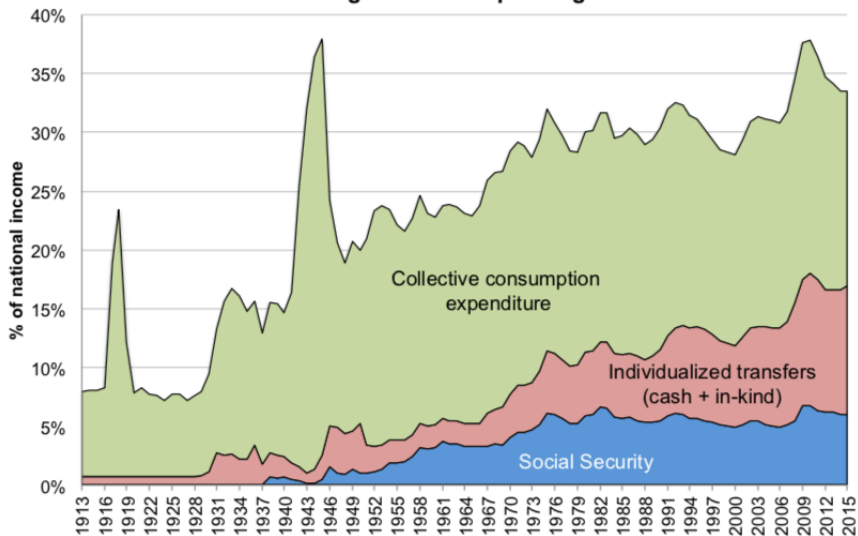
Social Security

Social Security spending

Individualized transfers (cash + in-kind)

36

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, by tax type, 1913–2015)

- Sales taxes
- Capital taxes
- Individual income tax
- Payroll taxes

Post-tax vs. pre-tax inequality

Governments tax and redistribute a big fraction of national income

- Denote z pre-tax income, $y = zT(z) + B(z)$ 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

Average annual growth by percentile, 1980-2014

Top 0.001%

Average adult

Post-tax

Pre-tax

Real average annual growth, 1980-2014

Income percentile
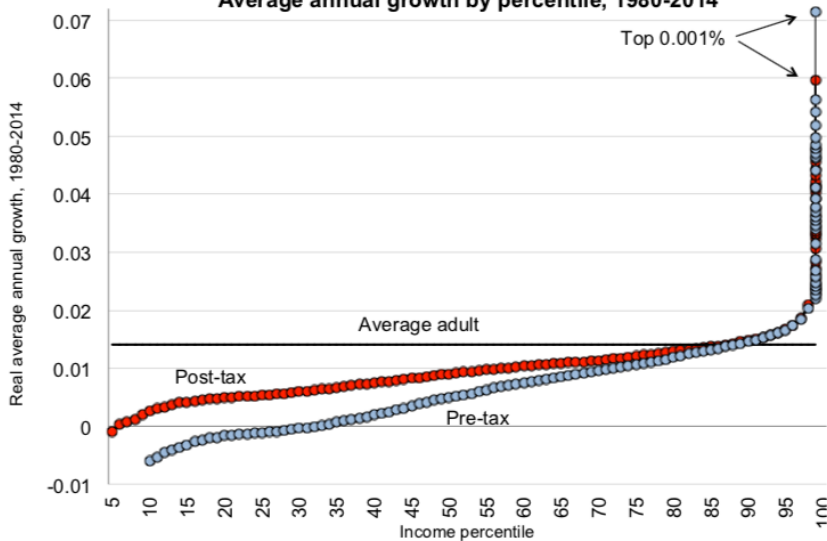
Source: Piketty, Saez and Zucman (2016).

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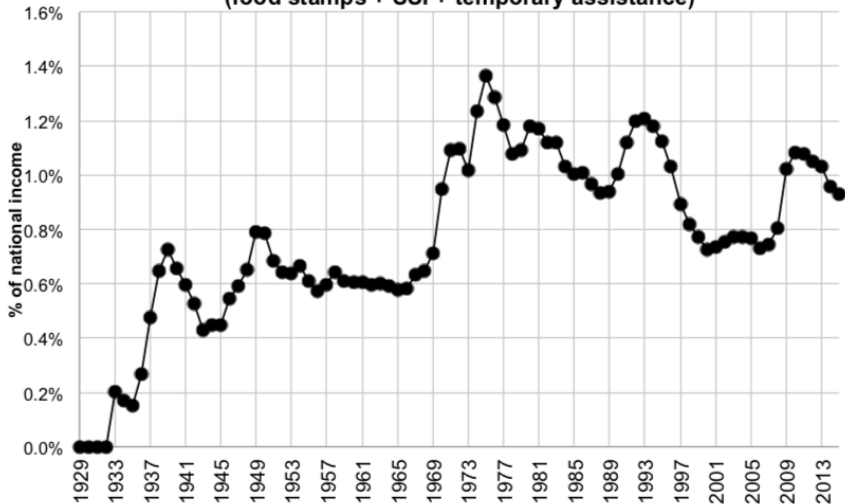
$\rightarrow$ Overall bottom 50% receives less transfers than middle class today

Average individualized transfer by post-tax income group (excluding Social Security)
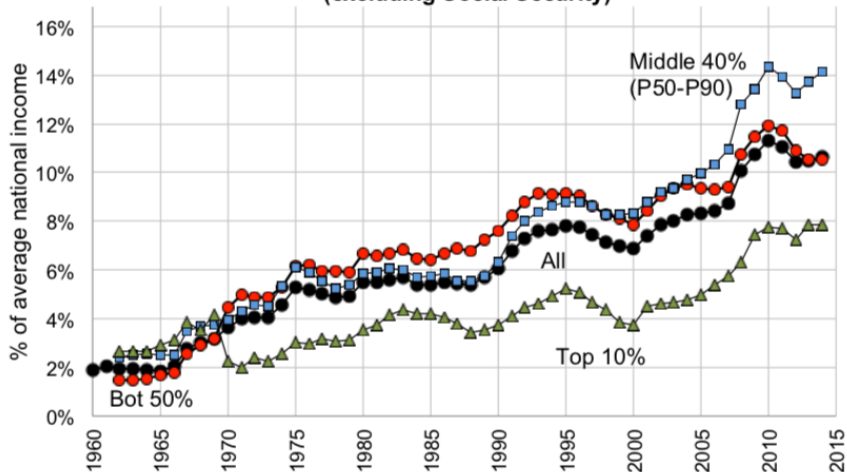
Source: Appendix Table II-G4.

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

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Two definitions of income

1. Fiscal income (Piketty and Saez 2003)

- Form 1040 total income minus realized capital gains
- Tax unit level of observation
- **Pro:** Directly observed, well understood
- **Con:** Missing non-taxable income, sensitive to tax rules

2. Imputed national income (Piketty, Saez, and Zucman 2018)

- Fiscal income + imputed missing elements
  - Capital: retained earnings, owner-imputed rents, pension income
  - Labor: health insurance
  - Other: taxes and transfers (we focus on pre-tax, pre-transfer version)
- Individual level of observation
- **Pro:** Sums to national income
- **Con:** Relies on imputation assumptions, hard to replicate