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# INEQUALITY

EE461, SEM2/2019



## NOTE

- Inequality exists across many dimensions, including income, wealth, education, health, and other opportunities. We have focused primarily on inequalities in wealth and income, both because they have been studied extensively by economists and because they are strongly related to other forms of inequality.

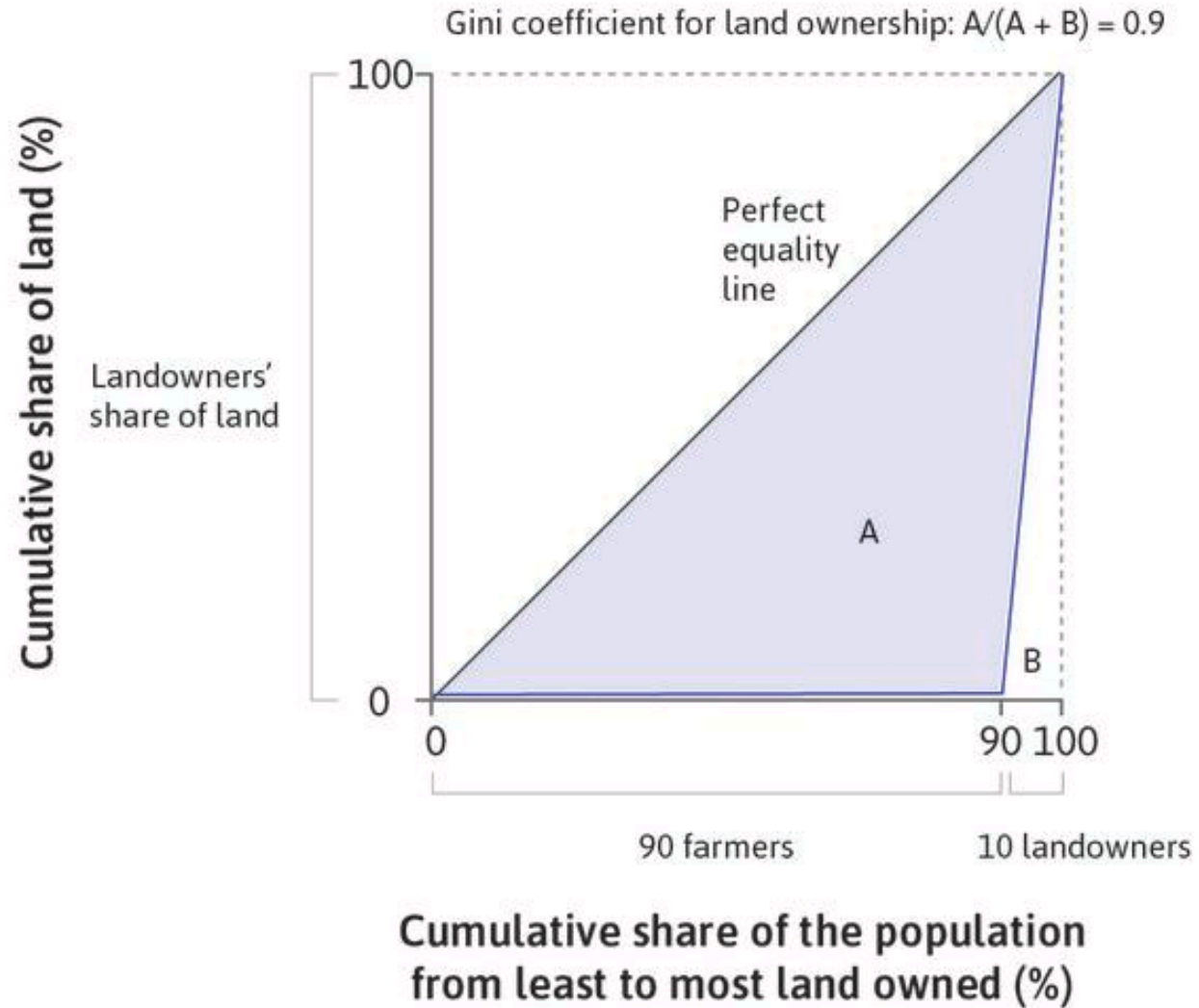


# OUTLINE

- Anecdotes on gini coefficient
- Inequality across the world and over time
- Evaluating fairness
- How much inequality is too much or too little?
- Models of the causes of economic inequality in order to understand how public policies and other changes can alter the degree of economic inequality

# ANECDOTES ON GINI COEFFICIENT

- Gini can also be calculated based on wealth, and other measures of income.
- This is an area approach used to calculate gini.



## AN ALTERNATIVE APPROACH TO CALCULATE GINI: *INEQUALITY AS DIFFERENCES AMONG PEOPLE*

- To calculate *gini coefficient*, you should know the incomes of every member of a population:
  1. Find the difference in income between every possible pair in the population.
  2. Take the mean of these differences.
  3. Divide this number by the mean income of the population, to get the relative mean difference.
  4. *Gini coefficient* = relative mean difference divided by two.
  
- **Examples:** There are just two individuals in the population and one has all the income. Assume their incomes are 0 and 1.
  1. The difference between the incomes of the pair = \_\_\_\_\_.
  2. This is the mean difference because there is just one pair.
  3. Mean income = \_\_\_\_\_, so the relative mean difference = \_\_\_\_\_.
  4.  $g = 2/2 = 1$  (perfect inequality, as we would expect).

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- **Examples:** Two people are dividing a pie: one has 20%, and the other 80%.
  1. The difference is\_\_\_\_\_.
  2. This is the mean difference (there are only two incomes, as before).
  3. Mean income is 50% or 0.50. The relative mean difference is\_\_\_\_\_.
  4.  $g =$ \_\_\_\_\_.

- The Gini coefficient is defined as the half of the relative mean differences in incomes between all pairs of people in a population.
- The Gini coefficient is a measure of how unequal their slices are.
- If the size of the smaller slice of the pie is  $\sigma$ ,  $g = \underline{\hspace{2cm}}$ .

## AN ALTERNATIVE APPROACH TO CALCULATE GINI: *INEQUALITY AS DIFFERENCES AMONG PEOPLE*

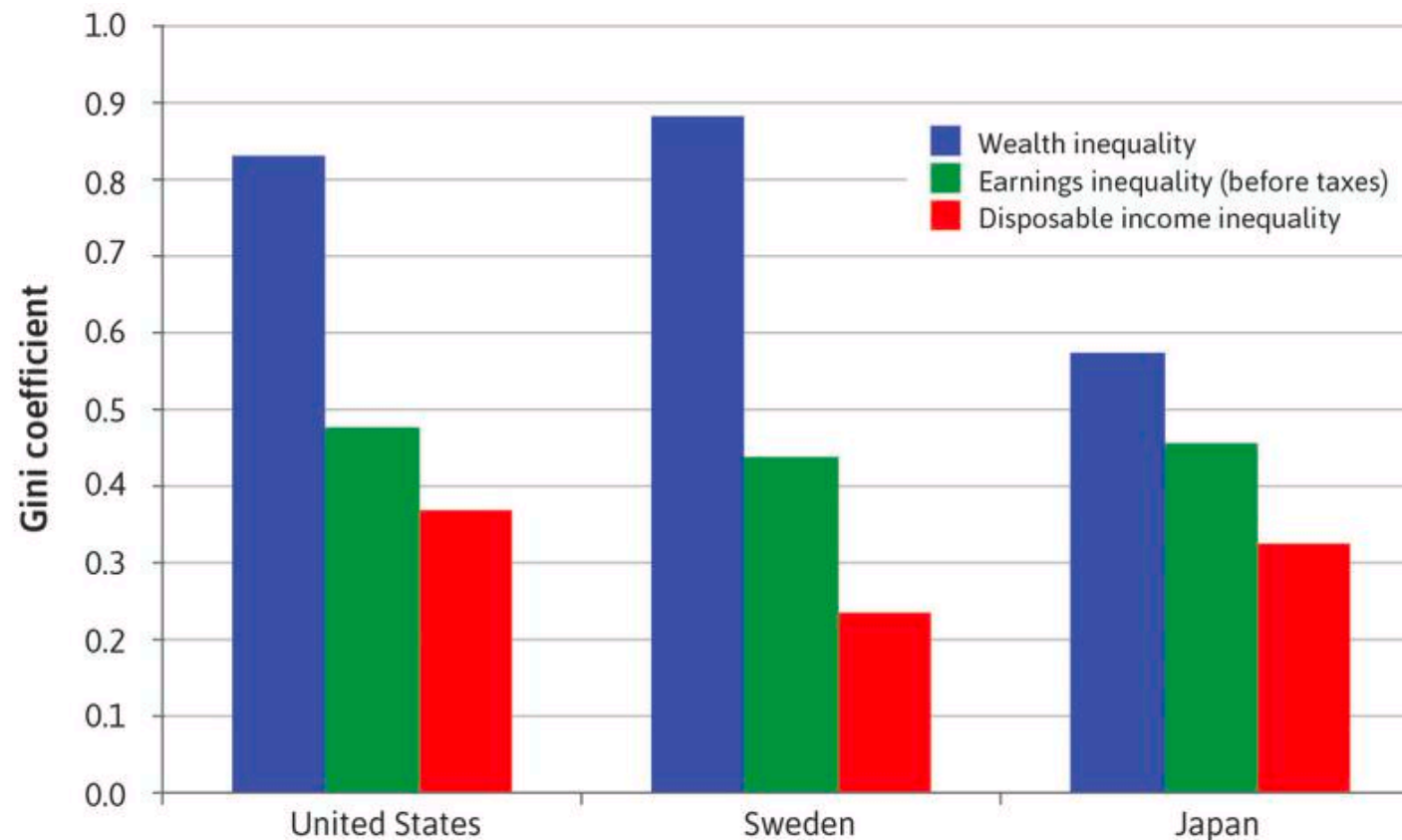
- Suppose there are  $n$  possible pairs from the population
- $\bar{y}^r = \frac{\sum_{i=1}^n y_i^r}{n}$  is the average incomes of the richer of each of the pairs
- $\bar{y}^p = \frac{\sum_{i=1}^n y_i^p}{n}$  is the average incomes of the poorer of each of the pairs
- Across all of the pairs in the population or across a large random sample of the population, the better off of the two is on average  $\bar{y}^r / \bar{y}^p$  times richer than the less well off.
- $\frac{\bar{y}^r}{\bar{y}^p} = \frac{1}{1-g}$  where  $g$  is the gini coefficient.
- If the Gini coefficient is 0.62, then across all of the pairs in the population or across a large random sample of the population, the better off of the two is on average 4.26 times richer than the less well off.

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# WEALTH, EARNINGS, DISPOSABLE INCOME

- Wealth is the value of the assets owned by a household (net of their debts).
- Earnings are income from labour, including from wages, salaries, and self-employment.
- Market income is the sum of:
  - all income received as earnings
  - all income received from business owned by the household or from investments
- Disposable income is the income that a family can spend:
  - after paying taxes
  - after receiving any monetary transfers from the government such as unemployment benefit and pensions

# INEQUALITY IN WEALTH, EARNINGS, AND DISPOSABLE INCOME: US, SWEDEN, AND JAPAN (2000S)



Mattia Fochesato and Samuel Bowles. 2015. '[Nordic exceptionalism? Social democratic egalitarianism in world-historic perspective](#)'. *Journal of Public Economics* 127: pp. 30–44. Santa Fe Institute; Mattia Fochesato and Samuel Bowles. 2017. '[Technology, Institutions and Wealth Inequality in the Very Long Run](#)'. Santa Fe Institute; Chen Wang and Koen Caminada. 2011. '[Leiden Budget Incidence Fiscal Redistribution Dataset](#)'. Version 1. Leiden Department of Economics Research., <https://www.core-econ.org/the-economy/book/text/19.html#191-inequality-across-the-world-and-over-time>

## INEQUALITY IN WEALTH, EARNINGS, AND DISPOSABLE INCOME: US, SWEDEN, AND JAPAN (2000S)

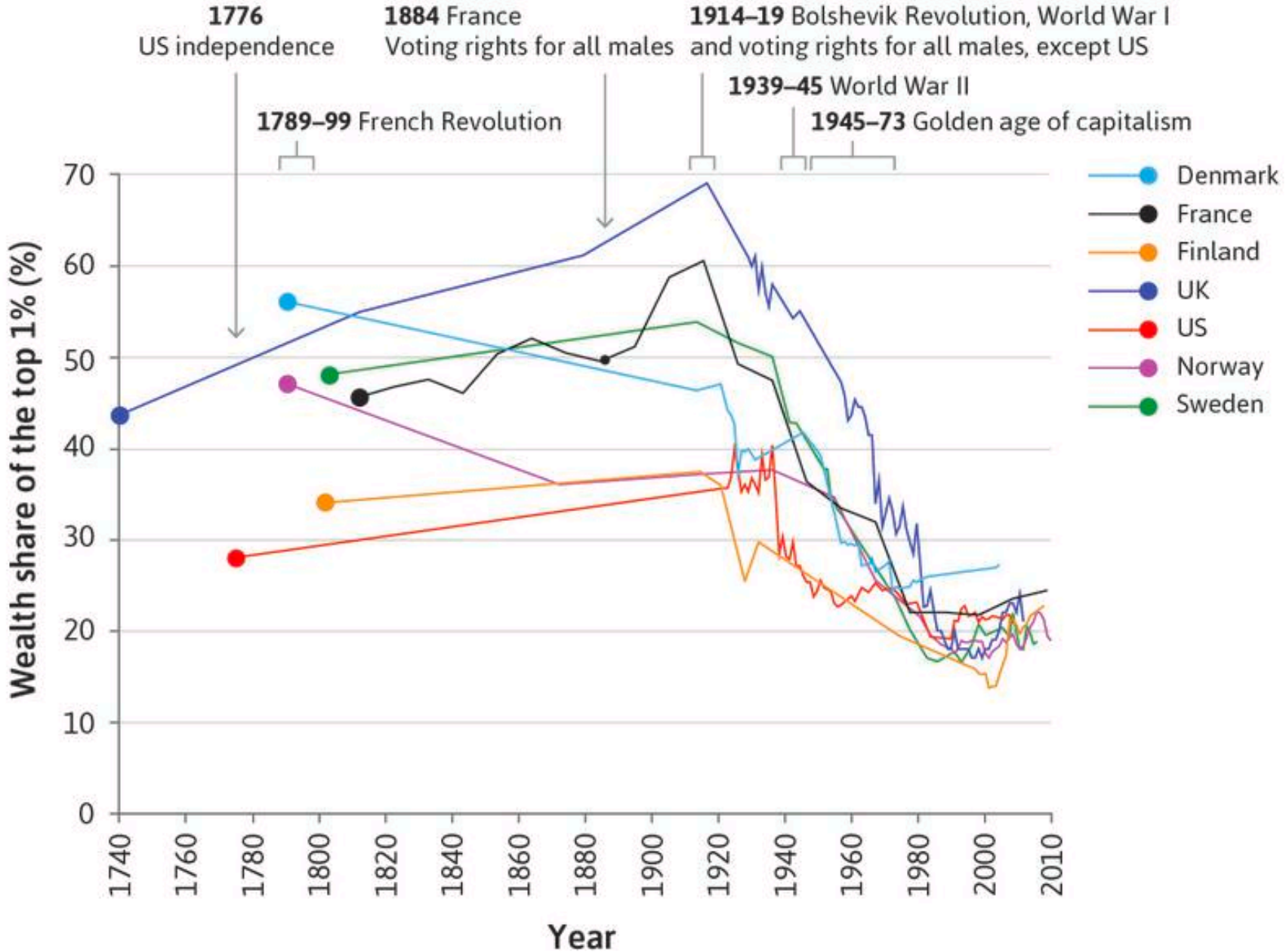
- *Wealth is much more unequally distributed than earnings, and earnings are much more unequally distributed than disposable income:* Though the differences among the three measures of inequality are much smaller in Japan than in Sweden and the US.
- *Sweden has much lower disposable income inequality than the other two countries:* This is due to its relatively modest inequality in earnings and more importantly, to its system of taxes and transfers which benefits the less well off. It is not due to greater equality in Sweden's distribution of wealth. As you can see from the graph, wealth is distributed almost as unequally in Sweden as in the US.

# INCOME INEQUALITIES OVER TIME AND AMONG COUNTRIES

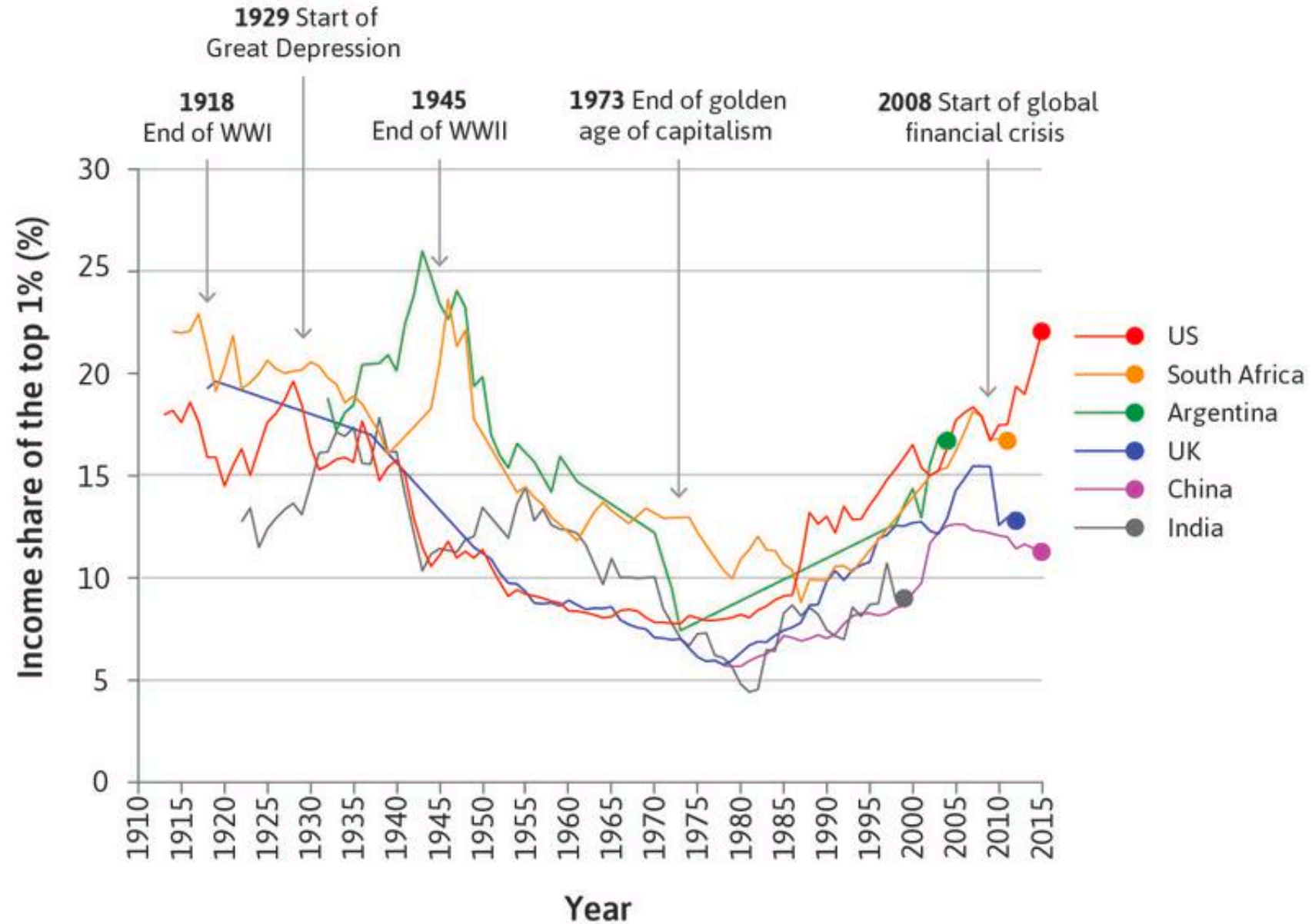
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- Another way to measure inequality focuses on the very rich, providing an answer to the question: what fraction of total income or wealth belongs to the richest 1% or 10% of the population? This indicator has the advantage that it can be measured over hundreds of years, because the very rich have long been required to pay taxes, and hence we have reasonably good information on their incomes and wealth.

# INEQUALITIES OVER TIME AND AMONG COUNTRIES



# INCOME INEQUALITIES OVER TIME AND AMONG COUNTRIES



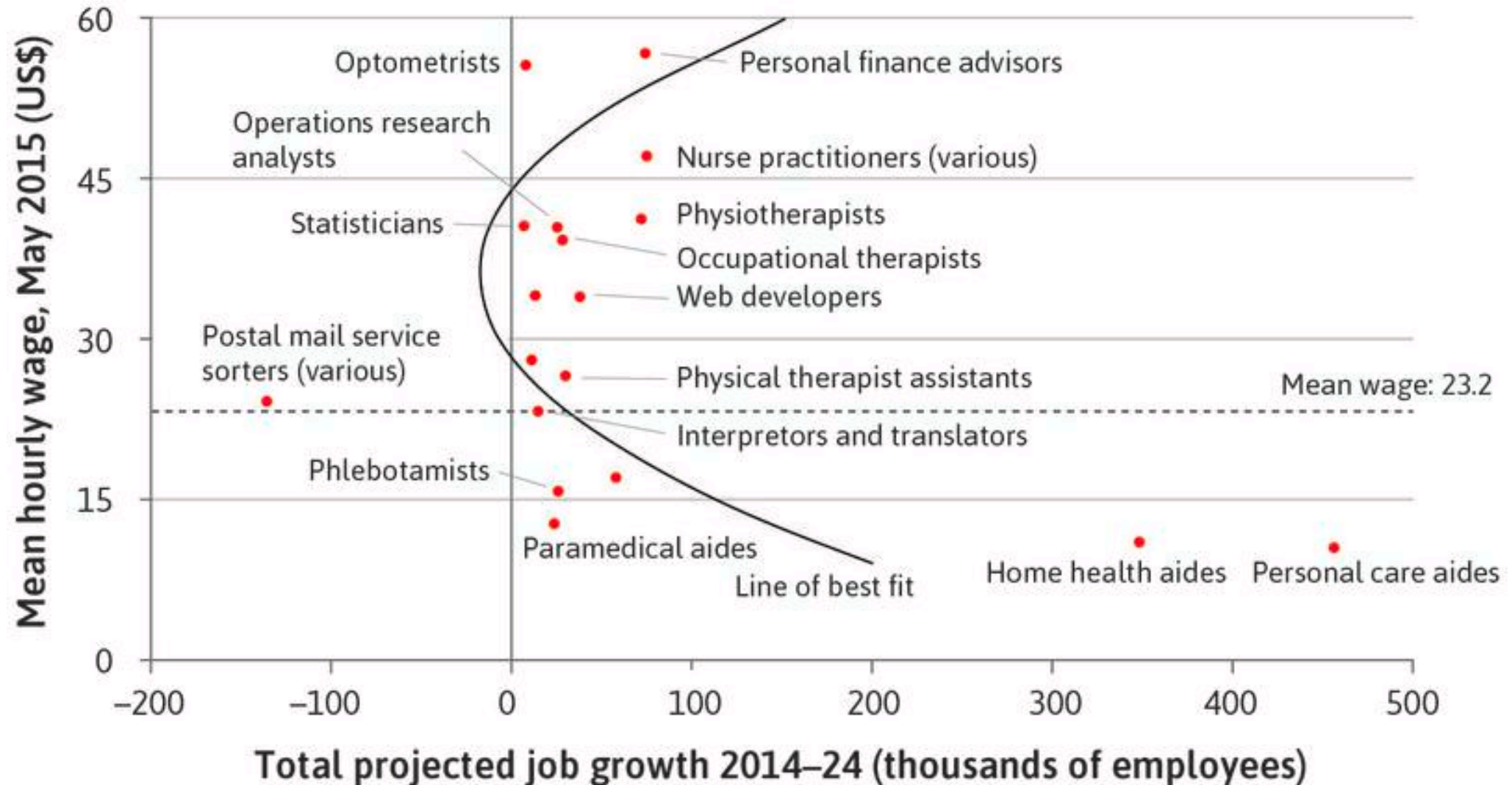
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## INCOME INEQUALITIES OVER TIME AND AMONG COUNTRIES

- There appear to be three distinct periods: the eighteenth and nineteenth centuries up to about 1910 show increasing wealth inequality (excepting Norway and Denmark), the twentieth century until 1980 shows decreasing wealth inequality, and the period since shows a modest increase in wealth inequality.
- *There are common trends across most of the countries for which we have data:* For example, a fall in inequality between 1920 and 1980.
- *Countries differ greatly in what happened since 1980:* In some of the world's largest economies—China, India, and the US—inequality rose steeply, while in others—Denmark, France, and the Netherlands—inequality remained close to historically modest levels.

# THE MISSING MIDDLE?

- Low-paying jobs and high-paying jobs have increased in number while middle-income jobs have become scarcer.

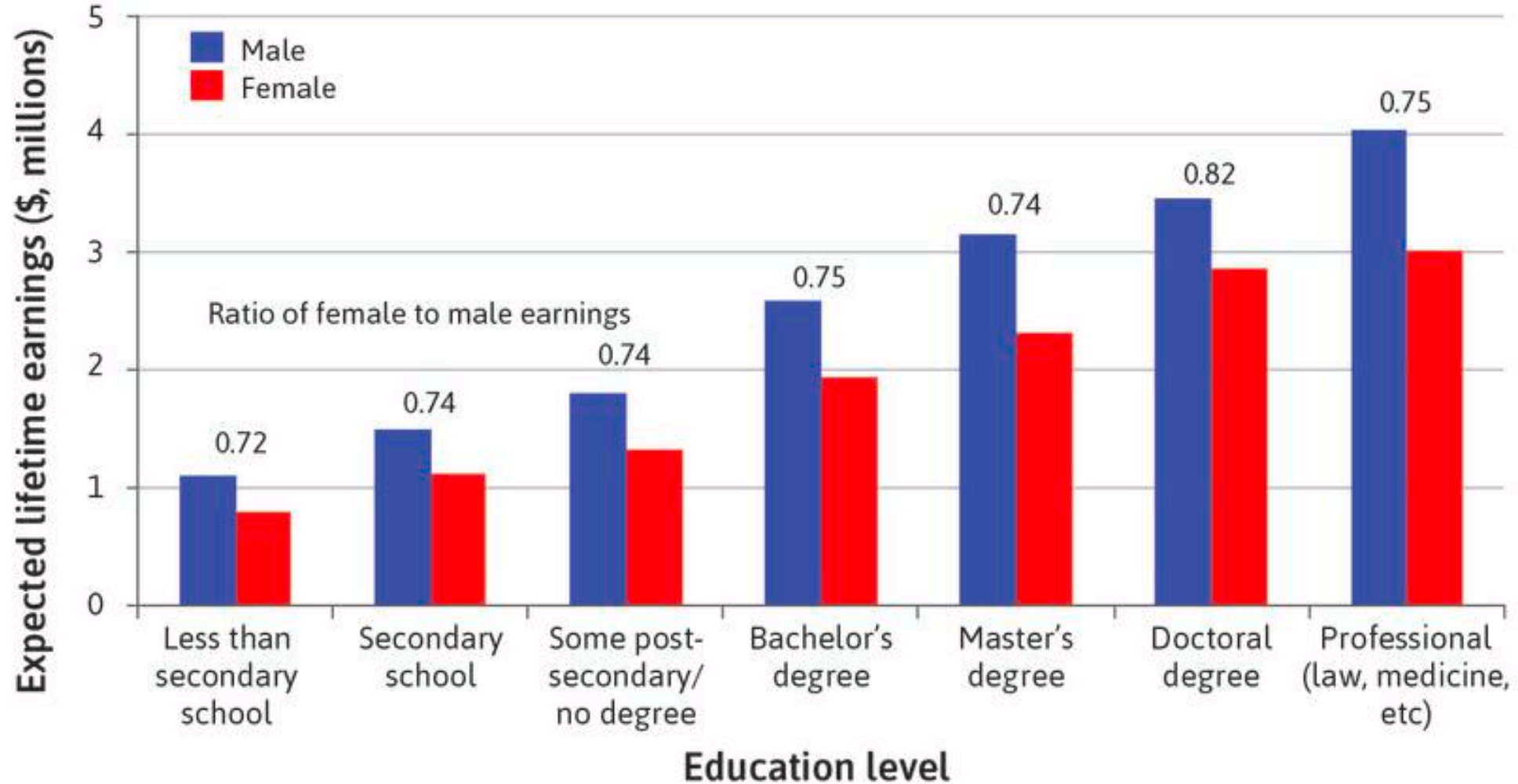




## ACCIDENTS OF BIRTH AND \_\_\_\_\_

- Part of inequality can be traced to differences among people in things over which they have virtually no control, such as their race, caste, sex, nation, or parents.
- **Categorical inequality or group inequality** is inequality between particular social groups identified, for instance, by a category such as race, nation, caste, gender or religion.
- Categorical inequalities are for the most part based on accidents of birth, because one is born into membership in one of the categories, and switching category is typically difficult if not impossible.

# ACCIDENTS OF BIRTH AND CATEGORICAL INEQUALITY



# INTERGENERATIONAL INEQUALITY

**Intergenerational transmission of economic differences:**

The processes by which the economic status of the adult sons and daughters comes to resemble the economic status of the parents.

**Intergenerational inequality:**

The extent to which differences in parental generations are passed on to the next generation, as measured by the intergenerational elasticity or the intergenerational correlation

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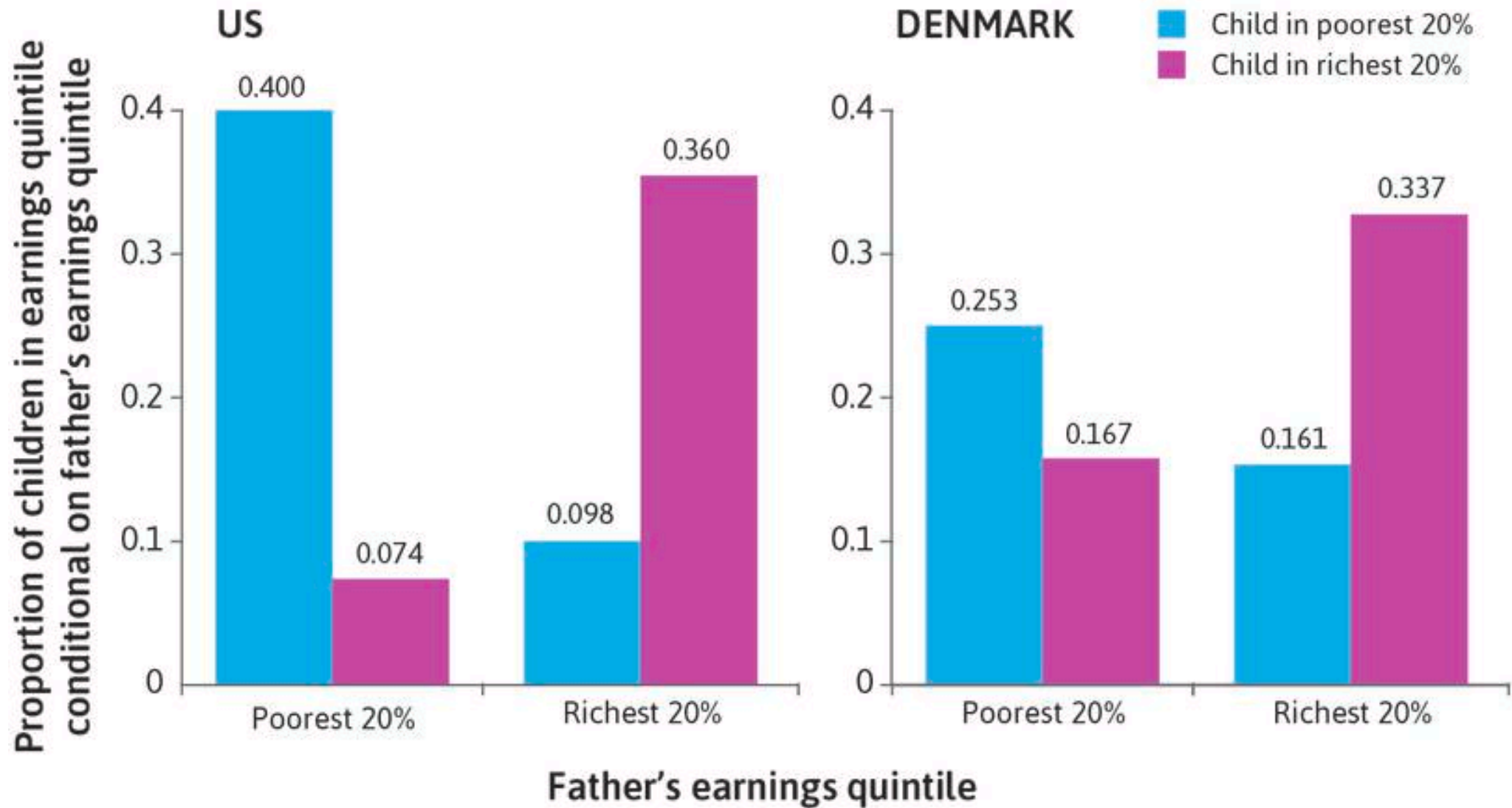
# INTERGENERATIONAL INEQUALITY

- Intergenerational inequality is measured by ranking parents by their incomes or wealth, and then looking at what income or wealth their kids end up with when they become adults.
- **Intergenerational elasticity:** When comparing parents and grown offspring, the percentage difference in the second generation's status that is associated with a 1% difference in the adult generation's status.

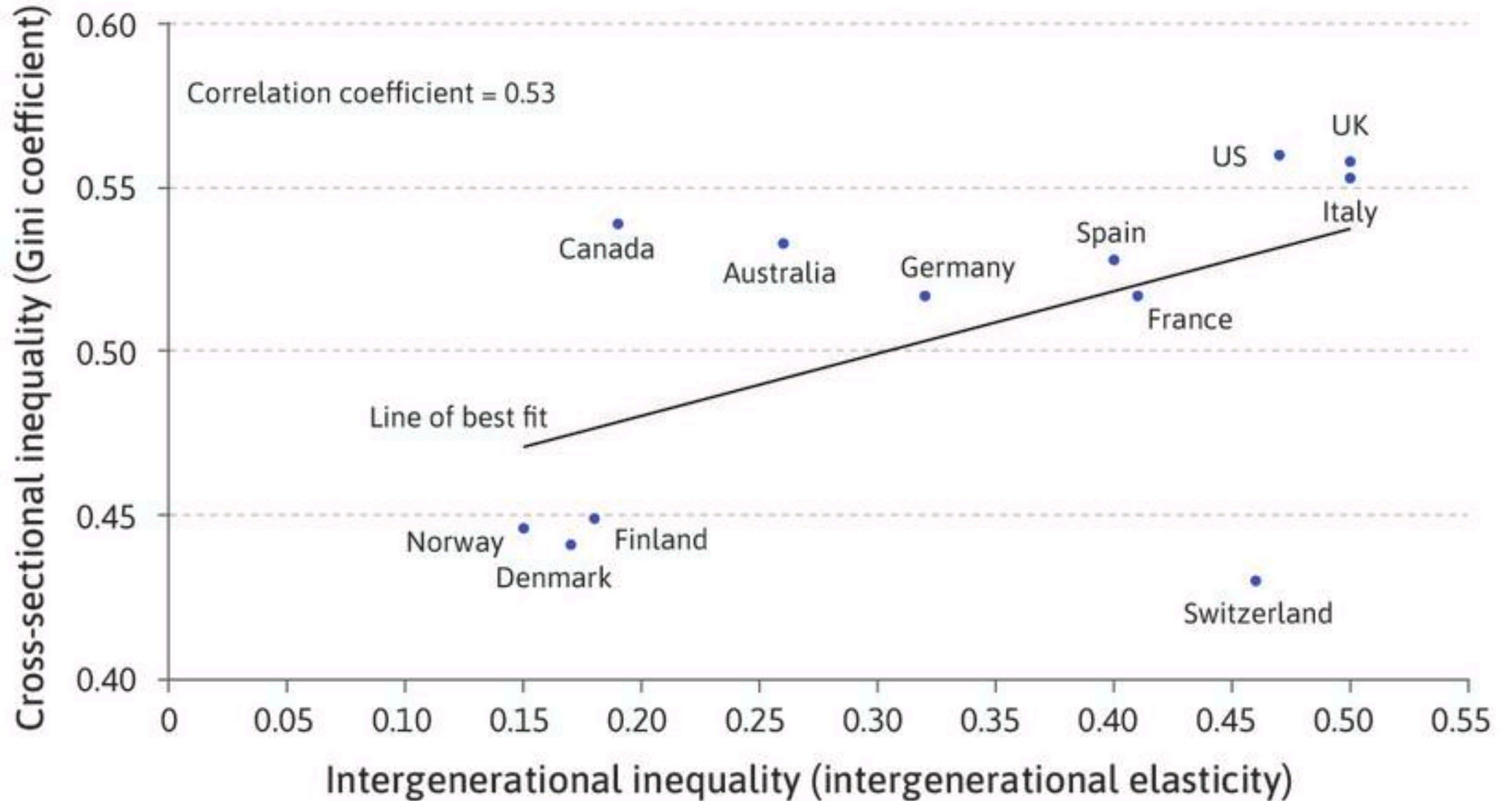
# INTERGENERATIONAL INEQUALITY

- In a society with a \_\_\_\_\_ intergenerational elasticity, **intergenerational mobility is \_\_\_\_\_.**
- Intergenerational mobility is changes in the relative economic or social status between parents and children. Upward mobility occurs when the status of a child surpasses that of the parents. Downward mobility is the converse.
- Another widely used measure of intergenerational mobility is the correlation between the positions of parents and children (for example, in their years of schooling or income).
- Kids whose parents had a high income are likely to grow up to have high incomes themselves, and kids from low-income families are likely to have low incomes as adults.

# INTERGENERATIONAL INEQUALITY



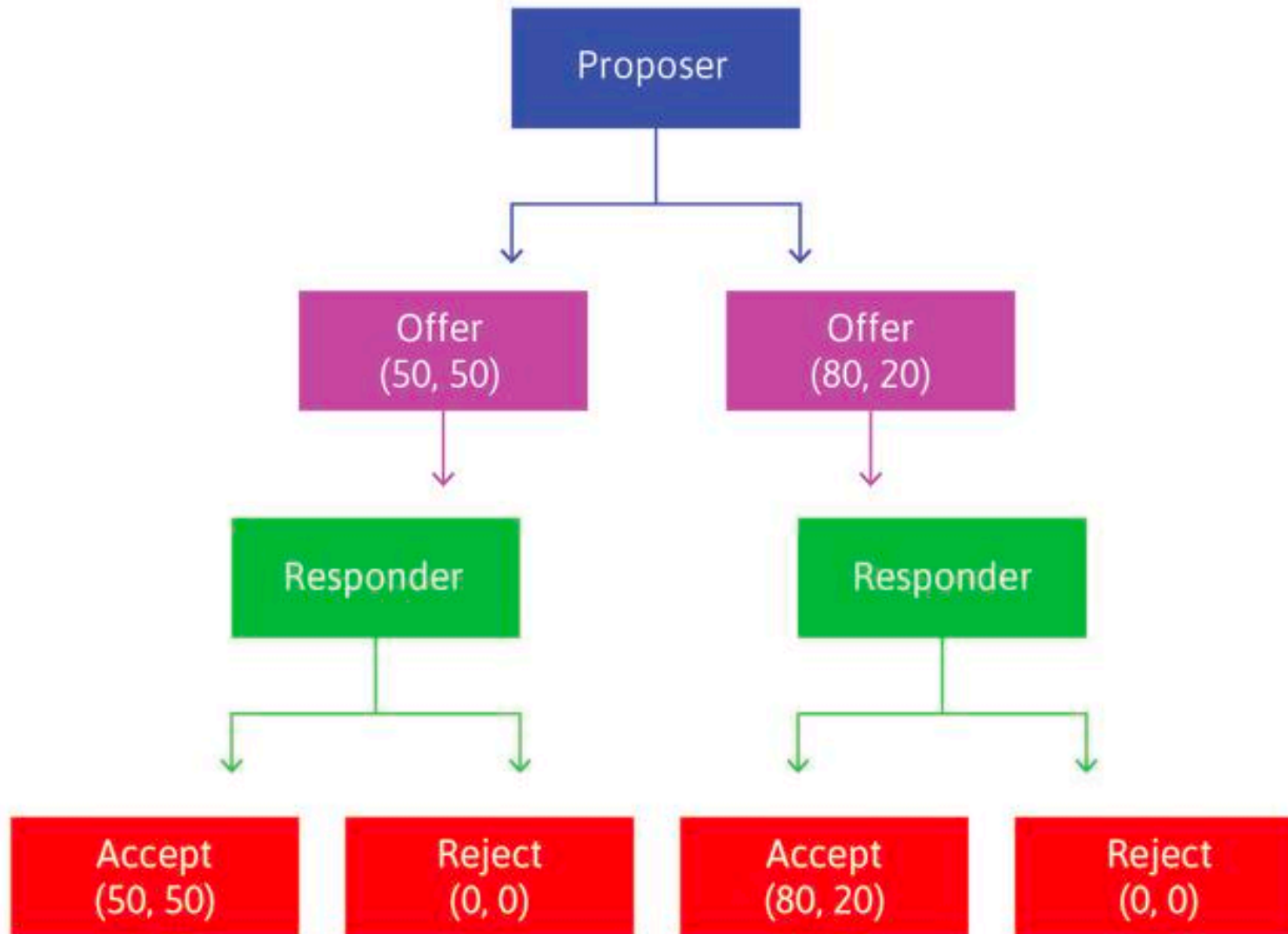
# INTERGENERATIONAL INEQUALITY



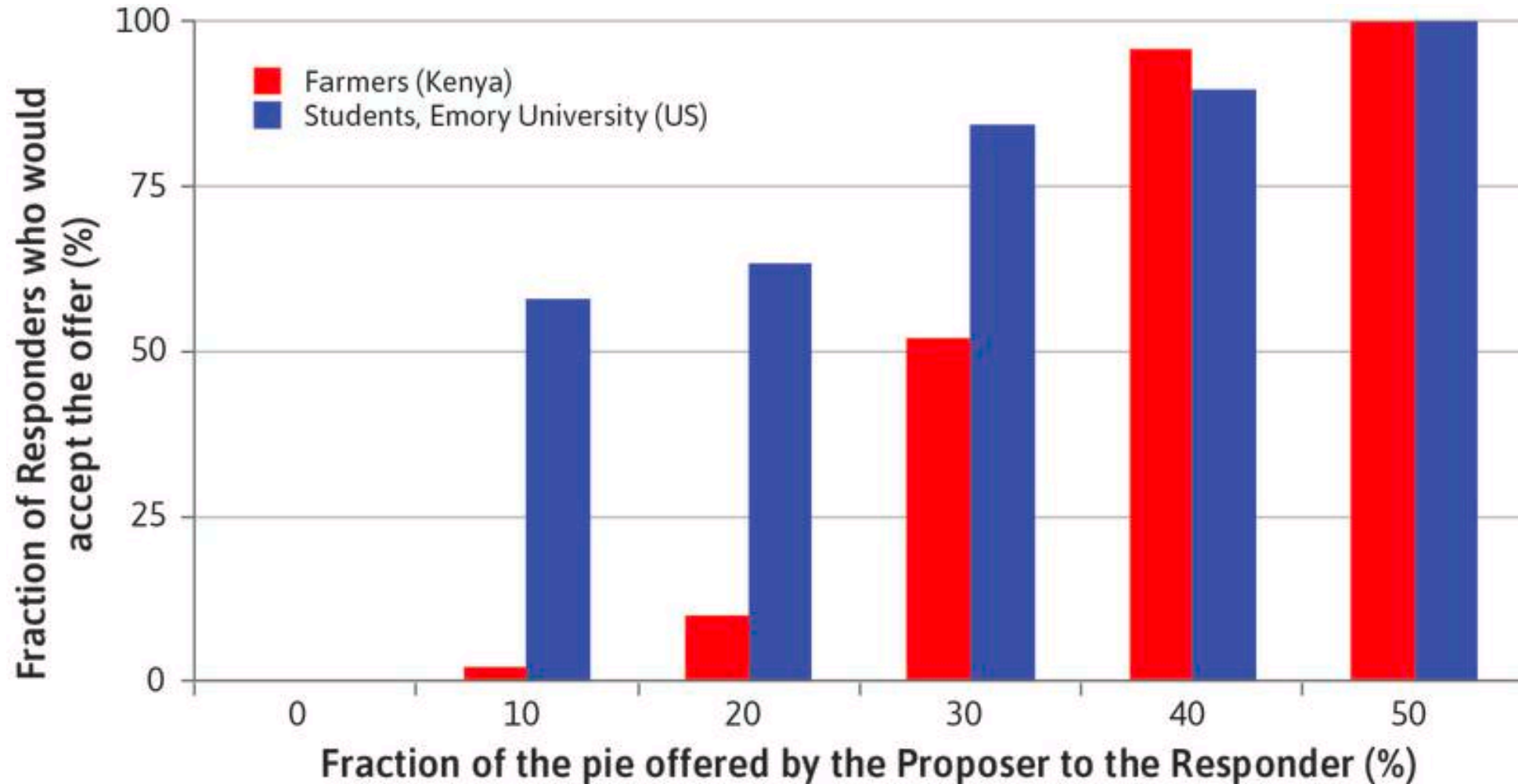
## EVALUATING FAIRNESS: IS IT FAIR?

- **ULTIMATUM GAME:** a two-person one-shot game known as the ultimatum game. It has been used around the world with experimental subjects including students, farmers, warehouse workers, and hunter-gatherers.
  - Two players A (proposer) and B (responder)
  - A is endowed with some amount ( $x$ ) of a good (usually money).
  - A makes an offer to B consisting of a transfer of  $y < x$ .
  - B accepts or rejects the offer.
  - Payoffs (Take-it-or-leave-it):
    - B accepts: A:  $x-y$ , B:  $y$
    - B rejects: everyone 0

# WHAT IS FAIR?: ULTIMATUM GAME



# WHAT IS FAIR?: ULTIMATUM GAME



<https://www.core-econ.org/the-economy/book/text/04.html#411-fair-farmers-self-interested-students>

Adapted from Joseph Henrich, Richard McElreath, Abigail Barr, Jean Ensminger, Clark Barrett, Alexander Bolyanatz, Juan Camilo Cardenas, Michael Gurven, Edwina Gwako, Natalie Henrich, Carolyn Lesorogol, Frank Marlowe, David Tracer, and John Ziker. 2006. 'Costly Punishment Across Human Societies'. *Science* 312 (5781): pp. 1767–1770.

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## WHAT IS FAIR?

- Allocations can be judged unfair because of:
- *How unequal they are*: In terms of income, for example, or subjective wellbeing. These are \_\_\_\_\_ **judgements of fairness**.
- **substantive judgements of fairness** Judgements based on the characteristics of the allocation itself, not how it was determined.
- *How they came about*: For example by force, or by competition on a level playing field. These are \_\_\_\_\_ **judgements of fairness**.
- **procedural judgements of fairness** An evaluation of an outcome based on how the allocation came about, and not on the characteristics of the outcome itself, (for example, how unequal it is).

# WHAT IS FAIR?

- **Substantive judgements of fairness** is based on inequality in some aspect of the allocation such as income, happiness, freedom.
- **Procedural judgements of fairness:** The rules of the game that brought about the allocation may be evaluated according to aspects such as:
  - *Voluntary exchange of private property acquired by legitimate means:* Was fraud or force involved?
  - *Equal opportunity for economic advantage:* Were people subjected to some kind of discrimination or other disadvantage because of their race, sexual preference, gender, or who their parents were?
  - *Deservingness:* To which extent did an individual work hard, or otherwise uphold social norms?

## WHAT IS FAIR?: JOHN RAWLS'S THEORY OF JUSTICE(1971)

- *We adopt the principle that fairness applies to all people:* We apply exactly the same standard of justice to EVERYONE to evaluate the outcome.
- *Imagine \_\_\_\_\_:* Since fairness applies to everyone, including ourselves, Rawls asks us to imagine ourselves behind what he called a veil of ignorance, not knowing the position that we would occupy in the society we are considering. We could be male or female, healthy or ill, rich or poor (or with rich or poor parents), in a dominant or an ethnic minority group, and so on.
- *From behind the veil of ignorance, we can make a judgement:* For example, the choice of a set of institutions—imagining as we do so that we will then become part of the society we have endorsed, with an equal chance of having any of the positions occupied by individuals in that society.



# CHOOSING SOCIAL CONTRACTS FROM BEHIND THE VEIL OF IGNORANCE

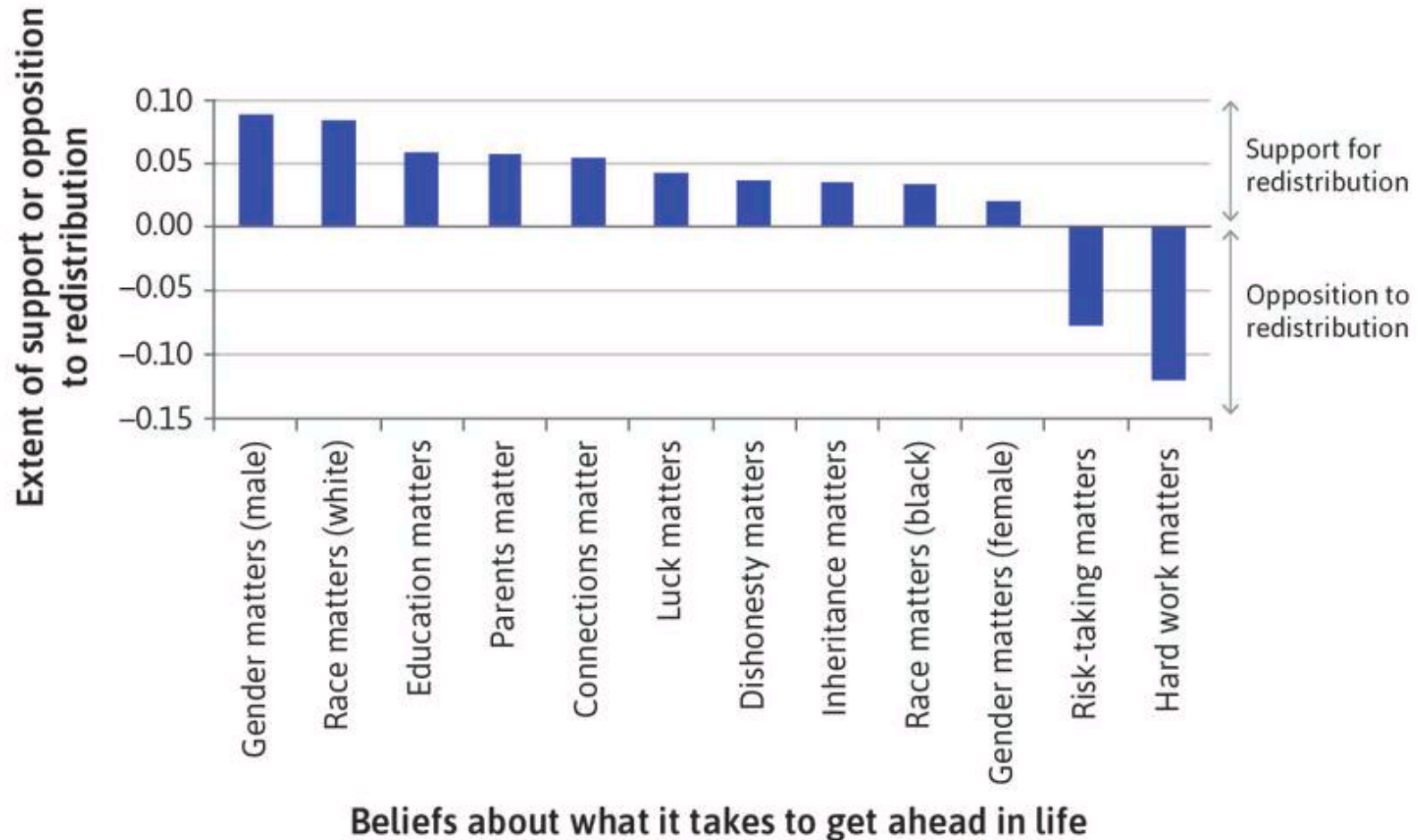
- Transport yourself to a hypothetical world in which you (perhaps along with other fellow citizens) are asked to design your model society.
- There will be two groups or classes of equal size, one called 'richer' and the other 'poorer'.
- You will get to live in the society you design after you have answered the question 'how rich should the richer class be and how poor should the poorer class be?'
- Which class you get to be in will be determined by the flip of a coin *after you have decided how unequal the society will be.*



# HOW MUCH INEQUALITY IS TOO MUCH OR TOO LITTLE?

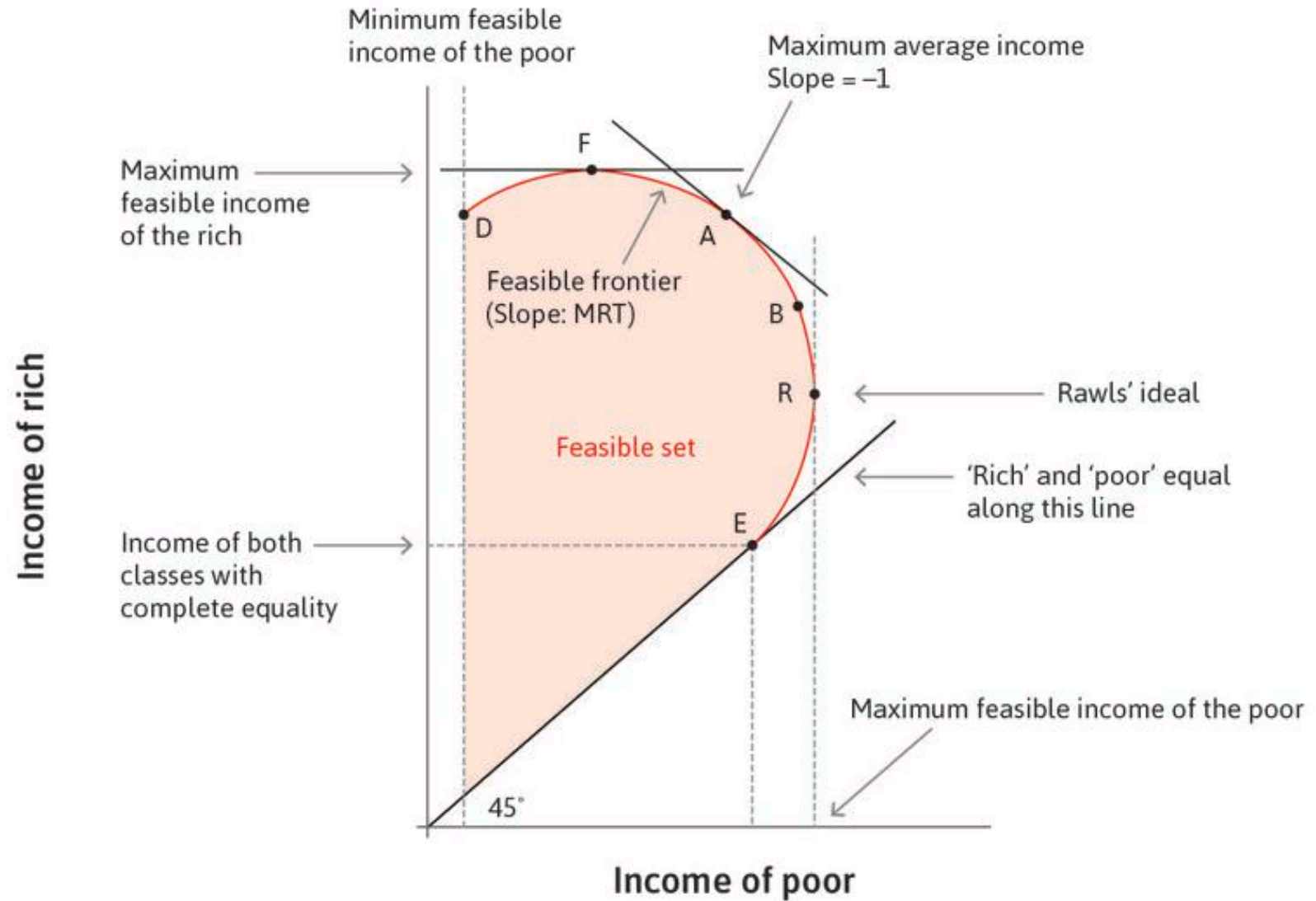
- Many people think inequality is too much or it is unfair if income depends substantially on what we call an ‘accident of birth’ (categorical inequality)—your race, your sex, or your country. Inequalities based on hard work or taking risks are less likely to be seen as a problem.

# HOW BELIEFS ABOUT WHAT IT TAKES TO GET AHEAD PREDICT WHETHER PEOPLE IN THE US SUPPORT OR OPPOSE GOVERNMENT PROGRAMS TO REDISTRIBUTE INCOME TO THE POOR.



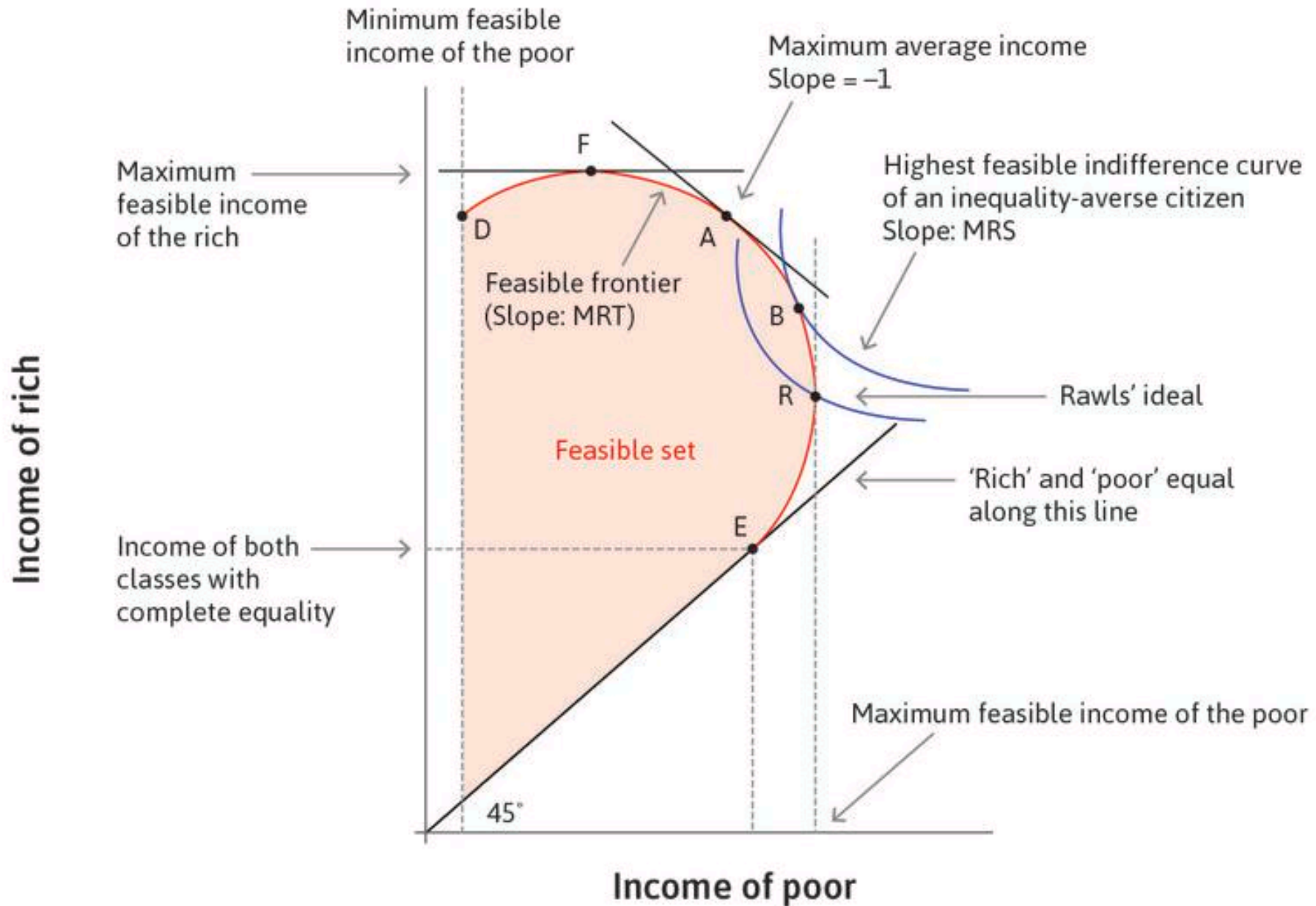
# FEASIBLE INEQUALITY

- \_\_\_\_\_: complete equality
- \_\_\_\_\_: the distribution with the highest income for the poor
- \_\_\_\_\_: the highest average income of rich and poor
- \_\_\_\_\_: the maximum income of the rich
- \_\_\_\_\_: the distribution in which the poor are at their minimum feasible living standard
- Slope of the feasible frontier  
=MRT  
=income gains for the rich/income losses for the poor



# A PREFERENCE FOR FAIRNESS

- D is inferior to F, E is inferior to R
- Consider points between F and R
- An indifference curve gives combinations of the incomes of the two classes that you value equally.
- Curves further away from the origin are preferred (more income for both groups is always better).
- The slope of these indifference curves is the marginal rate of substitution between income for the rich and income for the poor.
- slope of indifference curves =  $MRS = \text{marginal value of poor income} / \text{marginal value of rich income}$
- You would then maximize your utility by finding the point on the feasible frontier at which the marginal rate of transformation is equal to the marginal rate of substitution.



# ENDOWMENT, INSTITUTIONS & POLICIES, TECHNOLOGY

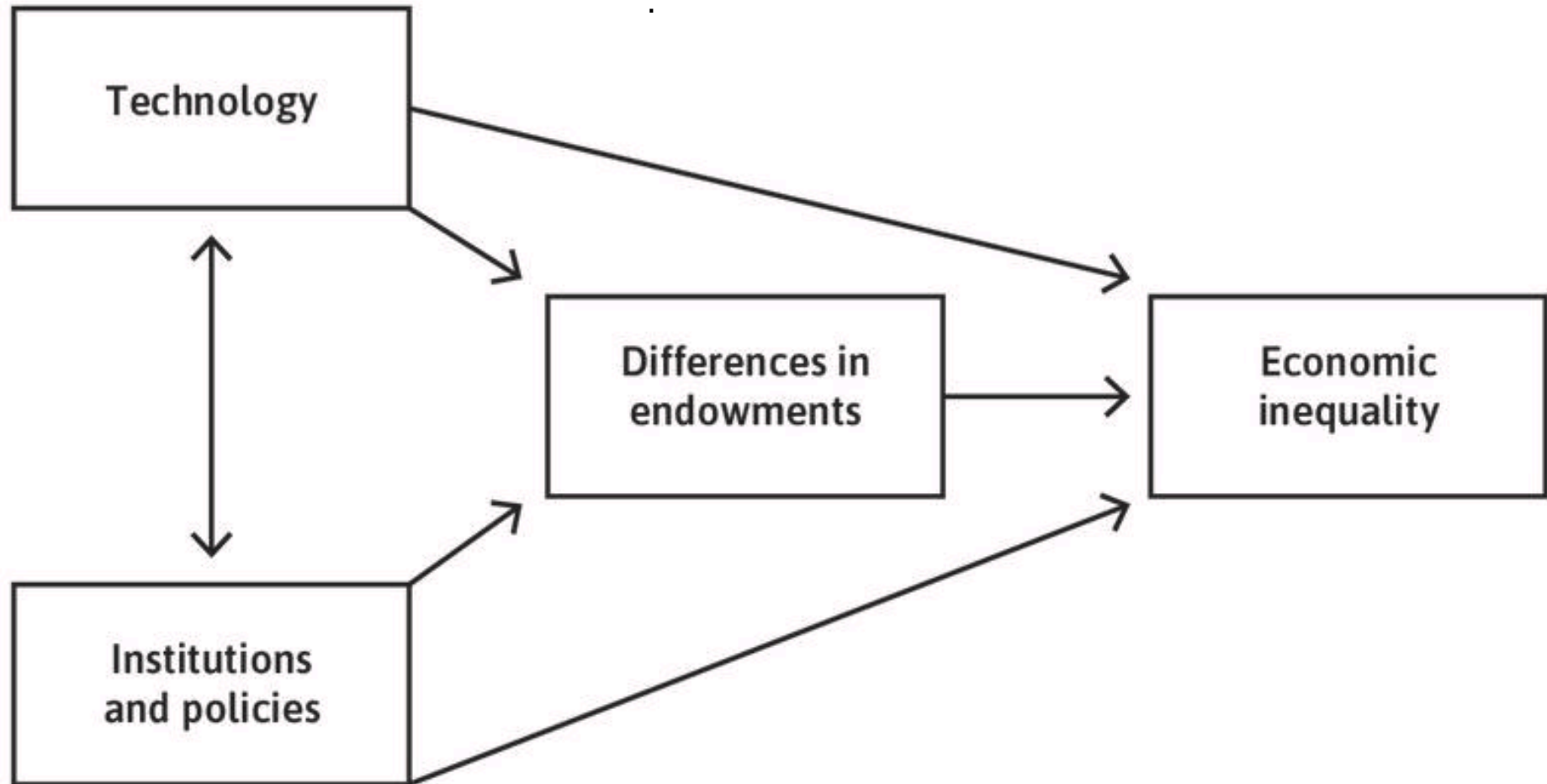
- Endowment: The facts about an individual that may affect his or her income, such as
  - The physical wealth a person has, either land, housing, or a portfolio of shares (stocks).
  - Also includes level and quality of schooling, special training, the computer languages in which the individual can work,
  - Work experience in internships,
  - Citizenship, whether the individual has a visa (or green card) allowing employment in a particular labour market,
  - The nationality and gender of the individual, and
  - The person's race or social class background.
- By studying why people have differing endowments, and what determines the income associated with each of the endowments, we can understand income inequality

# ENDOWMENT, INSTITUTIONS & POLICIES, TECHNOLOGY

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- Institutions and policies
  - Inherited wealth and whether it is (heavily) taxed
  - Subsidized higher education and whether educational policies allow the wealthy to acquire more and better education for their children
  - Exclusive social clubs from elite private universities
  - Gender discrimination
- Technology
  - Where there are strong economies of scale, a few people—the winners—will end up with substantial endowments
  - The technology of digital platforms
  - A labour-saving technology

# ENDOWMENT, INSTITUTIONS & POLICIES, TECHNOLOGY



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