

# **Economic Growth**

## **Lecture 11: Income Inequality**

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**İlhan Güner**

**University of Kent | EC569**

# Introduction

- So far, we have focused on average level of income in a country
- In this lecture, we will investigate how income is divided among the residents of a country (distribution of income)
- Distribution of income matters as well as average income.
  - In 2005, average income in India (\$2,557) was 21% larger than that of Pakistan (\$2,112)
  - Fraction of the population living on income of less than \$1.25 per day
    - 41.6% in India
    - 22.5% in Pakistan

# Overview

- Income inequality: the facts
  - Top income shares vs Gini coefficient
  - Market income vs disposable income
  - Within country inequality vs global inequality
- Sources of income inequality
- Effects of income inequality on economic growth

# **Income inequality: facts**

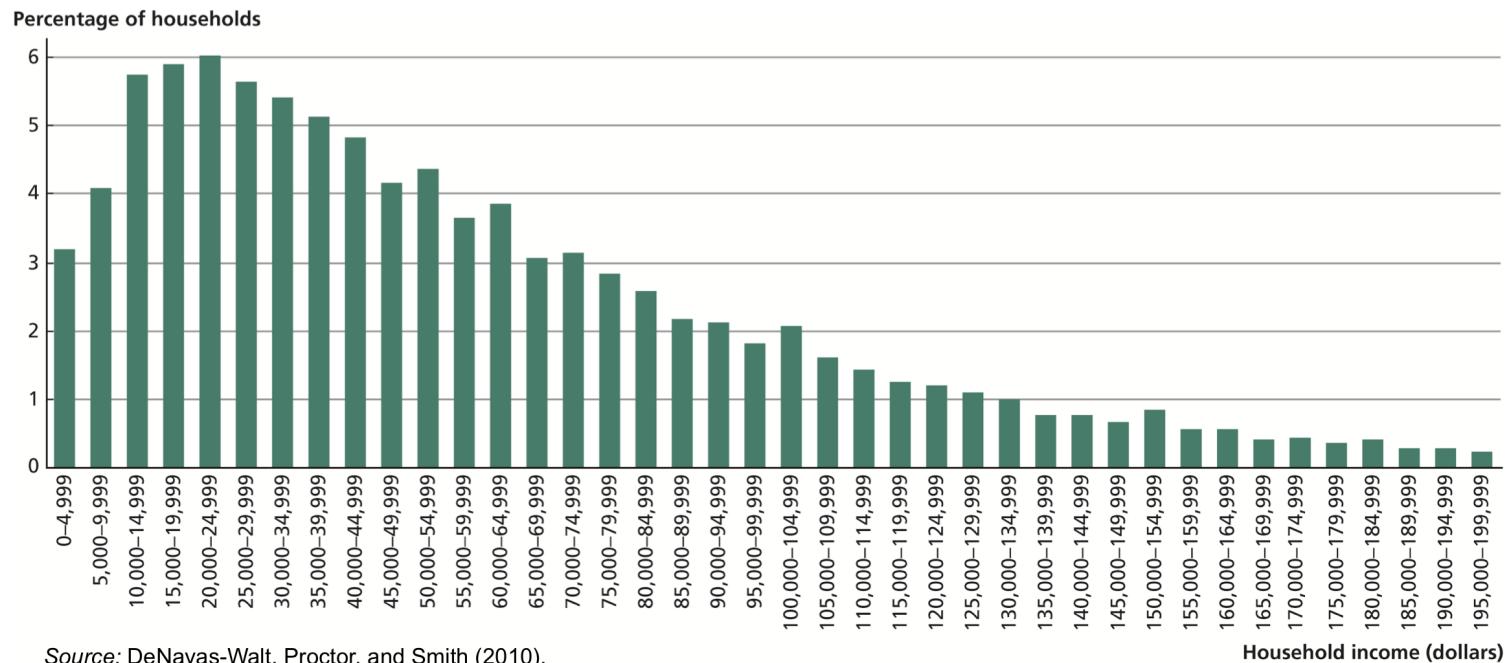
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# Income distributions

Two ways of looking at income distribution:

1. Divide income into equal-sized intervals
  - measure number of people (or fraction of population) in each interval
2. Divide the population into several equal-sized groups
  - measure how much each group earns

# Income Distribution in the US, 2009



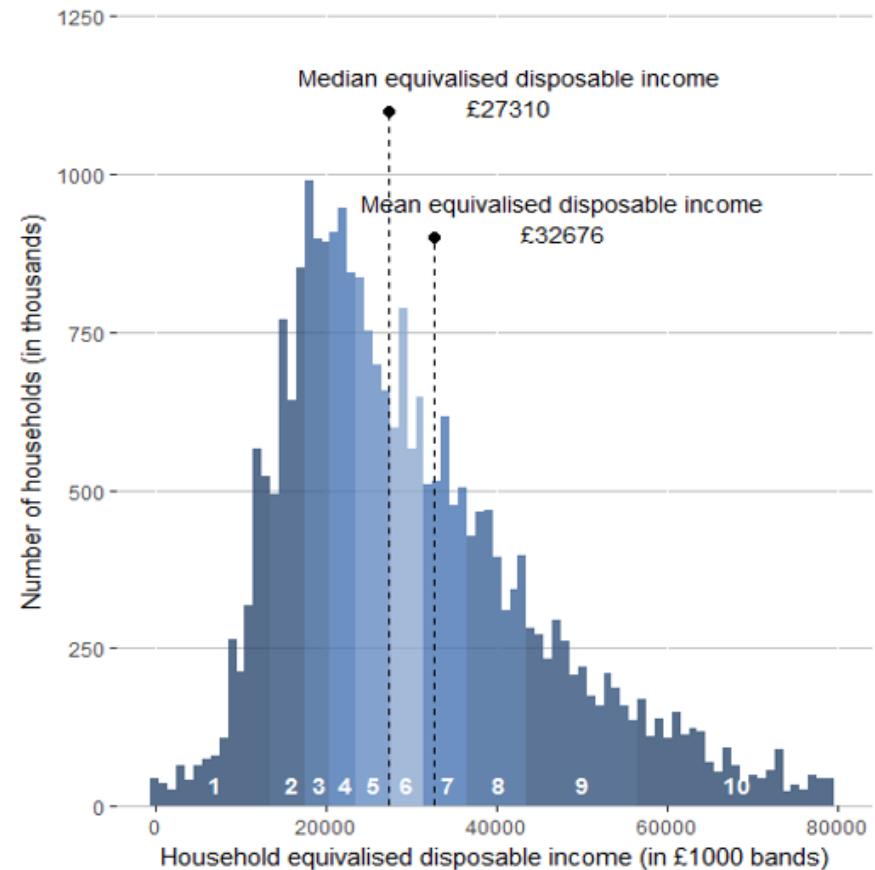
Graph from: Weil (2013)

- Mean household income: \$67,979
- Median household income: \$49,777
- Income distributions are always skewed
  - long right tail

# Disposable income distribution in the UK, 2017

The equivalised disposable income is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults. – Eurostat

- Mean income > Median income
- Skewed distribution



Source: ONS, 2017 data

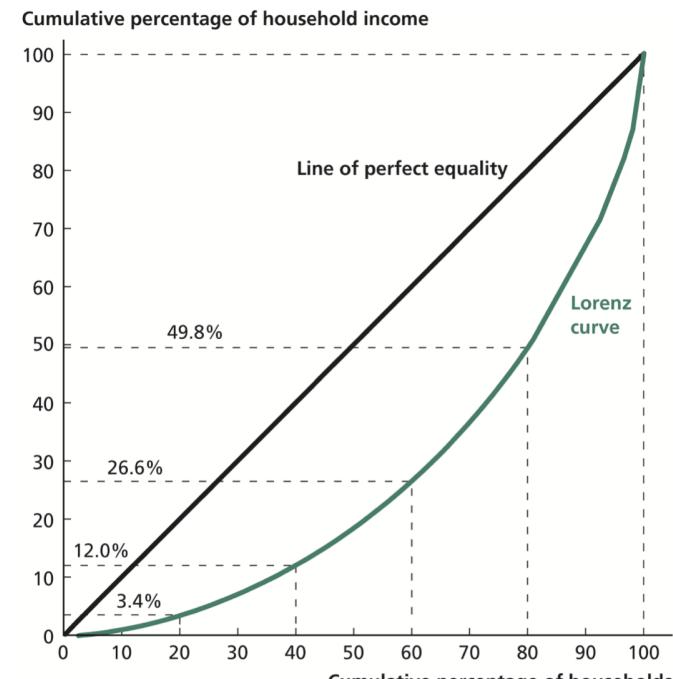
# Measuring Inequality

- Top income shares
  - Share of total income going to top earners
- Gini coefficient
  - Derived from the Lorenz curve

# Measuring Inequality, Lorenz Curve

- Arrange households from lowest to highest income
- Calculate the fraction of the total income earned by the poorest 1 percent
- Then, fraction of the total income earned by the poorest 2 percent
- So on
- Graph these data
- The more bowed out is the Lorenz Curve, the more unequally income is distributed.

The Lorenz Curve for the United States, 2009



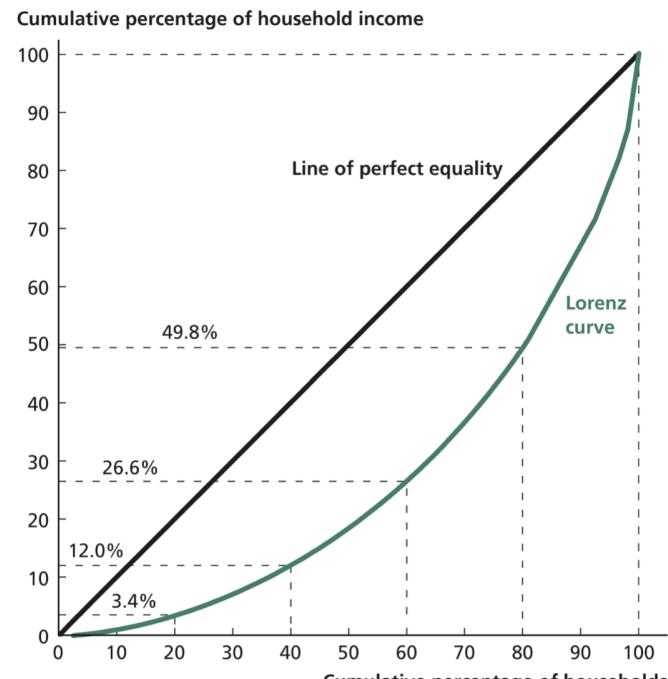
Source: De Navas-Walt, Proctor, and Smith (2010).

Graph from: Weil (2013)

# Measuring Inequality, Gini coefficient

- Gini coefficient:
  - the area between the Lorenz Curve and the line of perfect equality divided by the total area under the line of perfect equality
- Perfect equality: Gini coefficient = 0 (or 0%)
- Perfect inequality: Gini coefficient = 1 (or 100%)
- The closer is the coefficient to zero, the more income is distributed equally in a country
- Gini coefficient in the US: 0.468 (or 46.8%)
- Gini coefficient in the UK: 0.34 (or 34 %) (in 2014, World Bank)

The Lorenz Curve for the United States, 2009



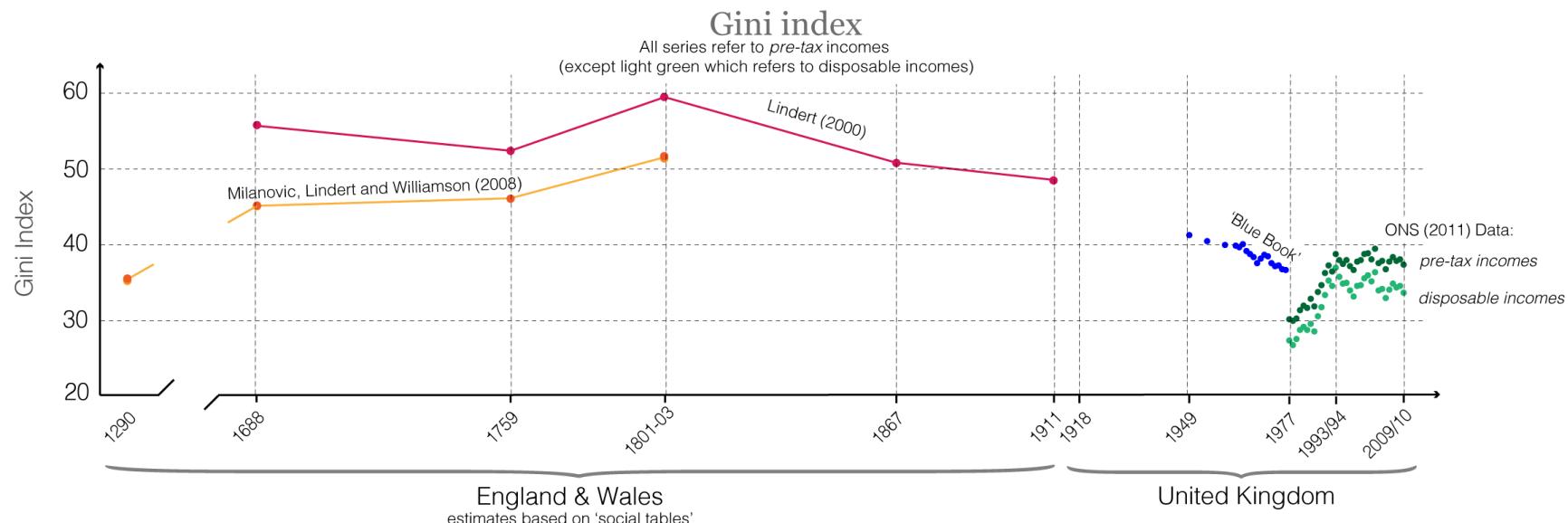
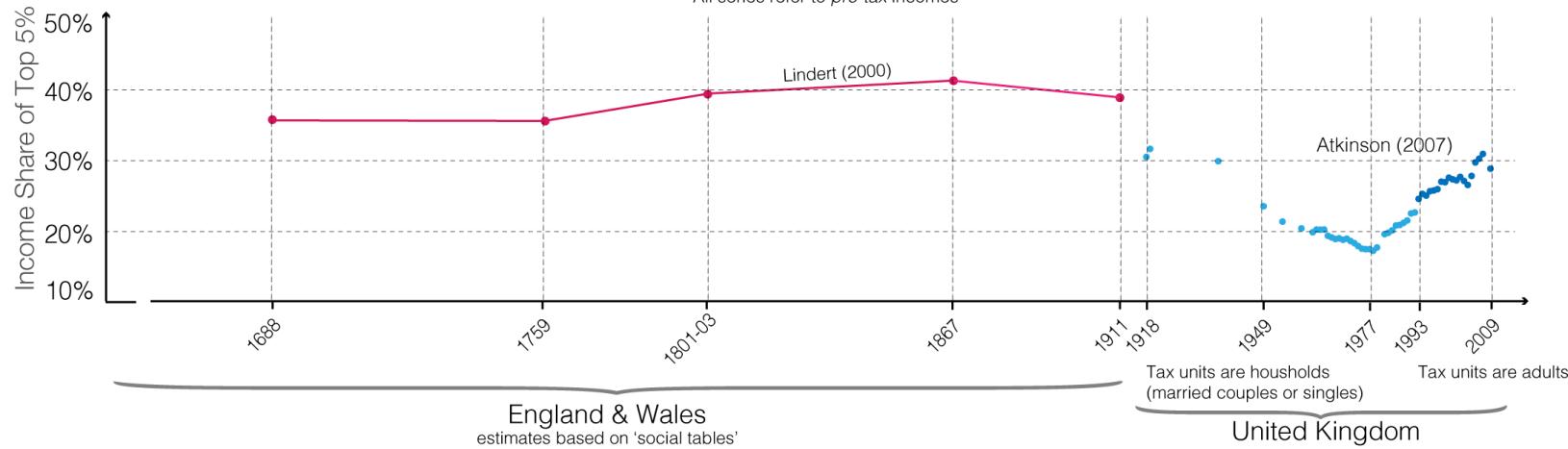
Source: De Navas-Walt, Proctor, and Smith (2010).

Graph from: Weil (2013)

# Income inequality in the UK over 700 years (1290-2010)

Share of total income going to the top 5% of income earners

All series refer to *pre-tax* incomes



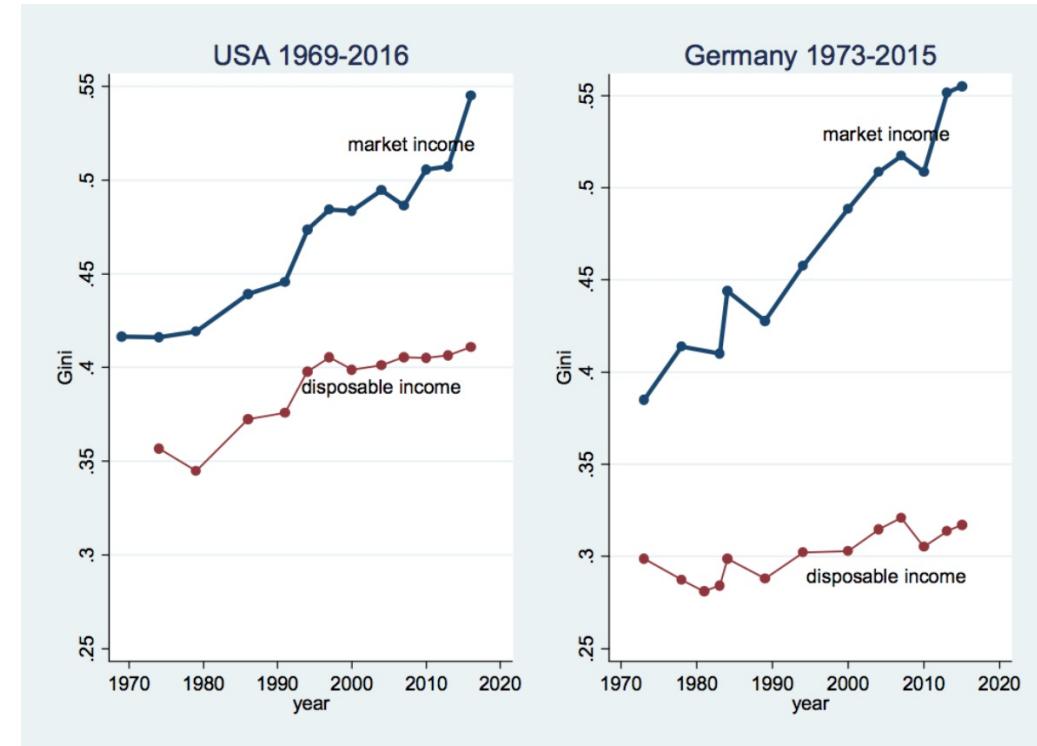
# **Market income inequality versus disposable income inequality**

- Market income:
  - Labor income
  - Capital income
- Disposable income (income that reaches people's pockets):
  - Labor income
  - Capital income
  - Transfers (e.g. social security)
  - Minus taxes

# Market income vs disposable income inequality

Milanovic (2018):

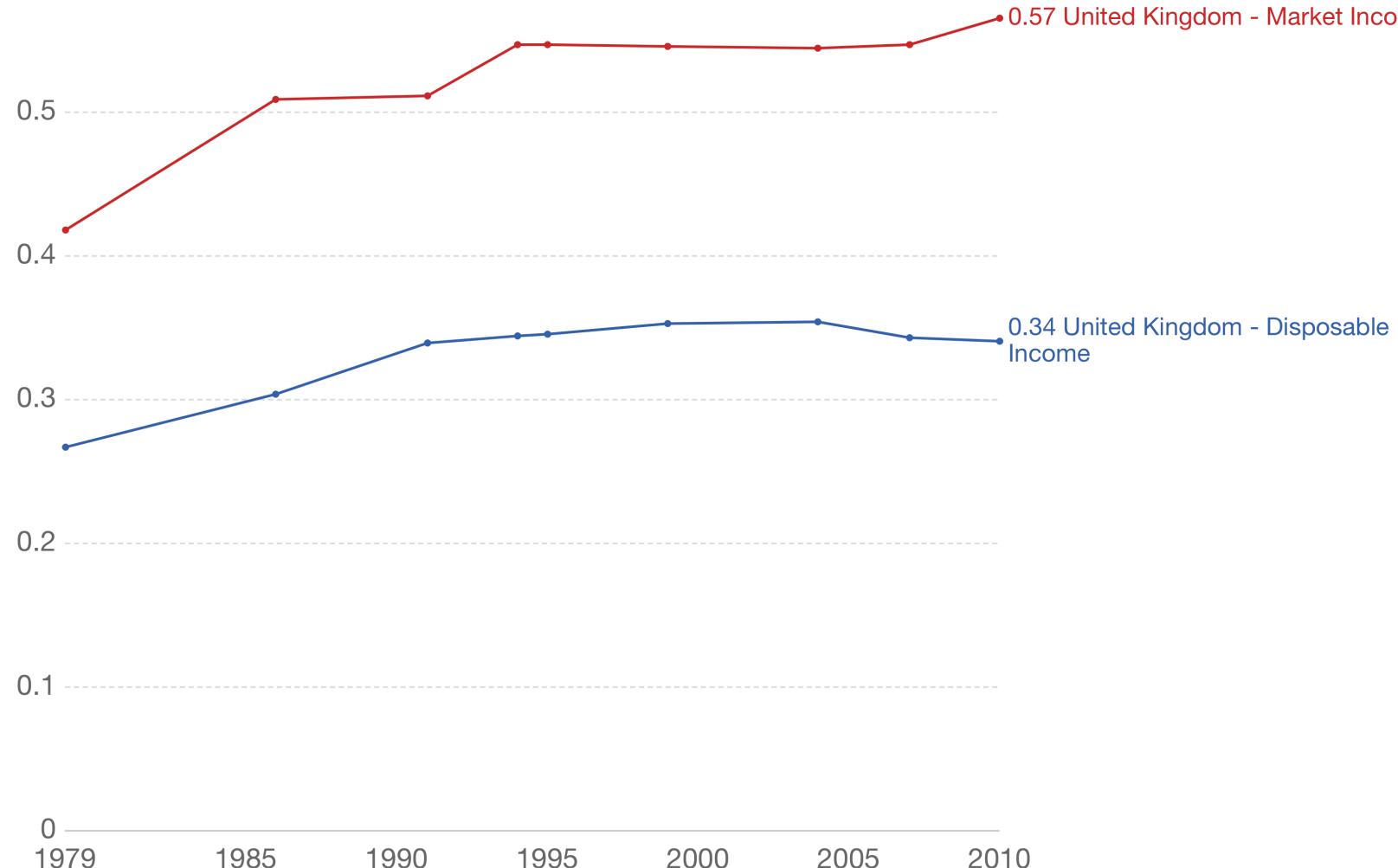
- Out of 17 OECD countries (with comparable data)
  - 15 saw an increase in disposable income inequality
  - from mid 1980s to 2013-15.
- Inequality of market incomes went up by even more.
- In both USA and Germany, disposable income inequality is less than market income inequality
- Market income inequality increased more in Germany than the US
- Disposable income inequality increased less in Germany than the US



Source: Milanovic (2018), Calculated from Luxembourg Income Study (LIS) data

# Inequality of incomes before and after taxes and transfers

Shown is the Gini – higher values indicate higher level of inequality – for equivalised household income.

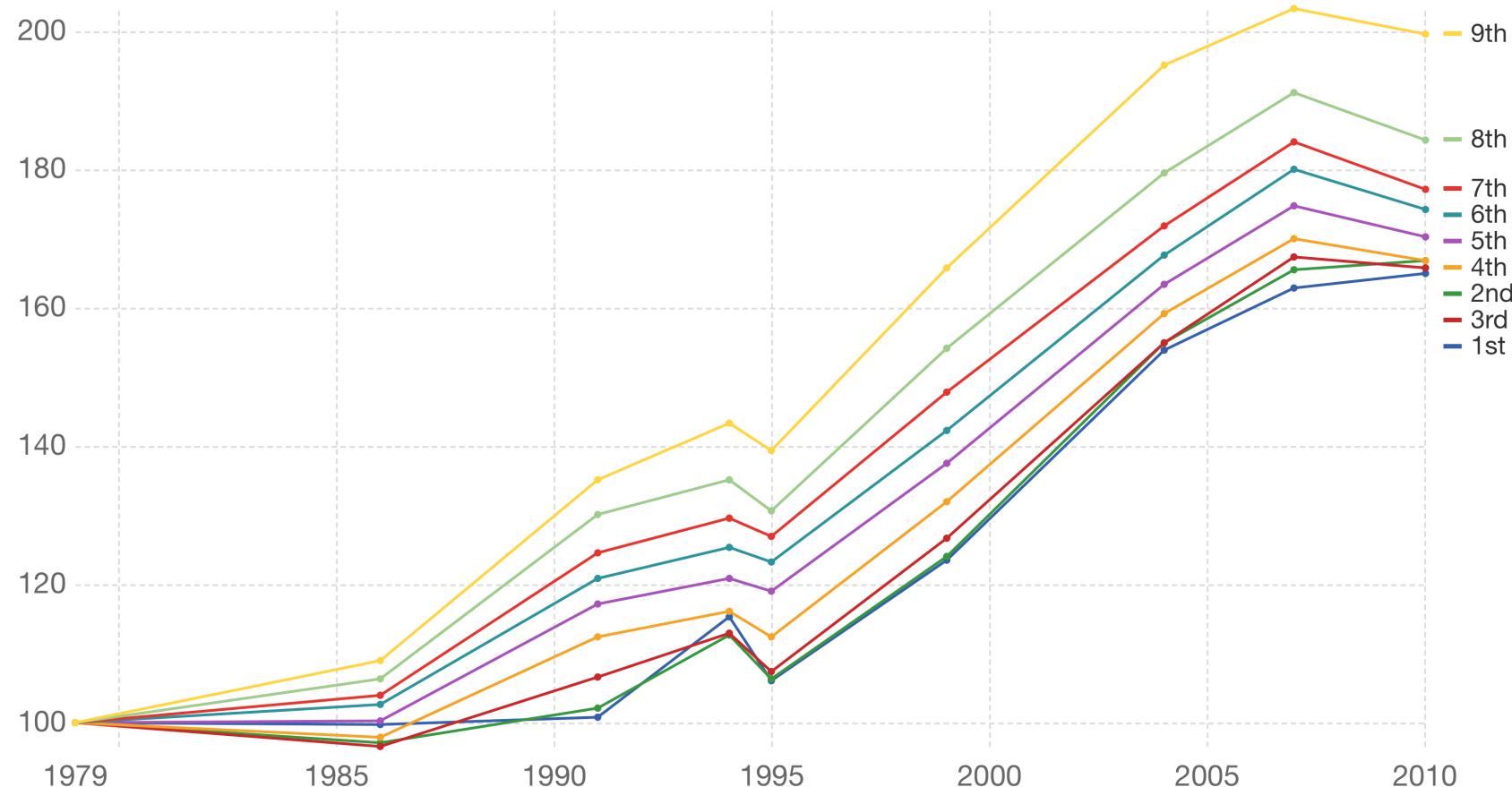


Source: Incomes across the Distribution Database, Gini (2016)

[OurWorldInData.org/income-inequality/](http://OurWorldInData.org/income-inequality/) • CC BY

# Growth of Real Disposable Household Income by Decile, United Kingdom

Disposable household income is the sum of a household's employment and self-employment income, capital income, social security and private transfers minus income taxes and social security contributions.



Source: Incomes across the Distribution Database (authored by Nolan, Thewissen, Roser; based on LIS) indexed to the first year (2016)

Note: Adjusted for household size, inflation and price differences between countries and expressed in 2011 international dollars. 1st decile is the cutoff income between the 10% of the population with the lowest income etc.

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# Within country inequality versus global income inequality

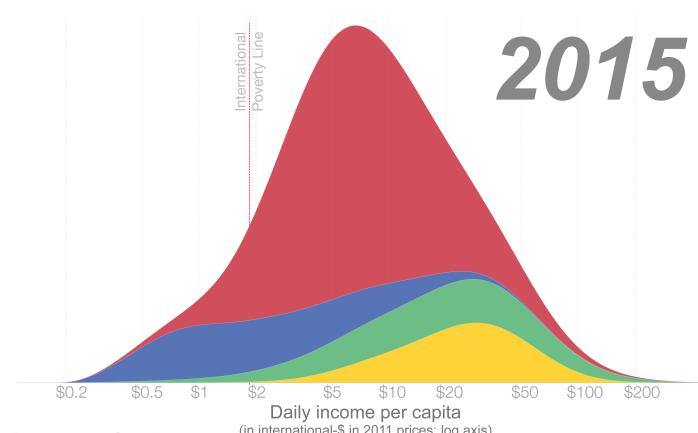
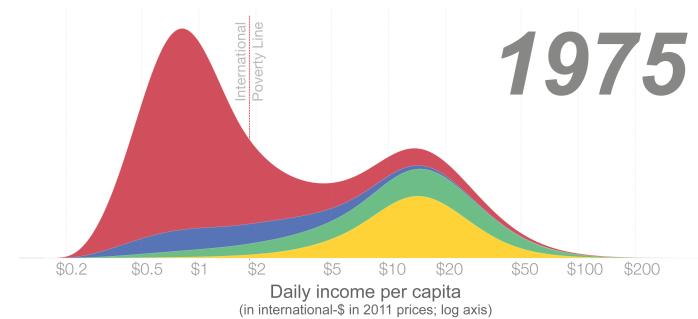
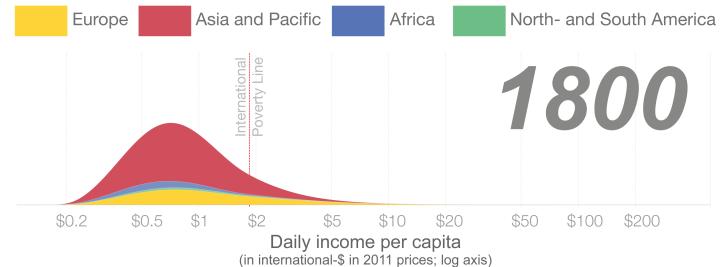
- So far we focused on within country inequality
  - Evidence that inequality increases in many countries over the last decade.
- Global income inequality
  - Income inequality among all the people in the world
  - Declined in the last decades
  - Gini in 2003: 0.687, Gini in 2013: 0.649 (  
Tomáš Hellebrandt and Paolo Mauro  
(2015))

## Global income distribution in 1800, 1975, and 2010

OurWorld  
inData

Income is measured by adjusting for price changes over time and for price differences between countries (purchasing power parity (PPP) adjustment).

These estimates are based on reconstructed National Accounts and within-country inequality measures. Non-market income (e.g. through home production such as subsistence farming) is taken into account.



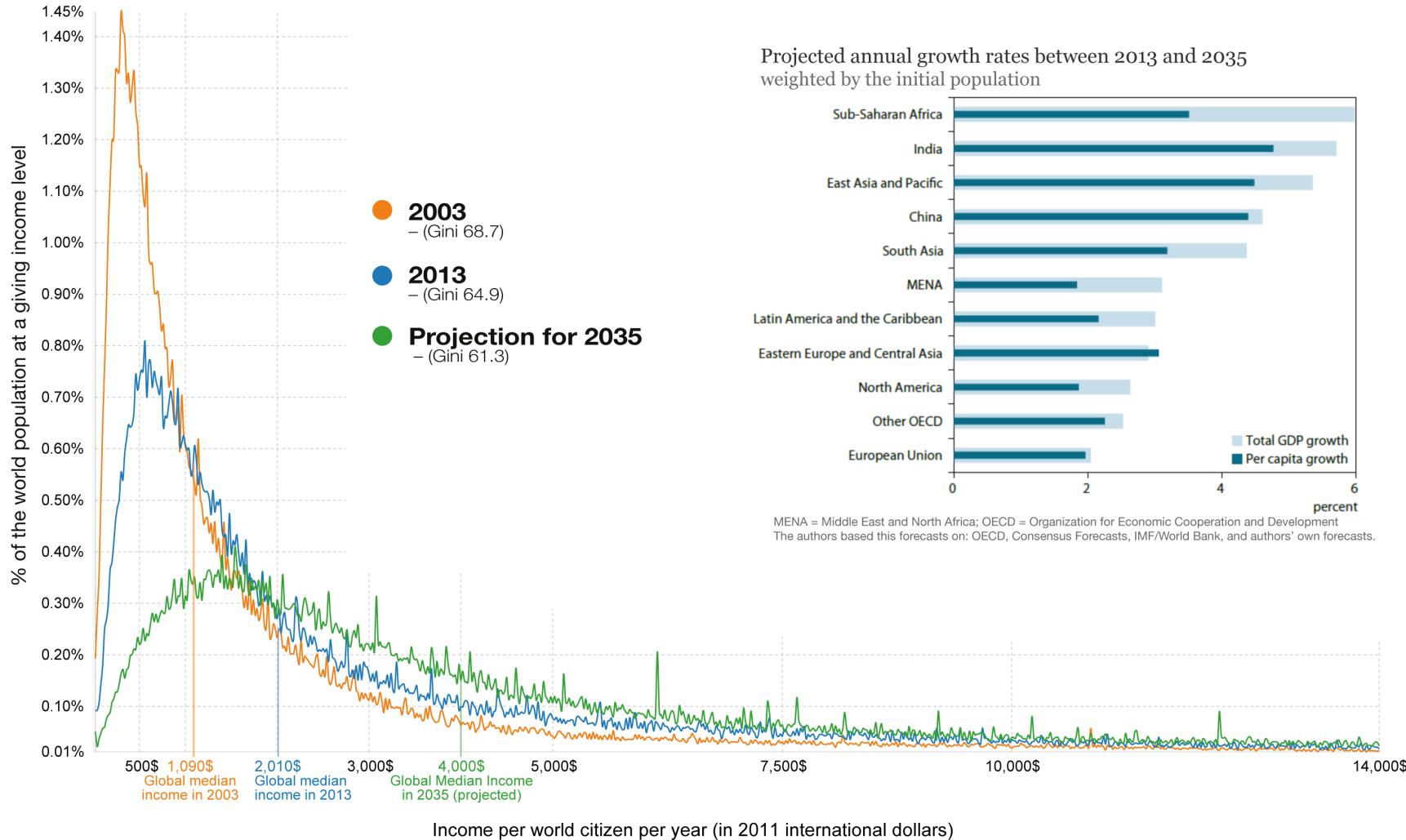
Data source: Gapminder

The visualization is available at [OurWorldInData.org](http://OurWorldInData.org) where you find more visualizations and research on global development.

Licensed under CC-BY-SA by the author Max Roser.

# The global income distribution in 2003, 2013, and the projection for 2035

Incomes are adjusted for price changes over time and for price differences between countries (purchasing power parity (PPP) adjustment).



Source for all data: Tomás Hellebrandt and Paolo Mauro (2015) – The Future of Worldwide Income Distribution, working paper.  
The interactive data visualization is available at [OurWorldinData.org](http://OurWorldinData.org). There you find the raw data and more visualizations on this topic.

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# **Sources of income inequality**

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# Sources of income inequality

Why is there income inequality?

- Characteristics of people that affect income
  - ownership of physical capital: inheritance, investment
  - human capital: health, education
  - occupation specific skills/talent: leadership, artistic skills, language skills etc.
  - geography/location: where people live
  - matching of characteristics with economic environment
- factors not related to productivity of people:
  - monopoly rents
  - corruption

# **Education as a source of income inequality**

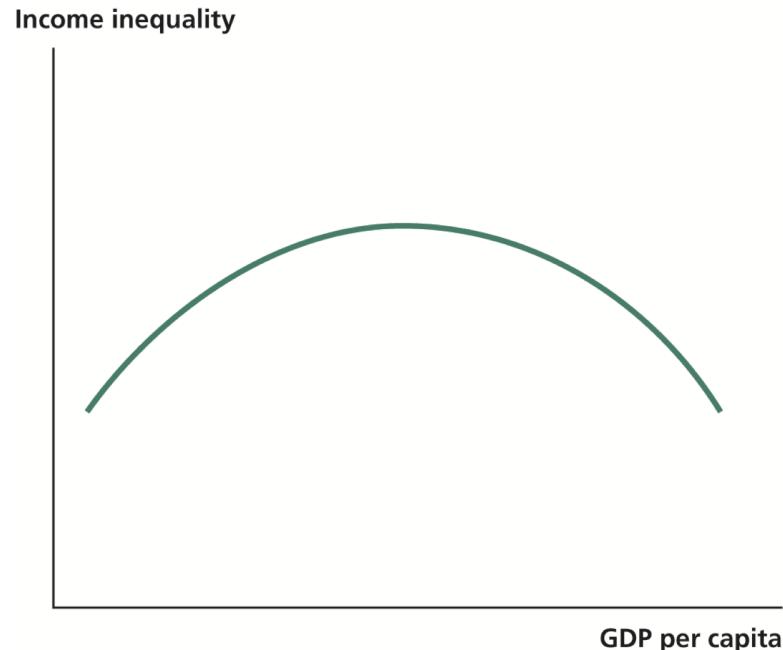
- lower return to education reduces income inequality
  - the earning difference between the poor and the rich decreases
- narrower distribution of years of education reduces income inequality
  - the fraction of middle income workers increases

# **Income inequality and economic growth**

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# The Kuznets Curve

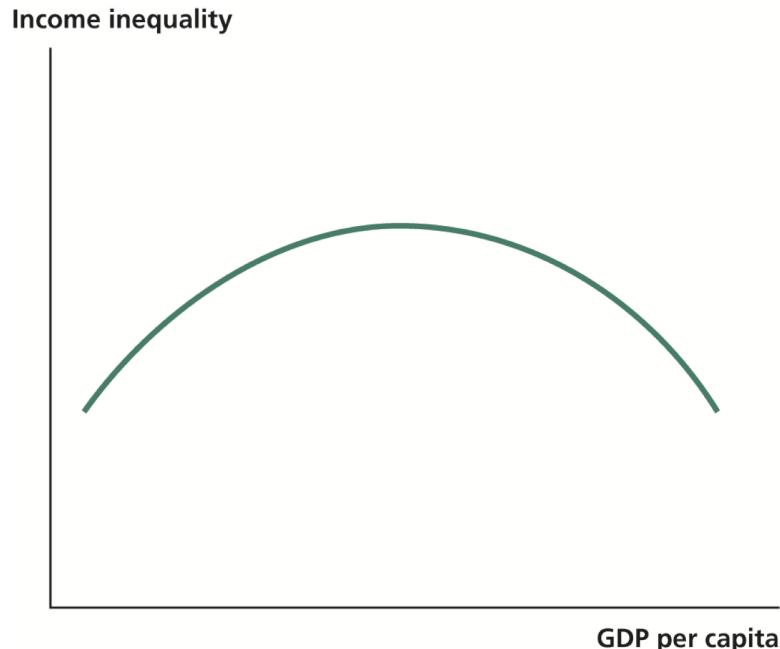
Simon Kuznets' hypothesis (1955): as a country develops, inequality should first rise and then fall



Graphic from: Weil (2013)

# The Kuznets Curve

Simon Kuznets' hypothesis (1955): as a country develops, inequality should first rise and then fall



Graphic from: Weil (2013)

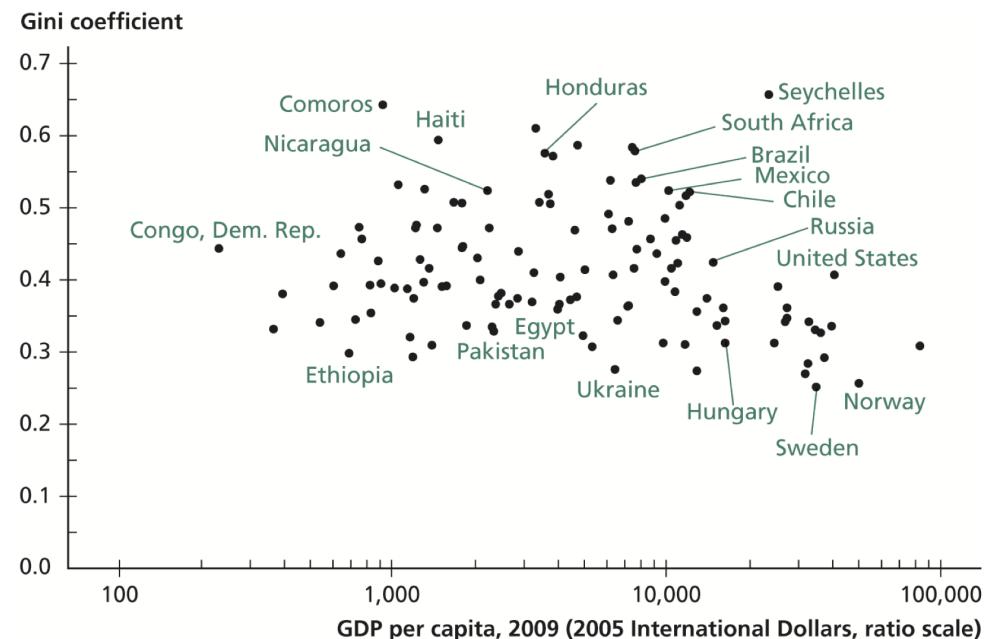
## The Kuznets Curve in England and Wales, 1823--1915



Graph from: Weil (2013)

# Income per capita versus inequality

- Data in this graph does not provide evidence to Kuznets curve
- Many other factor contribute to inequality
  - If one controls for these factors, we may still get an inverse-U relationship between GDP per capita and inequality
- Robert Barro estimates that the peak of the Kuznetz curve is about \$5 thousand (in 2000 dollars)



Source: *World Development Indicators* database, Heston et al. (2011).

Graph from: Weil (2013)

# Explaining the Kuznets Curve

- Technological progress raises the returns to skills (education, entrepreneurial ability)
  - marginal product of human capital increases
  - skilled workers earn more
  - income inequality increases
- Technological progress raises return to physical capital
  - technologies are often embedded in new capital goods
  - skills and capital are found at the higher end of distribution
  - inequality rises

# Explaining the Kuznets Curve

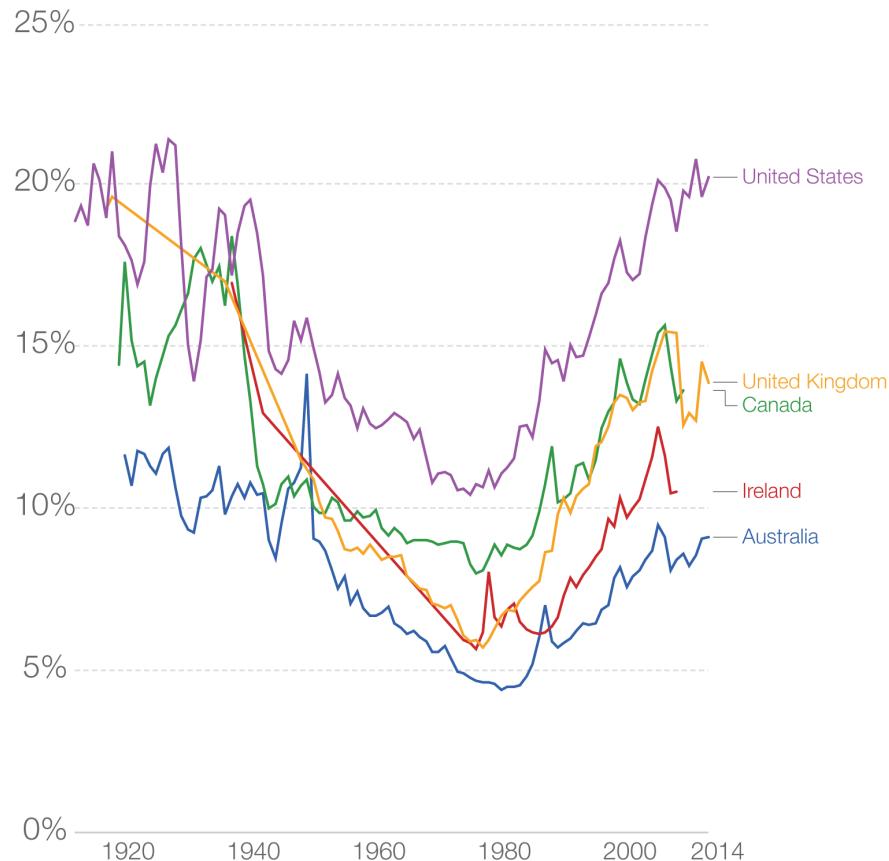
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- Resource reallocation gradually takes place
  - unskilled workers increasingly value education given the widened wage gap
  - workers flow into fast-growing regions/industries
  - as technological progress slows down, return to physical capital decreases
  - income inequality decreases

# **Explaining the recent rise in income inequality**

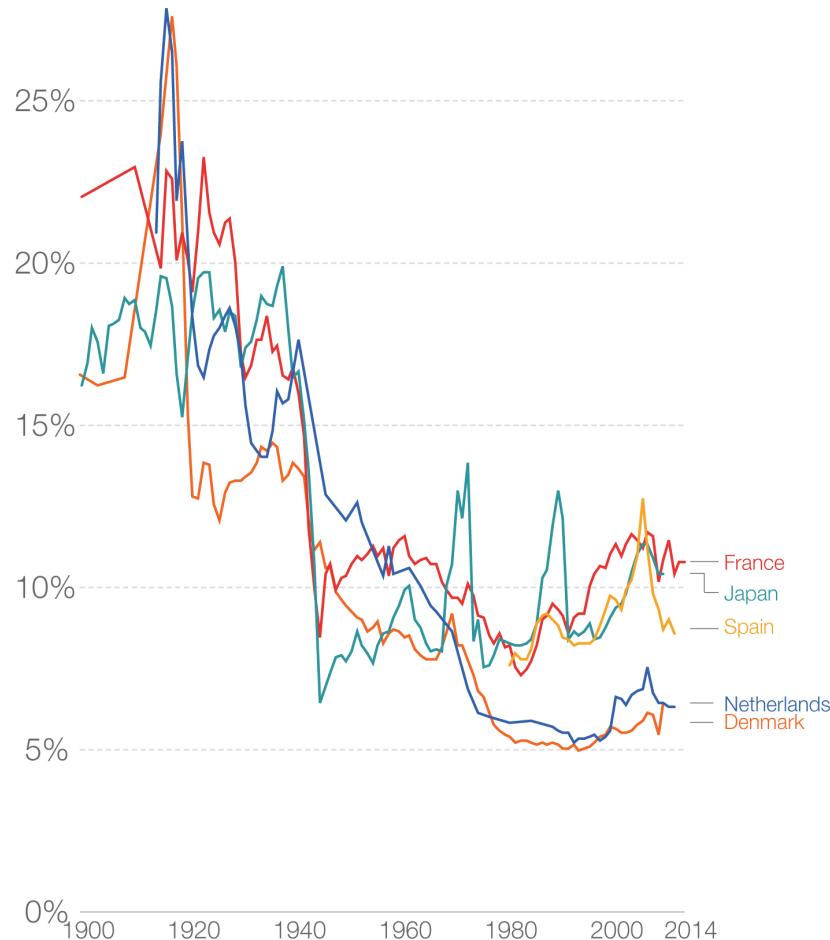
- Technological progress
  - rise of information technology: return on education should rise
  - Skill-biased technological change
- Increases in international trade
  - demand for internationally scarce resources: return on education should rise
  - owners of internationally scarce resources benefit
- Superstar dynamic
  - people with the highest levels of some qualities earn much more than people with only slightly lower qualifications
  - sports, entertainment
- Government policies (deregulation, tax policy, etc)

# Share of Total Income going to the Top 1% since 1900

The evolution of inequality in English speaking countries followed a U-shape



The evolution of inequality in continental Europe and Japan followed an L-shape



Data source: World Wealth and Income Database (2018). This is income before taxes and transfers.

This data visualisation is available at [OurWorldinData.org](http://OurWorldinData.org). There you find the raw data and more visualisations on inequality and how the world is changing. Licensed under CC-BY-SA by the author Max Roser.

# **Effect of Income Inequality on Economic Growth**

Inequality leads to high capital accumulation

- rich people have a higher saving rate than poor people
- the greater proportion of income earned by the rich the higher the national savings rate
- greater income inequality leads to higher income per capita via physical capital accumulation

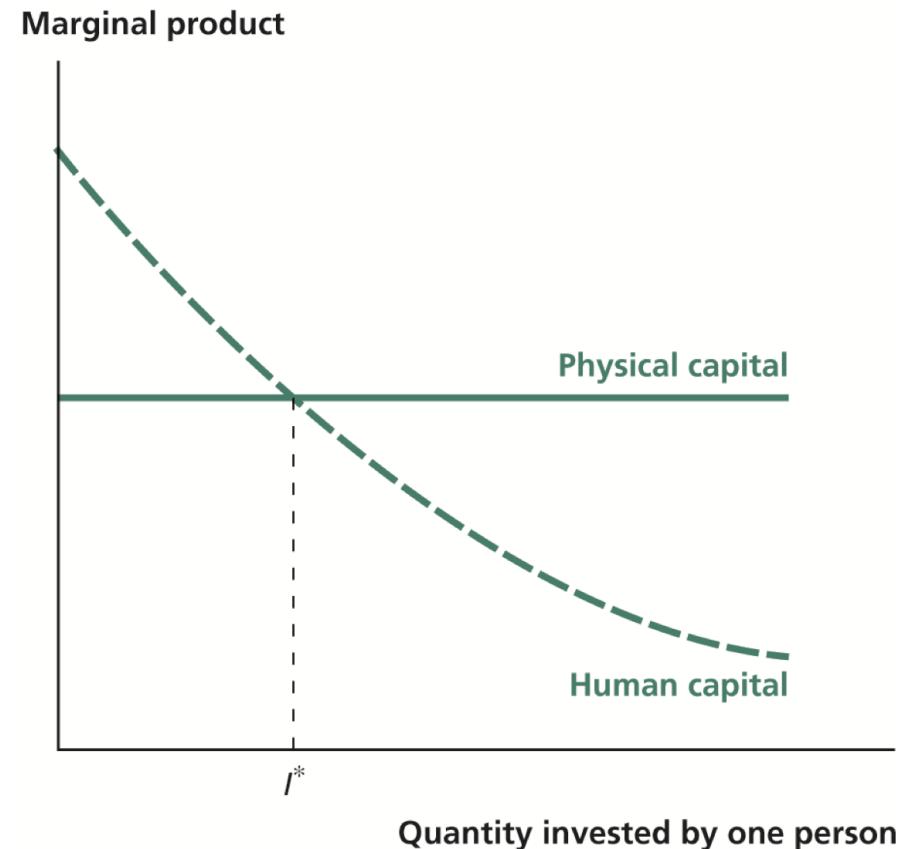
If a country is open to flows international capital flows

- Investment does not need to be financed by domestic savings
- Effects of inequality on physical capital accumulation will be diminished

# Effect of Income Inequality on Economic Growth, cont'd

Inequality leads to low human capital accumulation

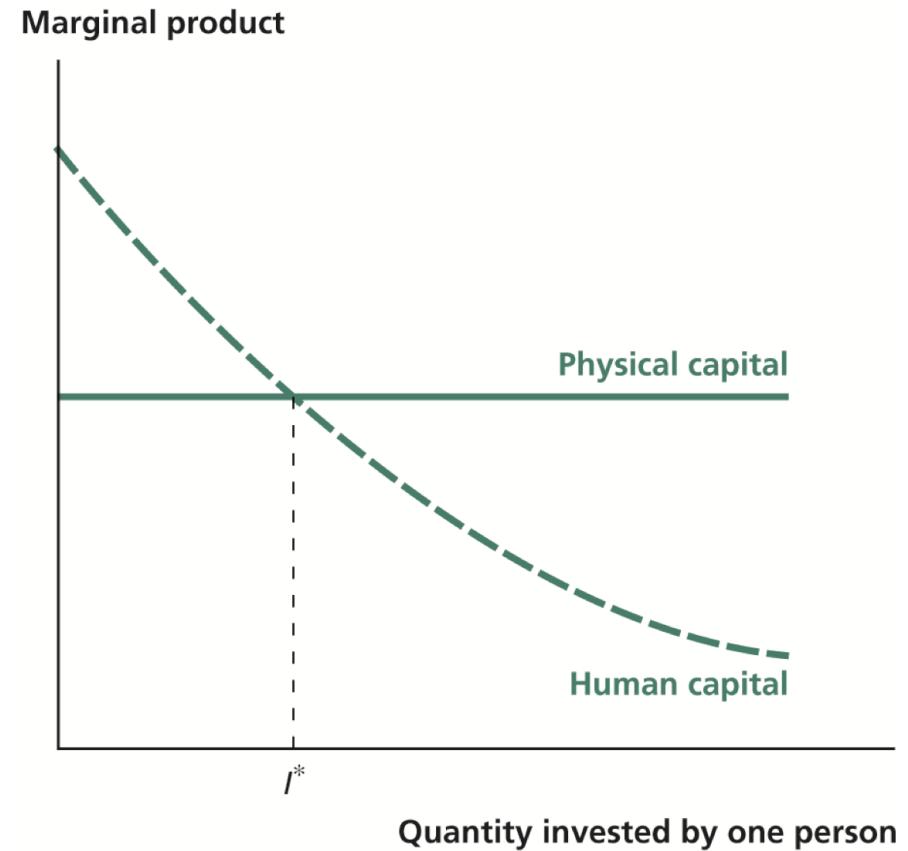
- Human capital is installed in a specific person
  - marginal return decreases as human capital increases
- Physical capital can be rented to other people
  - marginal return does not depend on a person's investment



Graphic from: Weil (2013)

# Effects of inequality on human capital accumulation

- Poor people invest mainly in human education
- After one point, the rich stop investing in human capital
  - Gini coefficient for physical capital in the US: 0.78
  - Gini coefficient for years of education: 0.14
- If income is taken from the poor and given to rich
  - The poor decreases human capital
  - The rich do not invest in human capital
  - Total human capital decreases
  - Income decreases
- If a country is open to flows international capital flows
  - the negative effects of inequality on human capital remain



Graphic from: Weil (2013)

# **Income inequality, income redistribution, and efficiency**

Redistributionary taxes leads to distortion

- progressive tax charges higher tax rates on the more productive worker
- income tax discourages labor: inefficiency (dead-weight loss) increases
- greater income inequality leads to lower income per capita

There are counter arguments about this point.

# Empirical evidence

Available data is not sufficient to estimate the individual effects of inequality on growth

- no evidence that countries with higher income inequality has higher capital stock accumulation
- in countries where income inequality is higher the level of education is lower (matches predictions of this chapter)
- no evidence that higher income inequality leads to more redistributive taxation

# Summary

- Evidence of increasing income inequality within the advanced economies
- Evidence of decreasing income inequality in the world as whole
- Theoretical channels on the interrelationship between income inequality and economic growth are analyzed

To review this lecture

- Read Chapter 13 of Weil (2013)
- Read The Inequality Paradox: Rising Inequalities Nationally, Diminishing Inequality Worldwide
- Take a look at Income Inequality entry from ourworldindata.org