Inequality, Poverty, Taxes and Transfers

(loosely follows Gruber Chapter 17)

ECON 3003
Advanced Public Economics

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Recall: Two General Rules for Government Intervention

1) Market Failures: Government intervention can alleviate them

2) Redistribution: Free market generates inequality. Public cares about economic disparity. Govt taxes and spending can reduce inequality

Role 2: Redistribution

Even with no market failures, free market outcome might generate substantial **inequality**

Inequality matters because humans are social beings: people evaluate their economic well-being relative to others, not in absolute terms ⇒ Public cares about inequality

In advanced economies, people pool 30-50% of their income through their government to fund many transfer programs

Do taxes and transfers affect economic behavior?

⇒ Generates an **efficiency and equity trade-off** (size vs. distribution of the economic pie)

Income Inequality: Labor vs. Capital Income

Economic production happens with labor and capital

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

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 institutions (minimum wage, unions, etc.)

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

Capital Income (or wealth) is much more concentrated than Labor Income. See the World Inequality Report (2022)

Macro-aggregates: Labor vs. Capital Income

National Income = GDP − depreciation of capital + net foreign income. For example, in the US:

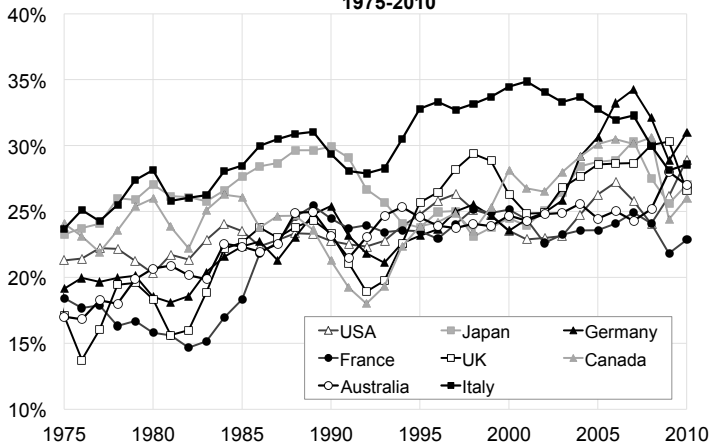Labor income $wl \simeq 75\%$ of national income z

Capital income $rk \simeq 25\%$ of national income z (and increasing)

Private wealth $k \simeq 500\%$ of national income z (and increasing)

Rate of return on wealth $r \simeq 5 - 6\%$

Private wealth has increased while public wealth has declined

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

Source: Piketty and Zucman (2014)

Nations have become richer, but govts have become poor

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

Y-axis: Wealth as as % of national income

Legend: Spain, USA, France, Japan, UK, Germany

Private wealth
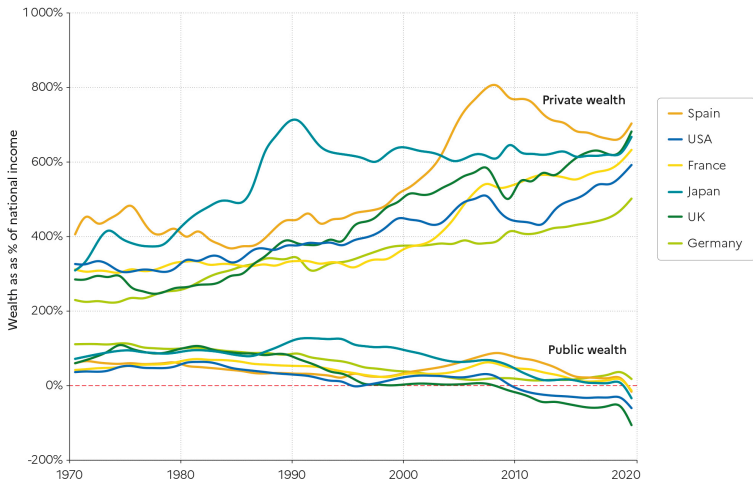
Public wealth

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

Capital Income (or wealth) is always more concentrated than Labor Income. In the United States:

Top 1% wealth holders have almost 40% of total private wealth (Saez-Zucman 2016). Bottom 50% wealth holders hold almost no wealth.

Top 1% incomes earn about 20% of total national income on a pre-tax basis (Piketty-Saez-Zucman, 2018)

Top 1% labor income earners have about 15% of total labor income

World Inequality Lab (wid.world) provides standardized statistics for many countries and worldwide

Income and wealth inequality are pretty similar for the World as a whole and within the US

Figure 1.1 *Global income and wealth inequality, 2021*
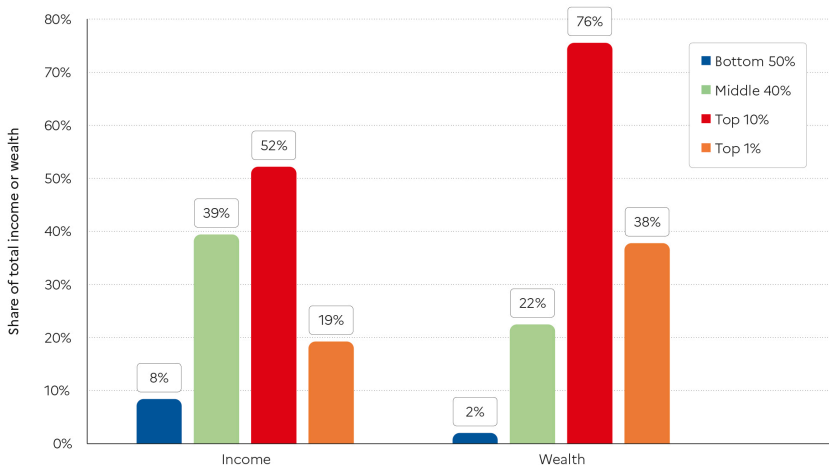
Interpretation: The global 50% captures 8% of total income measured at Purchasing Power Parity (PPP). The global bottom 50% owns 2% of wealth (at Purchasing Power Parity). The global top 10% owns 76% of total Household wealth and captures 52% of total income in 2021. Note that top wealth holders are not necessarily top income holders. Income is measured after the operation of pension and unemployment systems and before taxes and transfers. *Sources and series:* wir2022.wid.world/methodology

Top 1% of the world's population owns 38% of total wealth

Source: *https://wir2022.wid.world/*
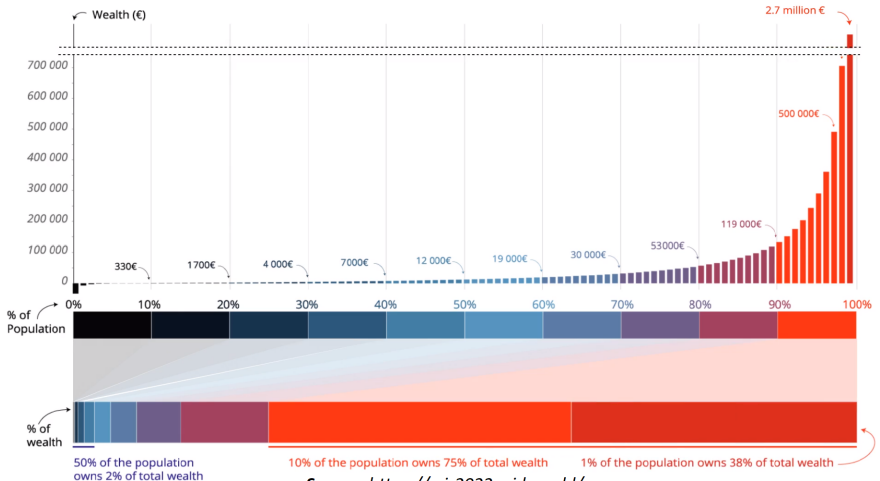
Income Inequality Measurement

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

Most famous inequality index: **Gini coefficient**

Gini $= 2 \times$ 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

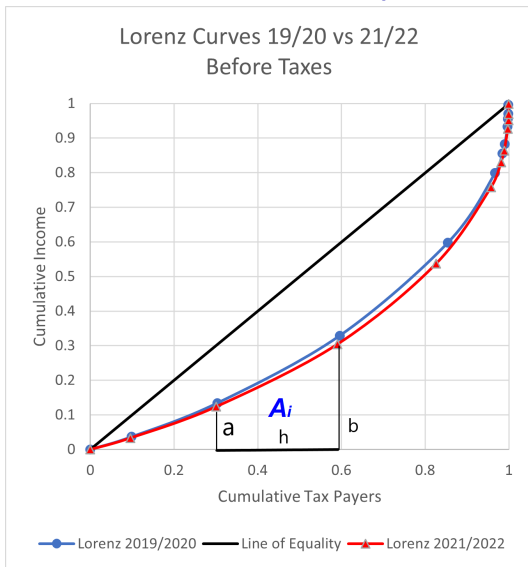**Gini=1** means complete inequality (top person has all the income)

With fiscal tabulations: use formula of a trapezoid, $h \times [(a+b)/2]$, with height h and bases a and b, to calculate partitions under the Lorenz curve A_i; then sum these areas $A = \sum_i A_i$, then Gini $= \frac{0.5 - A}{0.5}$

Tutorial 1: Example
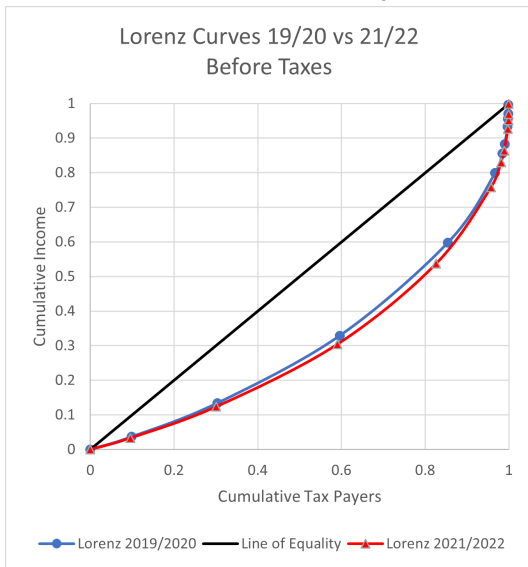
Source: Own elaboration based on UK fiscal tabulations.

Tutorial 1: Example

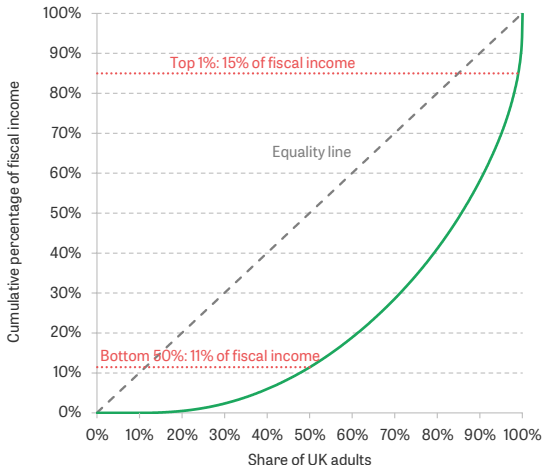Source: Own elaboration based on UK fiscal tabulations.

Poll: Income share of the top 1%

How much income does the richest 1% concentrate in the UK?

Results here: (link)

Figure 1. Cumulative distribution of UK fiscal income, 2018–19

Note: The graph shows the cumulative distribution of fiscal income (as described in Section 2) for UK adults, defined as individuals aged 18 and over. The grey dashed line shows an income distribution in which all adults have the same level of fiscal income.
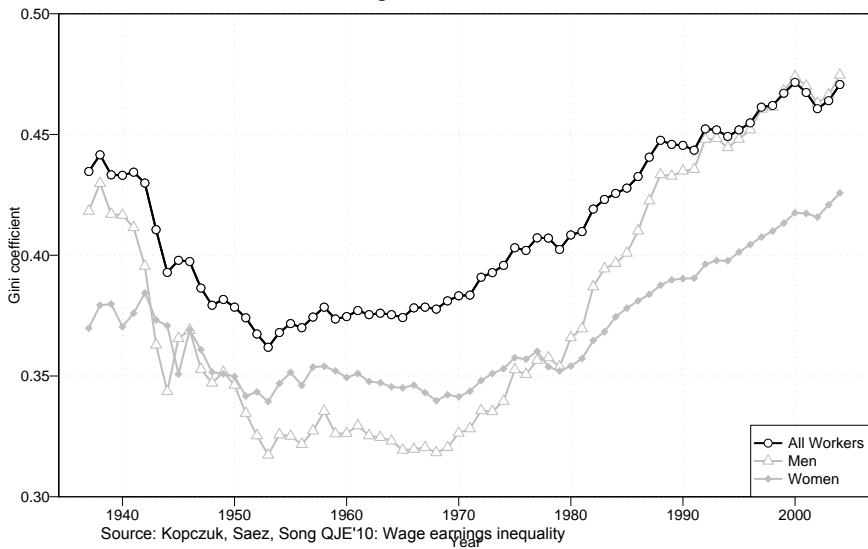
Source: Delestre et al (2022)

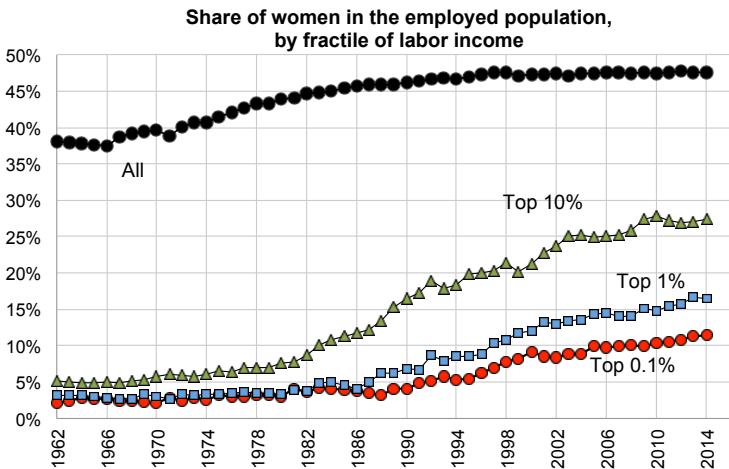Source: Survey of Personal Incomes 2018–19.

Key Empirical Facts on Income Inequality

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

2) Gender gap decreased but remains substantial especially at the top

3) In the US, top income shares dropped dramatically from 1929 to 1950 and increased dramatically since 1980

4) Bottom 50% pre-tax income per adult have stagnated since 1980 in spite of a 60% increase in average national income

5) 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, not as much in Continental Europe and Japan [Atkinson, Piketty, Saez JEL'11]
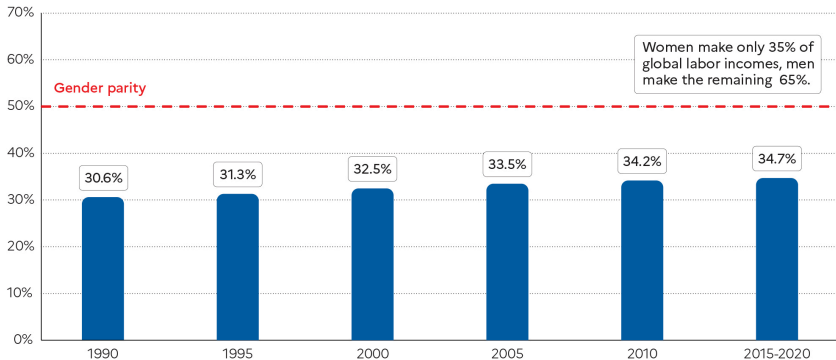
Figure 1: Gini coefficient

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

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

Share of women in the employed population, by fractile of labor income

All

Top 10%

Top 1%

Top 0.1%

Source: Appendix Table II-F1.

Figure 12 *Female share in global labor incomes, 1990-2020*

The chart shows a bar graph titled with a y-axis from 0% to 70%.

- Gender parity line at 50% (red dashed)
- Callout box: "Women make only 35% of global labor incomes, men make the remaining 65%."

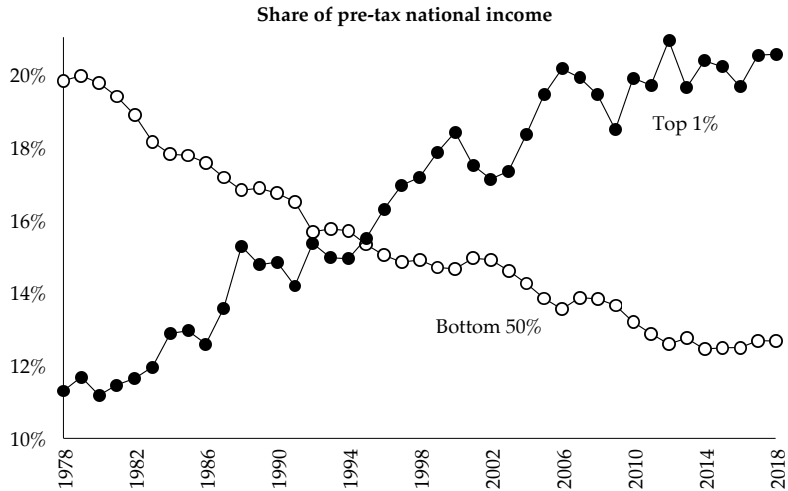| Year	Female share
1990	30.6%
1995	31.3%
2000	32.5%
2005	33.5%
2010	34.2%
2015-2020	34.7%

Interpretation: *The share of female incomes in global labour incomes was 31% in 1990 and nears 35% in 2015-2020. Today, males make up 65% of total labor incomes.* **Sources and series:** *wir2022.wid.world/methodology and Neef and Robilliard (2021).*
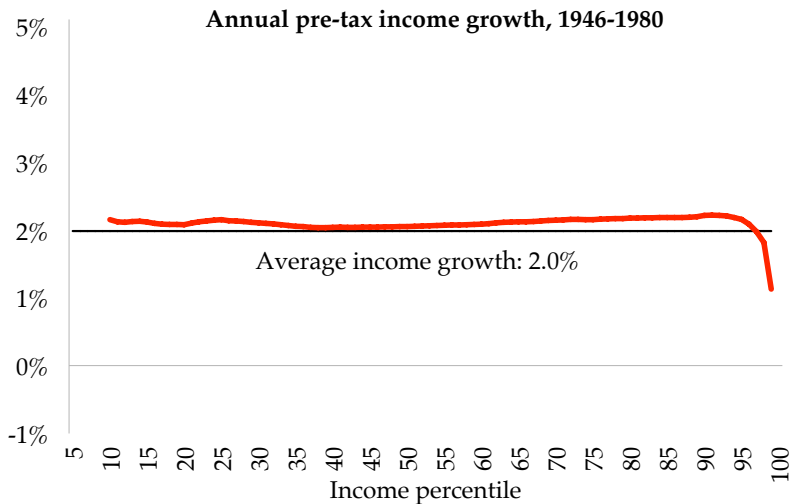
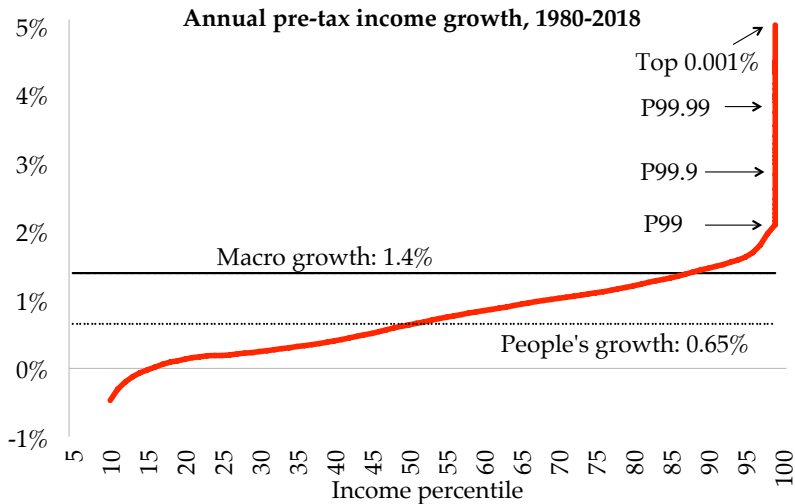**Top 10% Pre-tax Income Share in the US, 1913-2018**
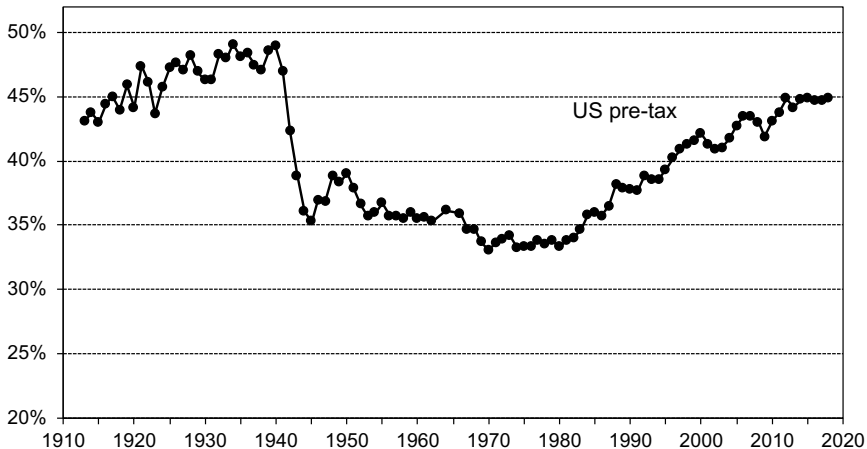
US pre-tax

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).

Share of pre-tax national income

Top 1%

Bottom 50%

Source: Saez and Zucman (2019), Figure 1.1

Annual pre-tax income growth, 1946-1980

Average income growth: 2.0%

Income percentile

Annual pre-tax income growth, 1980-2018

Top 0.001%

P99.99 →

P99.9 →

P99 →

Macro growth: 1.4%

People's growth: 0.65%

Income percentile

Top 10% Income Shares Across Countries
Pre-tax National Income, equal-split adults

Source: WID.world

Top 10% Income Shares Across Countries
Pre-tax National Income, equal-split adults
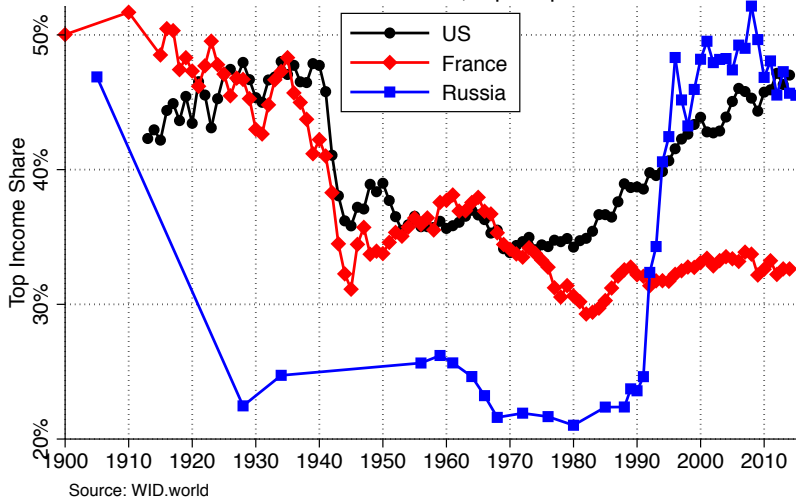
Source: WID.world

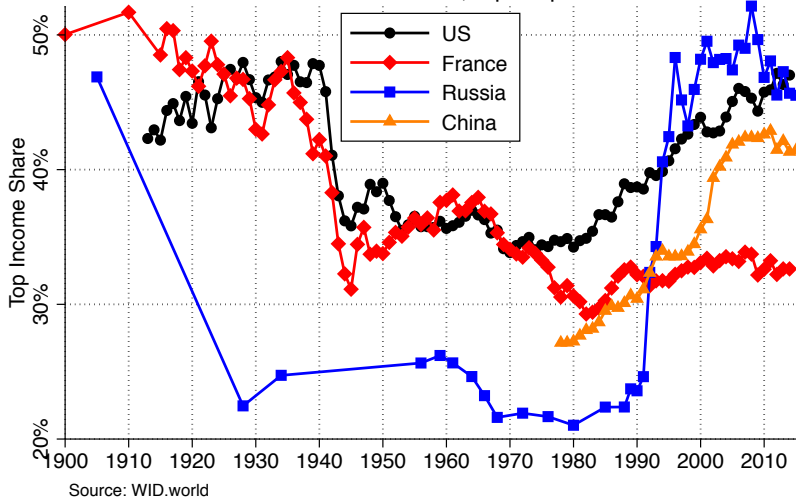Top 10% Income Shares Across Countries
Pre-tax National Income, equal-split adults

Source: WID.world

Top 10% Income Shares Across Countries
Pre-tax National Income, equal-split adults
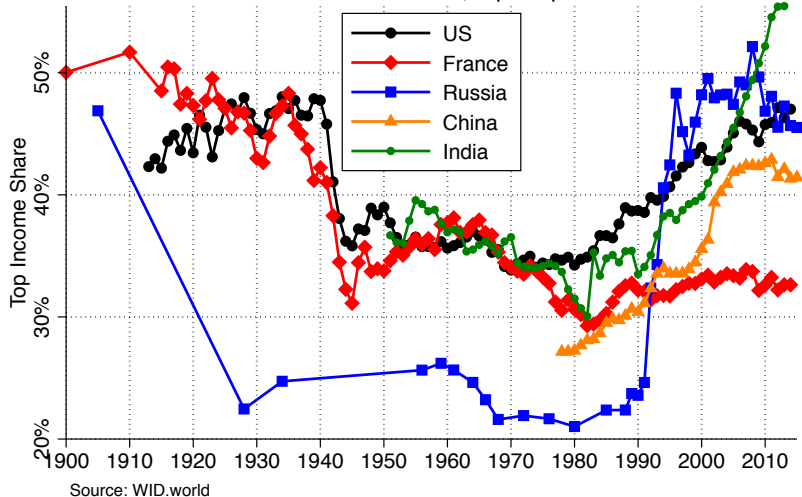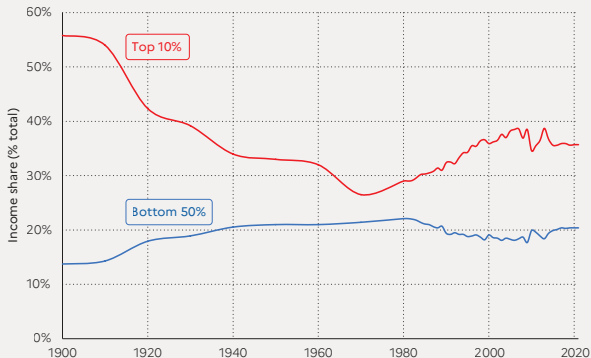
Source: WID.world

Inequality in the UK

1) UK was one the most unequal countries in the early 20th century

2) The military and economic shocks of the 1910-1940s and decolonization processes hit top incomes hard

3) The neoliberal turnaround of the early 1980s led to a significant increase in the top 10% share by around 10 p.p.

4) 2008 financial crisis slowed the increase; also depressed avg incomes

5) Wealth ineq strongly declined over the 20th century (1910-1980). Reversed since mid-1980s but the rise has been slower than for income

6) The female labor income share is equal to 38%. Exhibits a significant increase since 1990, with a gain of 8 pp over 30 years

Income inequality in the long run

Figure 1: Top 10% and bottom 50% income shares in the United Kingdom, 1900-2021
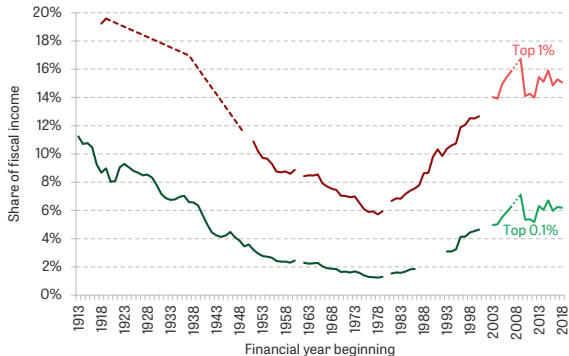
Interpretation: The Top 10% income share is equal to 36% in 2021. Income is measured after the operation of pensions and unemployment insurance systems and before income tax.
Sources and series: see wir2022.wid.world/methodology, and Chancel and Piketty (2021).

Income inequality in the long run – Richest 1% and 0.1%


Figure 2. UK top income shares over time

Note: The graph shows the share of aggregate fiscal income flowing to the top 1% and 0.1% of UK adults between 1913–14 and 2018–19. Figures prior to 2003–04 are taken from table 4.1 in Atkinson (2007) and measure top income shares using administrative records of the 'super tax' introduced on high incomes in 1909. The paler coloured series show our calculations of the same percentile shares using the Survey of Personal Incomes. These differ in two important respects from those of Atkinson (2007). First, the definition of income used by Atkinson (2007) is inclusive of pension contributions and taxable state benefits, both of which are excluded from our definition of fiscal income. Second, the Atkinson (2007) series uses an external denominator derived from the UK national accounts, while our series uses an internal denominator comprising all fiscal income observed in the SPI. See footnote 16 for a discussion of alternative methodologies.

Source: Delestre et al (2022)

Source: Survey of Personal Incomes, various years; Atkinson, 2007.

A strong decline in wealth inequality
in the 20th century followed by a slow rise

Figure 2: *Wealth distribution in the United Kingdom*
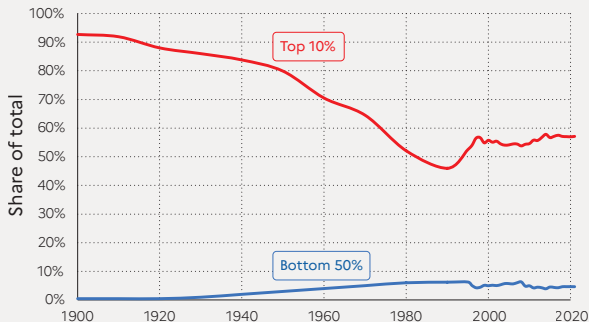
Interpretation: In 2020, the wealthiest 10% of the population own 57% of total household wealth. Household wealth is the sum of all financial assets (e.g. stock, bonds) and non-financial assets (e.g. housing), net of debts.
Sources and series: wir2022.wid.world/methodology.

Female labor income share in the United Kingdom, 1990-2020

Figure 3: *Female labor income share in the United Kingdom, 1990-2020*
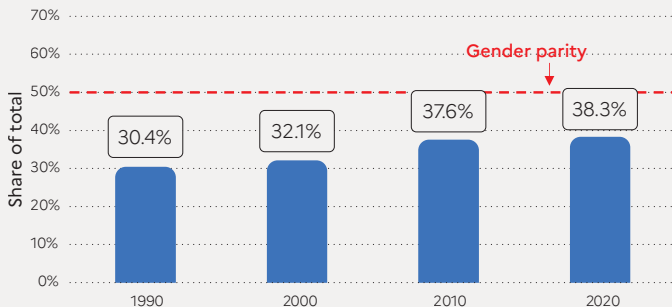
Interpretation: *The share of total labor income accruing to women in 2020 is close to 38%.*
Source and series: *wir2022.wid.world/methodology.*

Recent Inequality Trends in the UK

OECD figures suggest that the UK has among the highest levels of income inequality in the EU (as measured by the Gini coefficient), although income inequality is lower than in the US

1) Today's Gini is much higher than the level at the end of the 1970s

2) Remarkably stable in 2020–21 despite the huge disruption of COVID

3) The middle of the income distribution had $\sim$2x the income of the 10th ptile in 2020–21, and the 90th ptile had $\sim$2x that of the middle

4) Neither of these statistics has substantially changed since the early 1990s, in both cases fluctuating between 1.9 and 2.1

Gini coefficient for disposable household income, 1978 to 2021
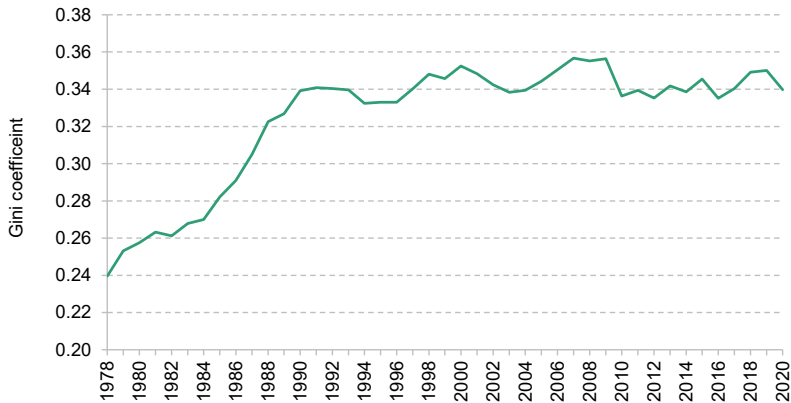
Note: Incomes have been measured net of taxes and benefits and before housing costs have been deducted. All incomes have been equivalised using the modified OECD equivalence scale.

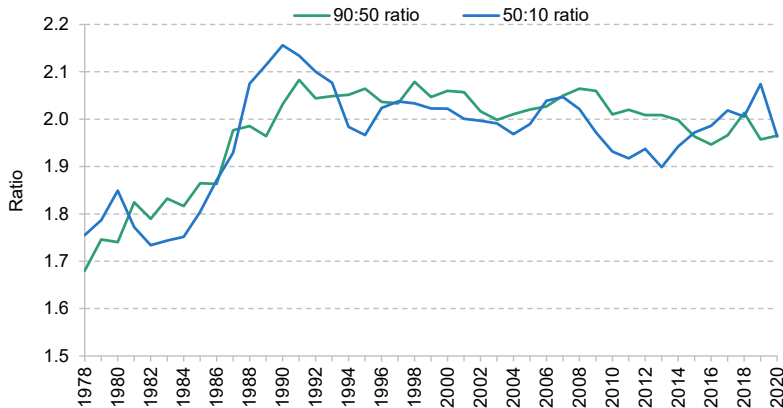# 90:50 and 50:10 ratios for disposable household income, 1978 to 2021

Source: Cribb et al (2022). IFS Report R215

Note: Incomes have been measured net of taxes and benefits and before housing costs have been deducted. All incomes have been equivalised using the modified OECD equivalence scale.

Poverty Rate Measurement

1. **Absolute:** Fraction of population with disposable income (normalized by family size) below **poverty threshold z^* fixed in real terms** (e.g., World Bank uses \$1.90/day in 2011 dollars)

2. **Relative:** Fraction of population with disposable income (normalized by family size) below **poverty threshold z^* fixed relative to median** (European Union uses 60% of median)

Absolute poverty falls in the long run with economic growth [nobody in the US is World Bank poor] but **relative poverty** does not

Absolute poverty captures both growth and inequality effects while **relative poverty** captures only inequality effects

The fact that inequality stays in the debate in spite of huge growth since 1800 shows that relative income is the relevant concept

$\Rightarrow$ Health measures (mortality, stunting) are the only relevant absolute measures of deprivation in the long-run

FIGURE 1.3 Number of Extreme Poor by Region, 1990–2030
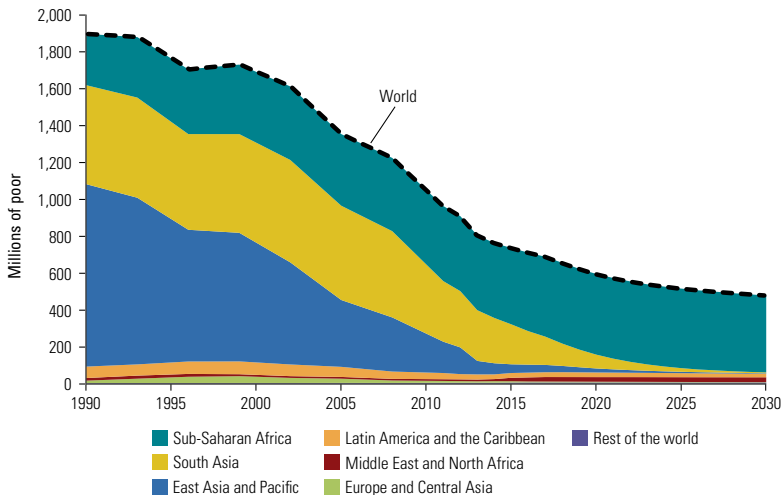
Source: PovcalNet (online analysis tool), http://iresearch.worldbank.org/PovcalNet/. World Bank, Washington, DC, World Development Indicators; World Economic Outlook; Global Economic Prospects; Economist Intelligence Unit.

Poll: What's the poverty rate in the UK?

What percent of people live in absolute poverty in the UK?

Results here: (link)

UK Poverty Rate Definition

- **Absolute poverty:** people in absolute low income – living in households with income below 60% of (inflation-adjusted) median income in some base year, usually 2010/11
- **Relative poverty:** people in relative low income – living in households with income below 60% of the median in that year

Around 1 in 6 people in the UK are in relative low income before housing costs (BHC), rising to around 1 in 5 once we account for housing costs (AHC)

UK: absolute poverty has fallen substantially; relative poverty increased and remained relatively constant lately

US: strikingly, absolute poverty rate has hardly fallen since 1970 despite huge economic growth in 50+ years

Facts on UK Income Poverty

1. **Absolute poverty** fell by 1 pp to 17%, continuing the declining trend seen in recent years
2. The drop was especially large for children and pensioners
3. Pensioners less likely to be exposed to labour market shock; families with children more likely to benefit from the uplifts to benefits
4. **Relative poverty** fell by more than absolute poverty 1.7 pp. because median income fell
5. This drop goes against the slowly increasing trend observed in recent years

Absolute and Relative Poverty in the UK, 2002–2021
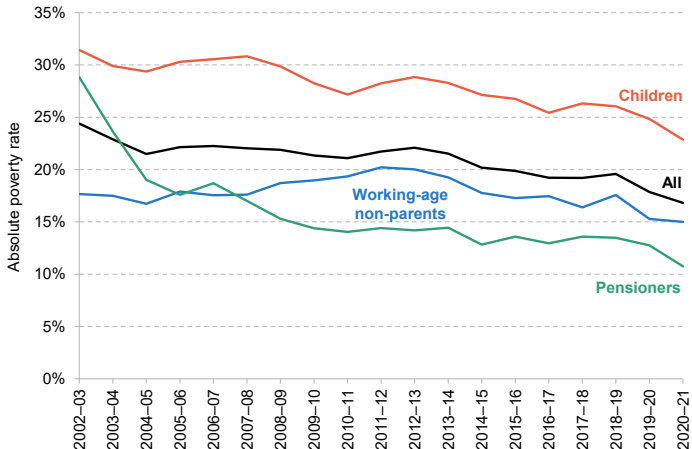
Note: Incomes have been measured net of taxes and benefits, with housing costs deducted. All incomes have been equivalised using the modified OECD equivalence scale. The absolute poverty measure gives the proportion living in a household with less than 60% of the 2010–11 median income, adjusted for inflation. **Source: Cribb et al (2022). IFS Report R215**

Absolute and Relative Poverty in the UK, 2002–2021
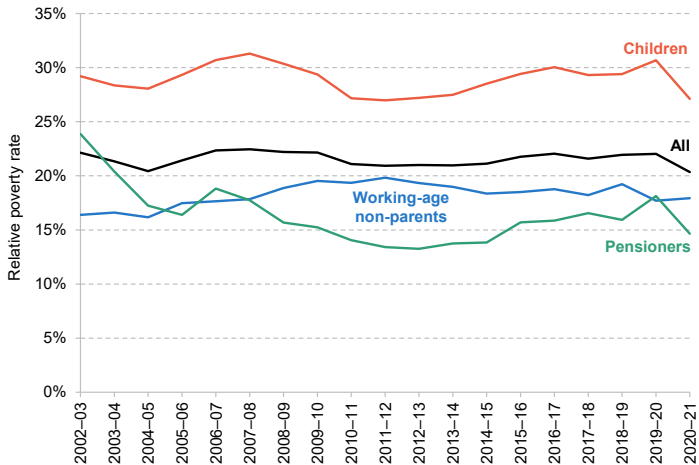
Relative poverty rate (y-axis), years 2002–03 through 2020–21 (x-axis)

Lines: **Children**, **All**, **Working-age non-parents**, **Pensioners**

Source: Cribb et al (2022). IFS Report R215

Note: Incomes have been measured net of taxes and benefits, with housing costs deducted. All incomes have been equivalised using the modified OECD equivalence scale. The relative poverty measure gives the proportion living in a household with less than 60% of the contemporaneous median income.

Long-run trends since 1961

Chart 11

Percentage of population in relative low income
Great Britain (1961-2001/02) and UK (2002/03-)
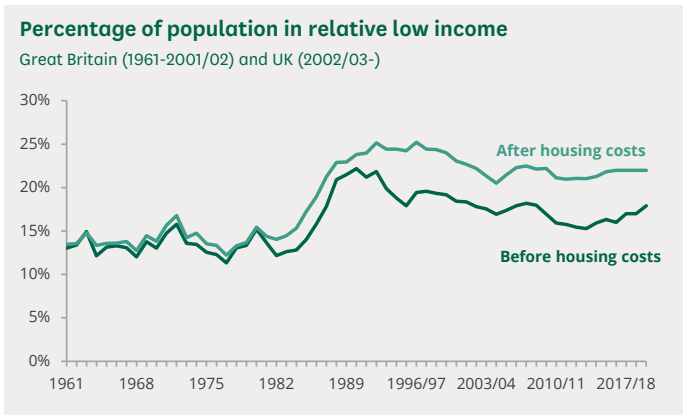
Note: Years refer to calendar years up and including 1992 and financial years from 1993/94 onwards.
Source: Institute for Fiscal Studies, using data compiled from the Family Resources Survey and Family Expenditure Survey; DWP

There was a large increase in the % of people in **relative poverty** during the 1980s, followed by a more gradual decline

Long-run trends since 1961

Chart 12
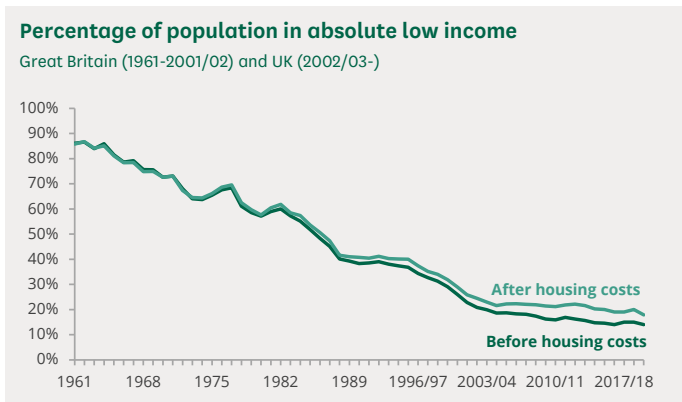
Percentage of population in absolute low income
Great Britain (1961-2001/02) and UK (2002/03-)

Source: Institute for Fiscal Studies, using data compiled from the Family Resources Survey and Family Expenditure Survey; DWP

In contrast, the % of people in **absolute poverty** has greatly reduced over the past 50 years because growth in incomes outstripped inflation

Measuring Intergenerational Income Mobility

Strong consensus that children's success should not depend too much on parental income

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. '14)

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

▶ Substantial heterogeneity in mobility across cities in the US

▶ Places with low segregation, low income inequality, good K-12 schools, high social capital, high family stability tend to have high mobility [this is a correlation not necessarily causal]

▶ Substantial racial disparity in mobility (Chetty et al. 2020)

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

Rank-Rank Slope (U.S) = 0.341
(0.0003)
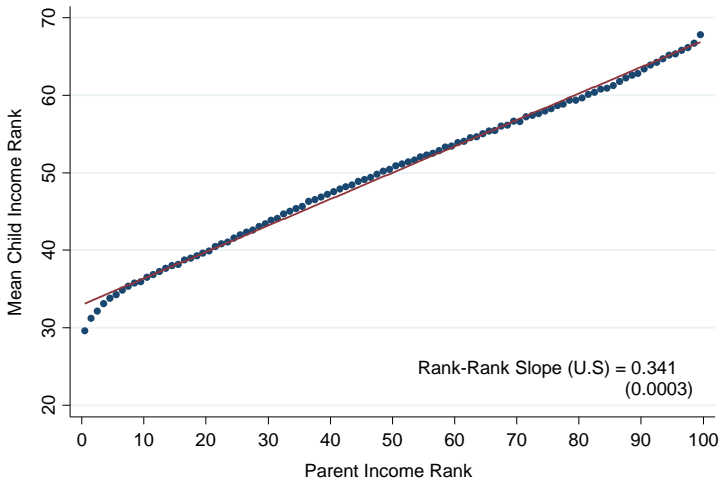
Source: Chetty, Hendren, Kline, Saez (2014)

B. United States vs. Denmark

Rank-Rank Slope (Denmark) = 0.180
(0.0063)
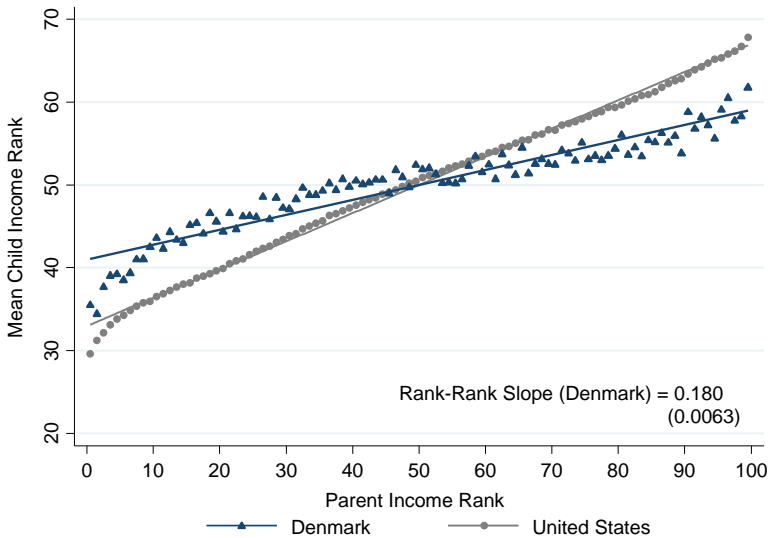
Source: Chetty, Hendren, Kline, Saez (2014)

The American Dream?

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

USA	Chetty, Hendren, Kline, Saez 2014	**7.5%**
UK	Blanden and Machin 2008	**9.0%**
Denmark	Boserup, Kopczuk, and Kreiner 2013	**11.7%**
Canada	Corak and Heisz 1999	**13.5%**
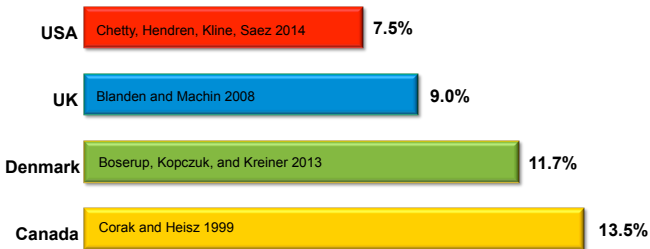
→ Chances of achieving the "American Dream" are almost two times higher in Canada than in the U.S.

The Geography of Upward Mobility in the United States
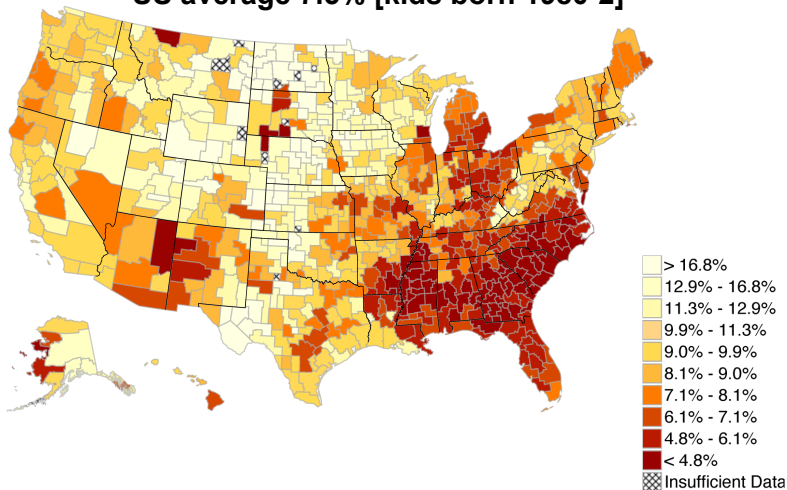## Probability of Reaching the Top Fifth Starting from the Bottom Fifth
US average 7.5% [kids born 1980-2]

Legend:
- > 16.8%
- 12.9% - 16.8%
- 11.3% - 12.9%
- 9.9% - 11.3%
- 9.0% - 9.9%
- 8.1% - 9.0%
- 7.1% - 8.1%
- 6.1% - 7.1%
- 4.8% - 6.1%
- < 4.8%
- Insufficient Data

Note: Lighter Color = More Upward Mobility
Download Statistics for Your Area at www.equality-of-opportunity.org

Intergenerational income mobility in England

Carneiro et al (2022) use linked UK admin data to estimate absolute income mobility for children born in England in the 1980s

They find huge differences across the country: the North has the lowest mobility and South-East the highest

- ▶ Children from low-income families who grew up in the lowest mobility areas - overwhelmingly in the North - are expected to end up around 15 ptiles lower at age 28 compared to those from the highest mobility areas - overwhelmingly in the South-East

- ▶ Average educational achievement across areas can explain 25% of this variation for men and 45% for women

- ▶ Education policy has a key role to equalise opportunities of children from low-income families across the country

Redistribution with Taxes and Transfers

Govt taxes people based on income & 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 (o progressive)

2) If inequality in y is more than inequality in $z \Leftrightarrow$ tax and transfer system is regressive

For example, tax/transfer system is:

a) **Neutral** if: $y = z \cdot (1 - t)$ with constant tax rate t

b) **Progressive** if: $y = z \cdot (1 - t) + G$ where G is a universal (lumpsum) transfer

c) **Regressive** if: $y = z - T$ where T is a uniform tax (poll tax)

Current tax/transfer systems in most economies look roughly like b)

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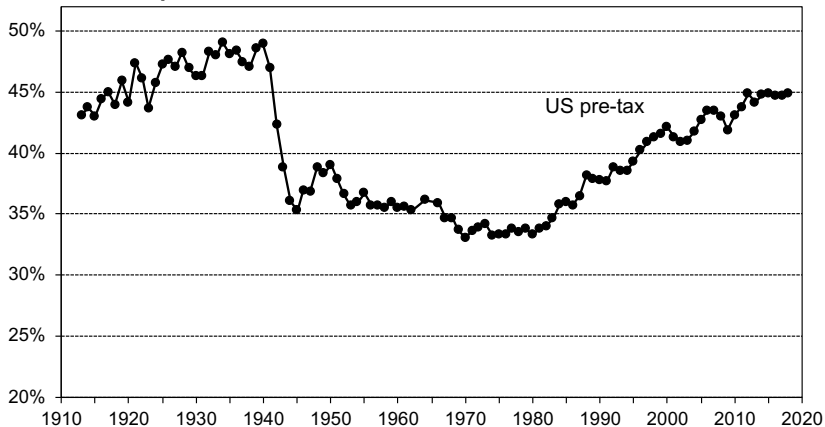
US pre-tax

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).
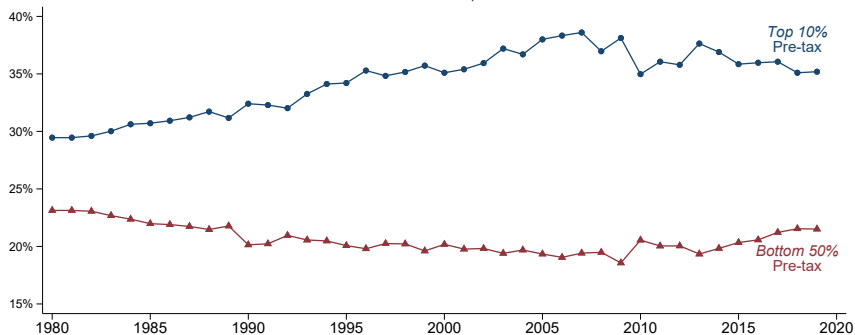
US Top 10% Income Shares pre-tax vs. post-tax, 1913-2018

US pre-tax
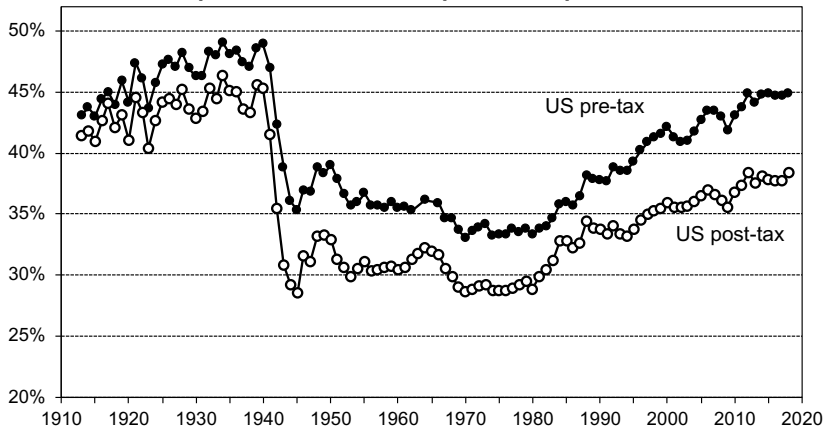
US post-tax

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.

UK Top 10% and Bottom 50% Income Shares
Pre-tax vs Post-tax, 1980-2019

Notes: National income share held by a given percentile group before (Pre-tax) and after (Post-tax) taking into account the
operation of the tax/transfer system (includes pensions). Source: based on https://wid.world/country/united-kingdom/
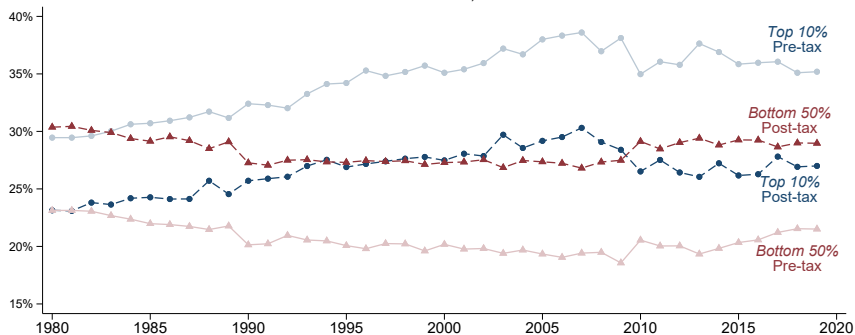
UK Top 10% and Bottom 50% Income Shares
Pre-tax vs Post-tax, 1980-2019

Notes: National income share held by a given percentile group before (Pre-tax) and after (Post-tax) taking into account the operation of the tax/transfer system (includes pensions). Source: based on https://wid.world/country/united-kingdom/

Progressivity of the UK income tax

► Statutory top rates are highest on employment income than on other forms of income

► Company owner-managers have a strong tax incentive to pay themselves in capital gains or dividends rather than in salary

► At each income level, there is a range of average tax rates – i.e., tax paid as a share of income. People face different statutory rates depending on the form of income

► Income taxes are progressive – average tax rates rise with income

► Within the top 1%, the mean average tax rate is 38%; 41% when including employee and self-employed NICs

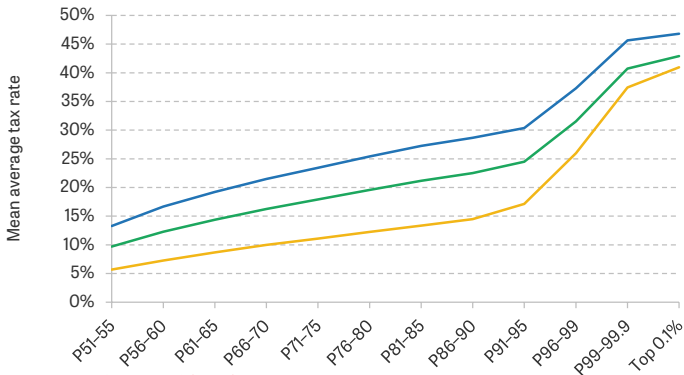**Figure 8. Top marginal statutory tax rates, 2021–22**
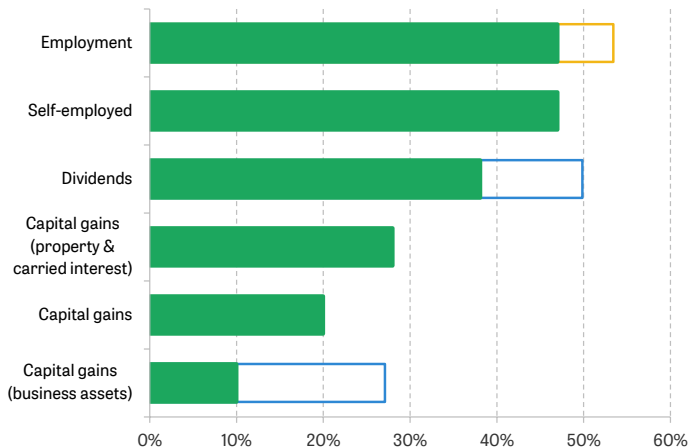
Source: Delestre et al (2022)

Legend:
- Excluding employer NICs & corporation tax
- Inclusive of corporation tax
- Inclusive of employer NICs

Figure 9. Mean average tax rates across the fiscal income distribution, 2018–19

Source: Delestre et al (2022)

Income tax only

Income tax, employee and self-employed NICs

Income tax and all NICs

US Tax/Transfer system is progressive overall

Average tax rates by income group in 2018 (% of pre-tax income)

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)

US Tax/Transfer system is progressive overall

Average tax rates by income group in 2018 (% of pre-tax income)

Estate tax

Individual income taxes

Payroll taxes

Corporate & property taxes

Consumption taxes
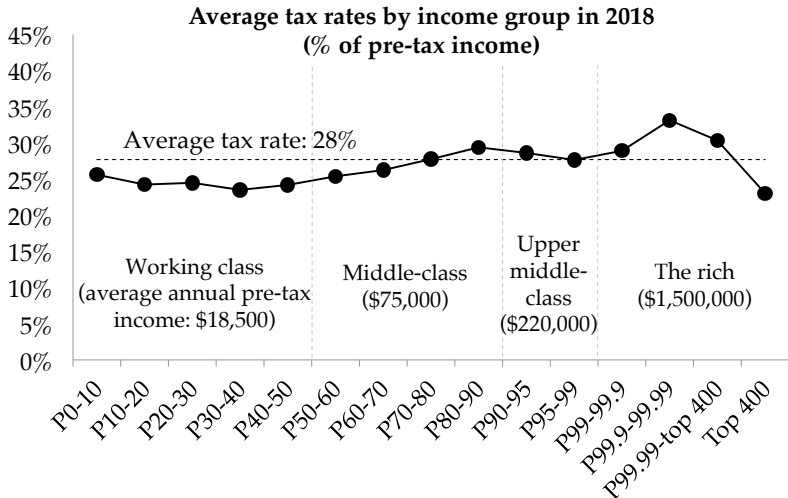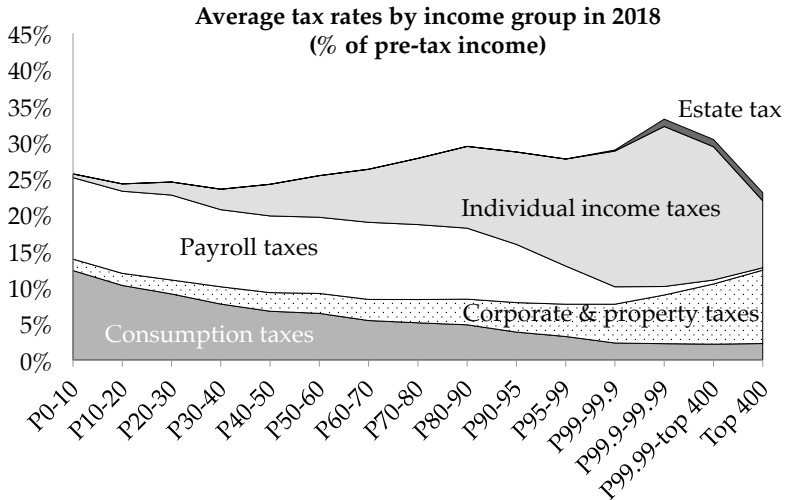
But progressivity has declined since 1950 (Saez & Zucman, 2019)

Average tax rates by income group (% of pre-tax income)

Working class — Middle-class — Upper middle-class — The rich

1950 · 1960 · 1970 · 1980 · 1990 · 2000 · 2010 · 2018
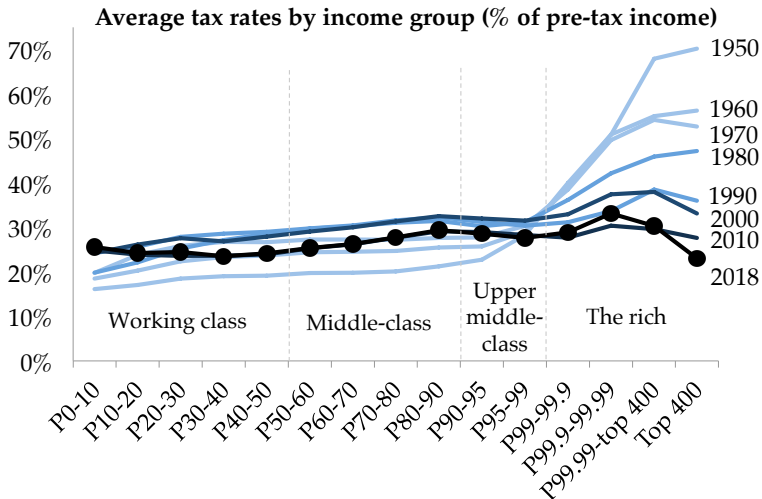
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