EC569 Economic Growth
Income Inequality (Lecture 9)

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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)
- In 2005, average income in India ($2,2557) 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
- Distribution of income matters as well as average income.

- Income inequality: the facts
- Sources of income inequality
- Effect of income inequality on economic growth

Distribution of Income

- Divide population into several equal sized groups and measure how much each group earns
- Divide population into different categories of income and look at the fraction of the population in each

Table 13.1: Household Income in the United States by Quintiles, 2009

| Quintile	Average Household Income	Share of Total Household Income (%)
1st (Lowest)	$11,552	3.4
2nd	$29,257	8.6
3rd	$49,534	14.6
4th	$78,694	23.2
5th (Highest)	$170,844	50.3

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

In 2009,

- mean income $67,979
- median income $49,777
- Distribution is skewed, it has very long right tail

Figure 13.1: Income Distribution in the United States, 2009

Percentage of households

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

Household income (dollars)
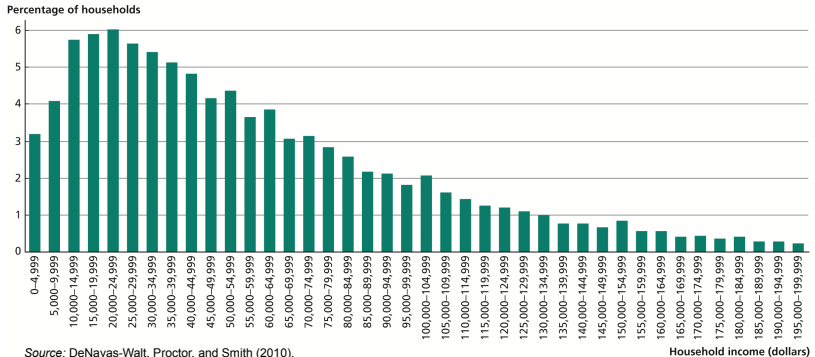
Income Distribution in the UK
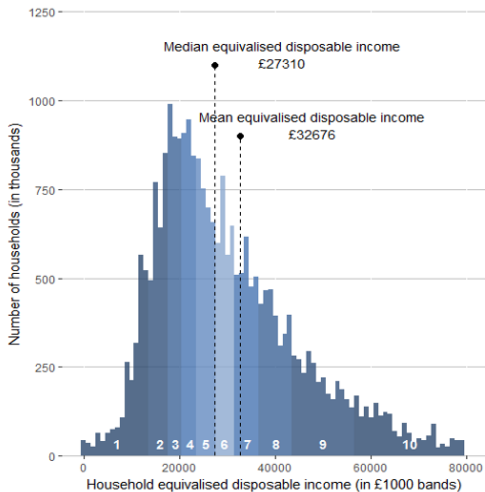
Source: ONS, 2017 data

Growth of Real Disposable Household Income by Decile, United Kingdom

Our World in Data

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.
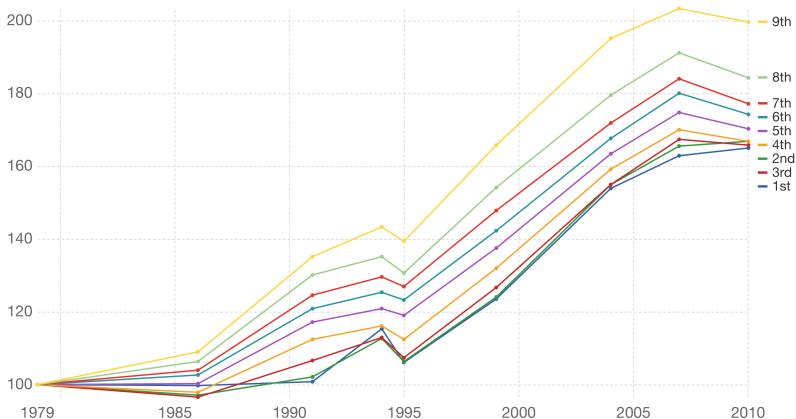
Source: Incomes across the Distribution Database (authored by Nolan, Thewissen, Roser; based on LIS) indexed to the first year (2016)
Note: Adjusted for household size, inflation and price differences between countries and expressed in 2011 international dollars. 1st decile is the cutoff income between the 10% of the population with the lowest income etc.
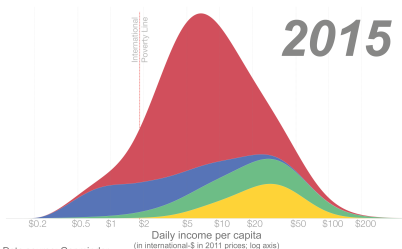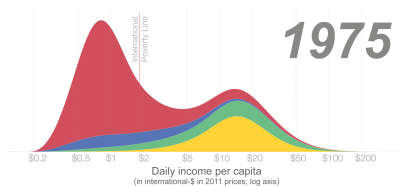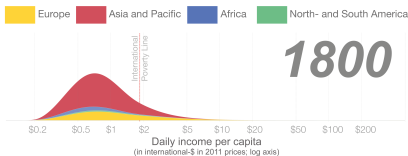OurWorldInData.org/income-inequality/ • CC BY-SA

Global income distribution in 1800, 1975, and 2010

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.

Legend: Europe · Asia and Pacific · Africa · North- and South America

1800
Daily income per capita
(in international-$ in 2011 prices; log axis)

1975
Daily income per capita
(in international-$ in 2011 prices; log axis)

2015
Daily income per capita
(in international-$ in 2011 prices; log axis)

Data source: Gapminder

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.

Figure 13.2: The Lorenz Curve for the United States, 2009

Cumulative percentage of household income

Line of perfect equality

Lorenz curve

49.8%

26.6%

12.0%

3.4%

Cumulative percentage of households
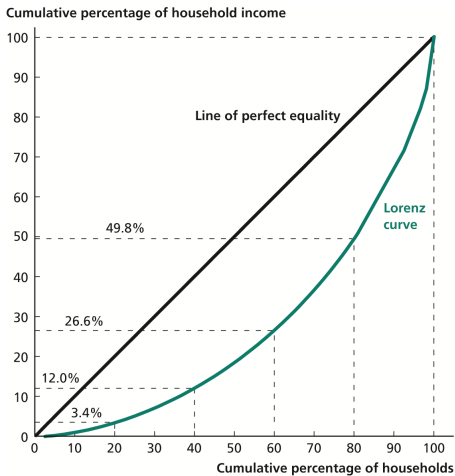
Source: De Navas-Walt, Proctor, and Smith (2010).

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 $= 0$
- Perfect inequality: Gini coefficient $= 1$
- The closer is the coefficient to zero, the more income is distributed equally in a country
- Gini coefficient in the US: .468
- Gini coefficient in the UK: .34 (in 2014, World Bank)

Figure 13.3: The Kuznets Curve

Simon Kuzents' hypothesis (1955): as a country develops, inequality should first rise and then fall
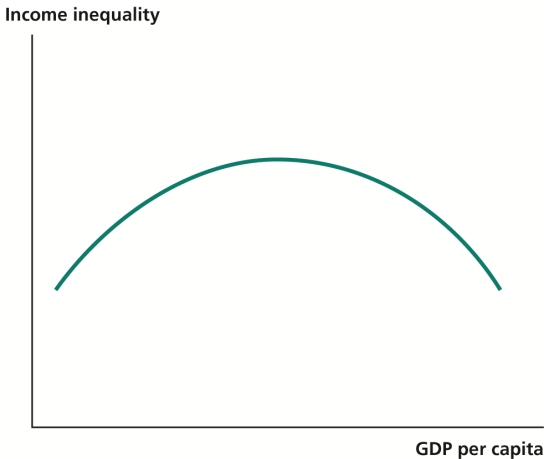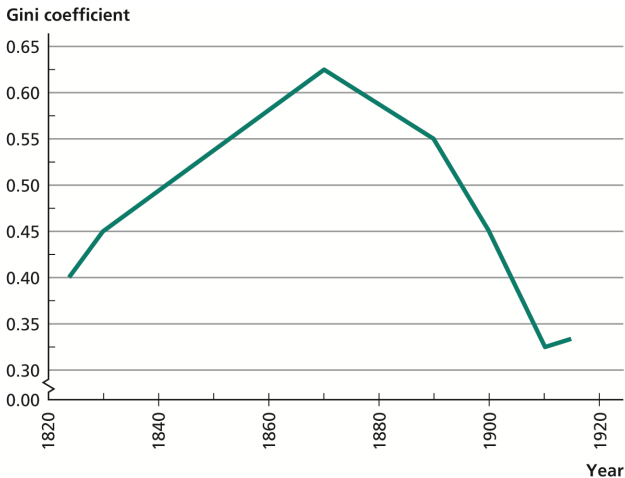
Figure 13.4: The Kuznets Curve in England and Wales, 1823–1915

Gini coefficient

Figure 13.5: Income per capita versus Inequality

Gini coefficient

Comoros, Haiti, Honduras, Seychelles, Nicaragua, South Africa, Brazil, Mexico, Chile, Congo, Dem. Rep., Russia, United States, Egypt, Pakistan, Ethiopia, Ukraine, Hungary, Norway, Sweden

GDP per capita, 2009 (2005 International Dollars, ratio scale)
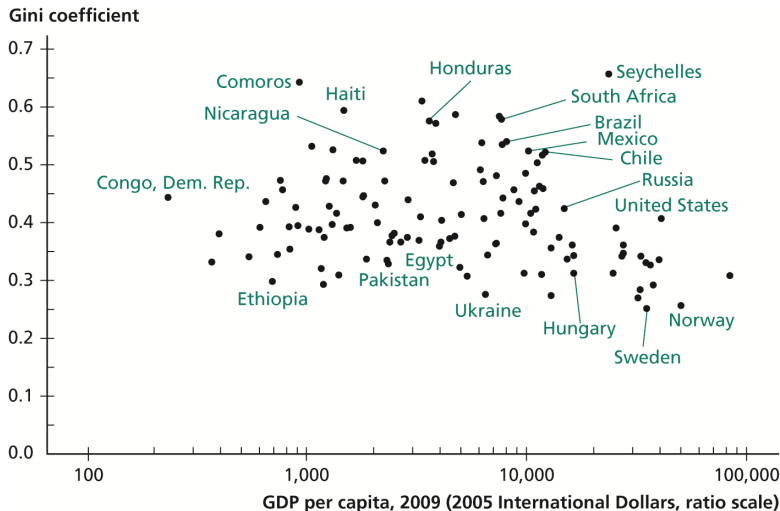
Source: *World Development Indicators* database, Heston et al. (2011).

Kuznets Curve

- The data in Figure 13.5 does not provide strong evidence of the inverted U-shape relationship between development and income inequality

- Some researchers (Barro for example) argue that once you control for other factors that affect inequality, the inverted U-shape is observed.

Sources of Income Inequality

Why is there income inequality?
Characteristics that effect income

- ownership of physical capital: inheritance, investment
- human capital: health, education
- occupation specific skills/talent: leadership, artistic skills, language skills etc.
- geography/location: where you live
- matching of characteristics with economic environment

Education as the 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

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
- 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

# Figure 13.10: Income Inequality in the United States: 1947-2009
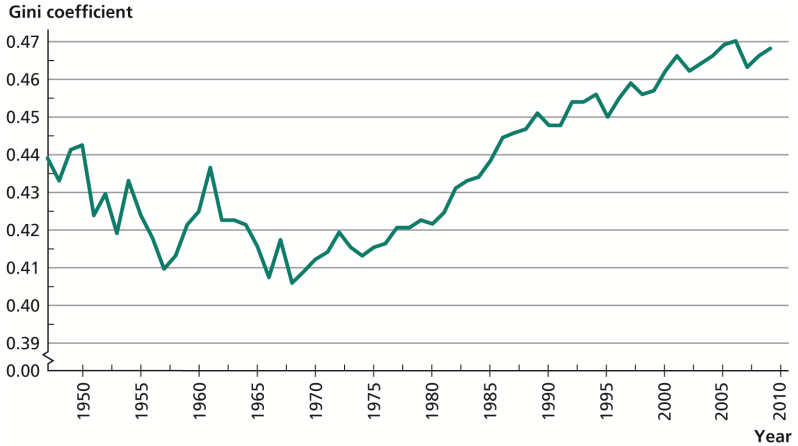
Explaining the Recent Rise in Income Inequality

- 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%, 1900-2010

The evolution of inequality in English speaking countries followed a U-shape
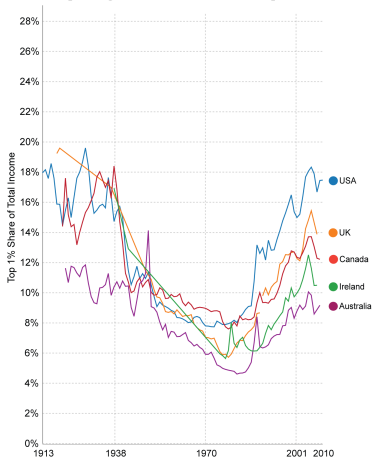
The evolution of inequality in continental Europe and Japan followed an L-shape

USA
UK
Canada
Ireland
Australia

Germany
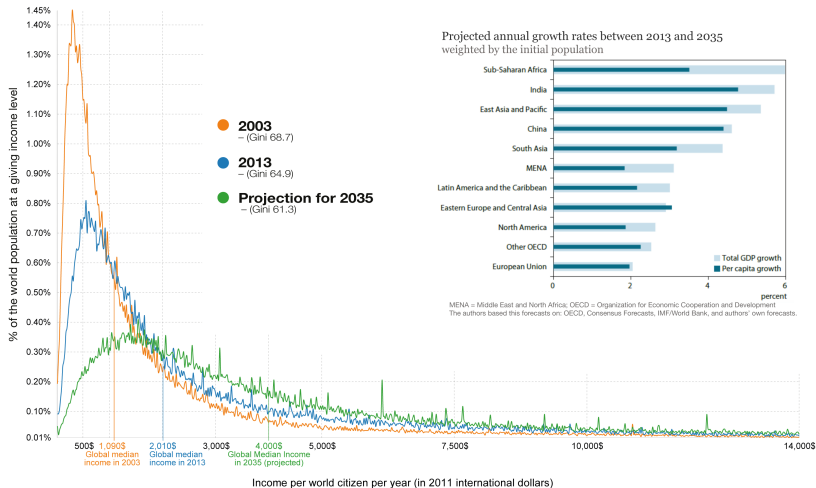Japan
France
Sweden
Denmark
Netherlands
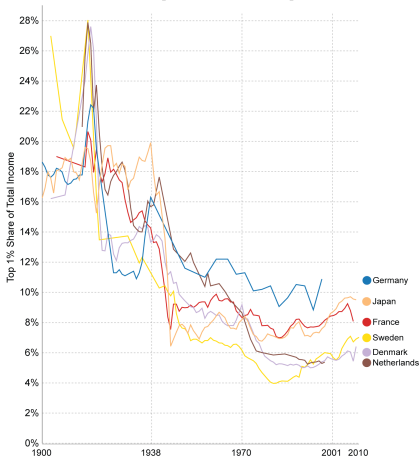
Data source: The World Top Incomes Database.

The interactive data visualisation is available at OurWorldInData.org. There you find the raw data and more visualisations on this topic.

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).

2003
– (Gini 68.7)

2013
– (Gini 64.9)

Projection for 2035
– (Gini 61.3)

% of the world population at a giving income level

Income per world citizen per year (in 2011 international dollars)

500$ 1.090$ 2.010$ 3.000$ 4.000$ 5.000$ 7.500$ 10,000$ 14,000$

Global median income in 2003

Global median income in 2013

Global Median Income in 2035 (projected)

Projected annual growth rates between 2013 and 2035
weighted by the initial population

Sub-Saharan Africa
India
East Asia and Pacific
China
South Asia
MENA
Latin America and the Caribbean
Eastern Europe and Central Asia
North America
Other OECD
European Union

Total GDP growth
Per capita growth

percent

MENA = Middle East and North Africa; OECD = Organization for Economic Cooperation and Development
The authors based this forecasts on: OECD, Consensus Forecasts, IMF/World Bank, and authors' own forecasts.

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

Table 13.2: Saving Rates by Income Quintile, 2003

| Income Quintile	Median Saving Rate (%)
1 (Lowest)	9.0
2	13.5
3	17.2
4	19.2
5 (Highest)	24.4

Source: Dynan, Skinner, and Zeldes (2004), Table 3. Data are for households with heads aged 30–59.

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

Figure 13.11: Marginal Products of Physical and Human Capital

Marginal product

Physical capital

Human capital

I^*

Quantity invested by one person
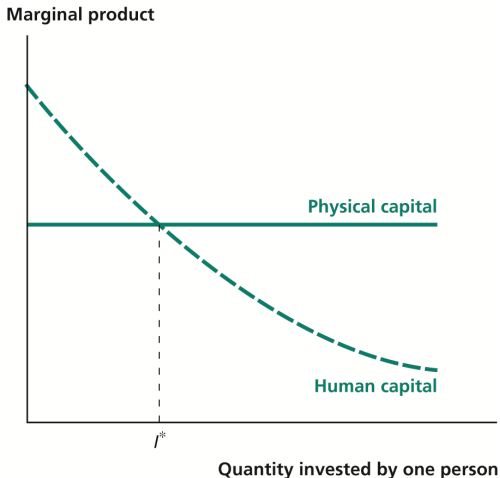
Effects of Inequality on Human Capital Accumulation

- 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: .78
- Gini coefficient for years of education: .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
  - effects of inequality on human capital remain

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