Poverty and Inequity

EC 390 - Development Economics

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Measuring Inequality

What is Poverty and Inequality

We have previously talked about **Absolute Poverty** previously

We can define it again as:

- Not being able to meet basic daily needs for food, shelter, clothing, etc.

Aside from **poverty**, we are interested in how **income is distributed** across individuals

Income Inequality

When thinking of comparing nations, we have measured incomes on national averages which has its own flaws

But how do we measure how income is distributed across individuals?

Income Inequality happens when income is unequal across households

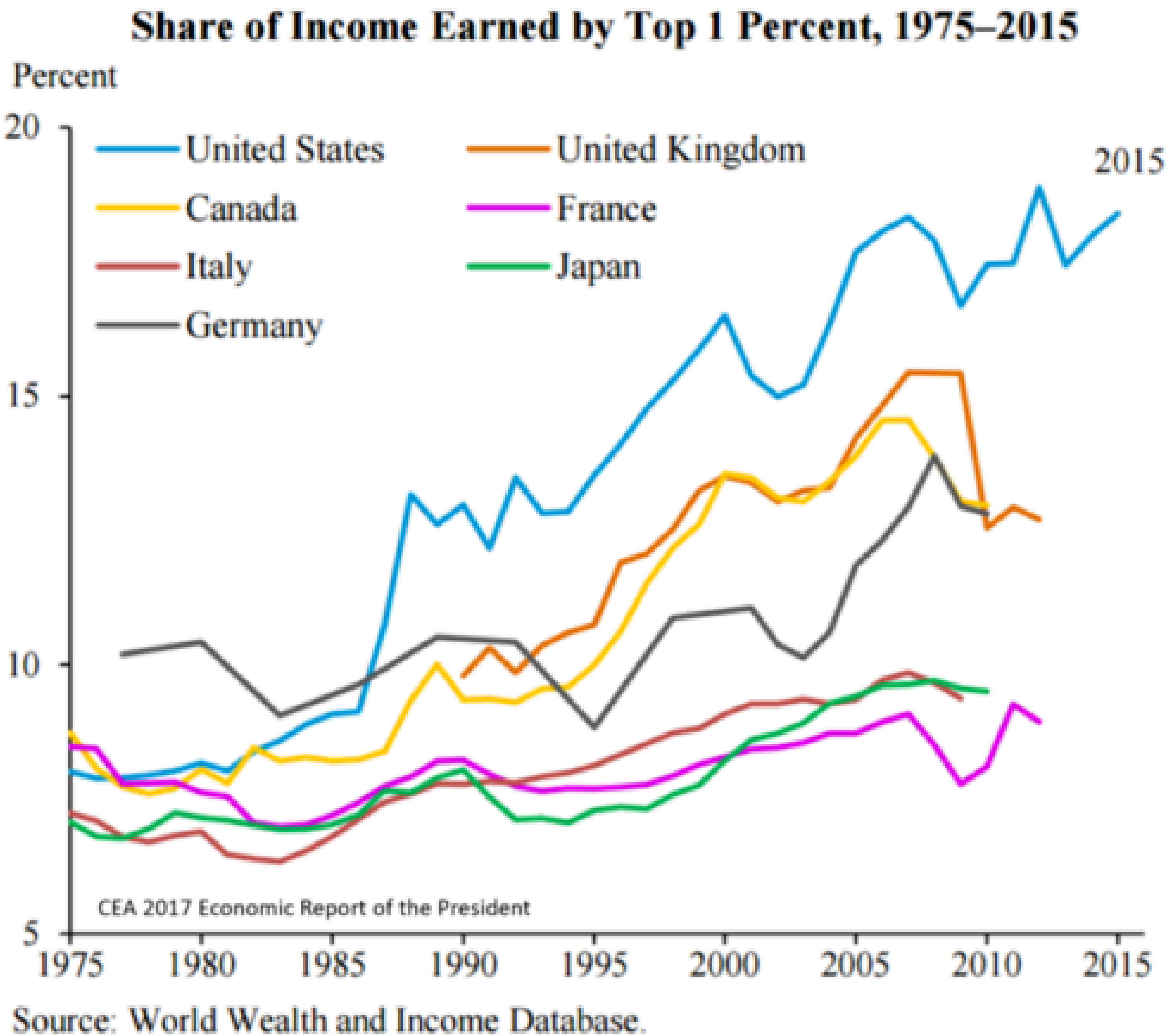
- This creates an income distribution which we can later see where **wealth is concentrated**

Perfect wealth equality would be where everyone has an equal share of wealth

Income Inequality

Is income inequality necessarily bad?

- It depends
- Think of the theoretical outcomes that produce inequalities in societies
  - Economists believe that some level of inequality will naturally exist
  - Different skills will affect how productive someone may be
  - In the most strict sense of economics, individual productions affect how much someone is paid
  - Some inequality may be beneficial, **it incetivizes individuals to increase their productivity/skill**
  - However, if **inequality** interferes with individual's ability to perform basic functions, **then we have a problem**



Share of Income Earned by Top 1 Percent, 1975–2015
Percent
20
15
10
5
United States
United Kingdom
Canada
France
Italy
Japan
Germany
2015
CEA 2017 Economic Report of the President
1975
1980
1985
1990
1995
2000
2005
2010
2015
Source: World Wealth and Income Database.

Income Inequality

How should we **measure inequality? → Not easy to answer**

There are 4 criteria to consider

Anonymity Priniciple:

Scale Independence Principle:

Population Indipendence Principle:

Transfer Principle:

Income Inequality

There are 4 criteria to consider

Anonymity Priniciple:: Measure of inequality should not depend on who has the higher income

Scale Independence Principle:

Population Indipendence Principle:

Transfer Principle:

Income Inequality

There are 4 criteria to consider

Anonymity Priniciple:

Scale Independence Principle: Measure of inequality should not depend on the size of the economy

Population Indipendence Principle:

Transfer Principle:

Income Inequality

There are 4 criteria to consider

Anonymity Priniciple:

Scale Independence Principle:

Population Indipendence Principle: Measure of inequality should not be based on the number of income recipients

Transfer Principle:

Income Inequality

There are 4 criteria to consider

Anonymity Priniciple:

Scale Independence Principle:

Population Indipendence Principle:

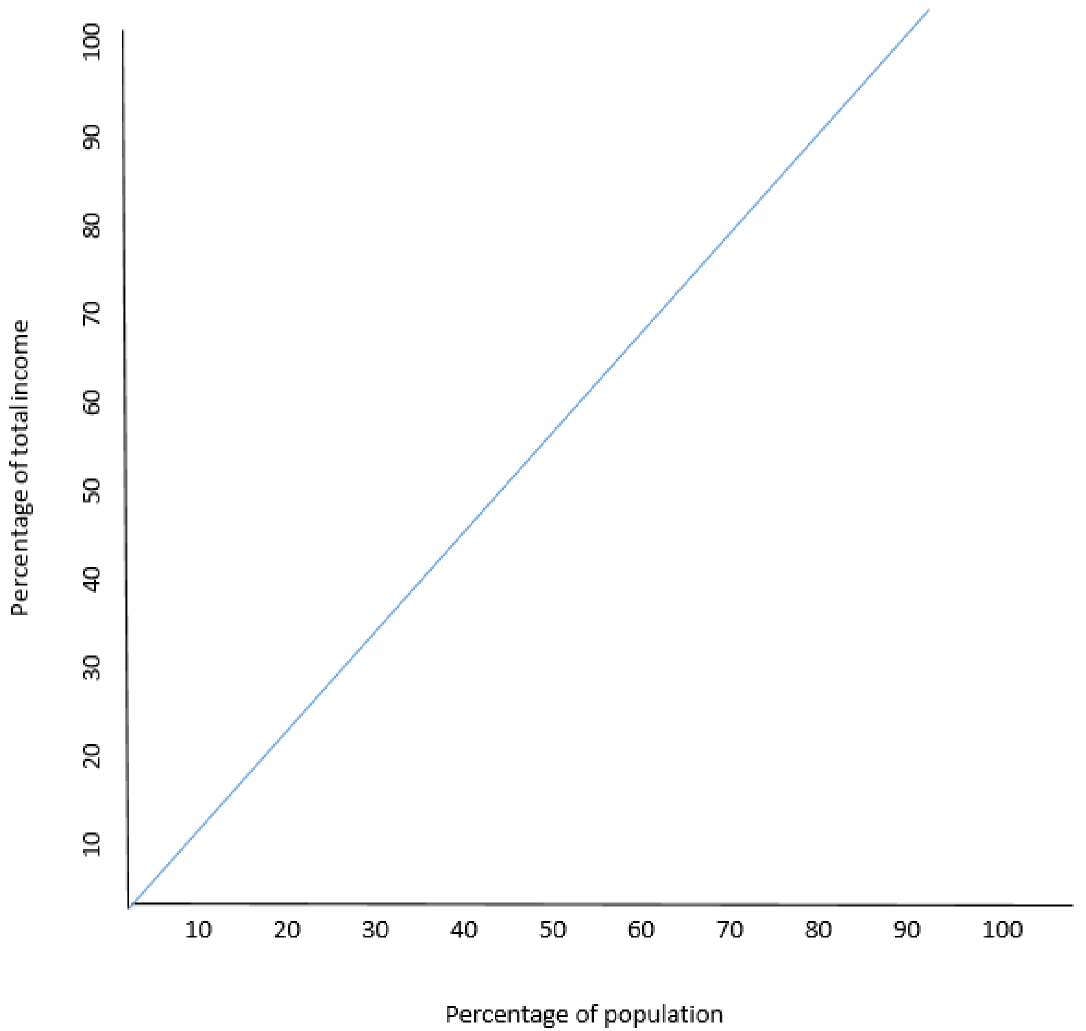
Transfer Principle: Holding all other incomes constant, if we transfer income from rich individuals to poor individuals, we should have more equal income distribution

Income Inequality Visualized

Let there be an economy with **10 people**

- Incomes are: 10, 10, 10, 10, 10, 10, 10, 10, 10, 10
- Average Income: 10
- What percent of total income does the **first person hold?**
  - 10%
- What percent of total income do the **first 5 people hold?**
  - 50%

Perfect Income Equality

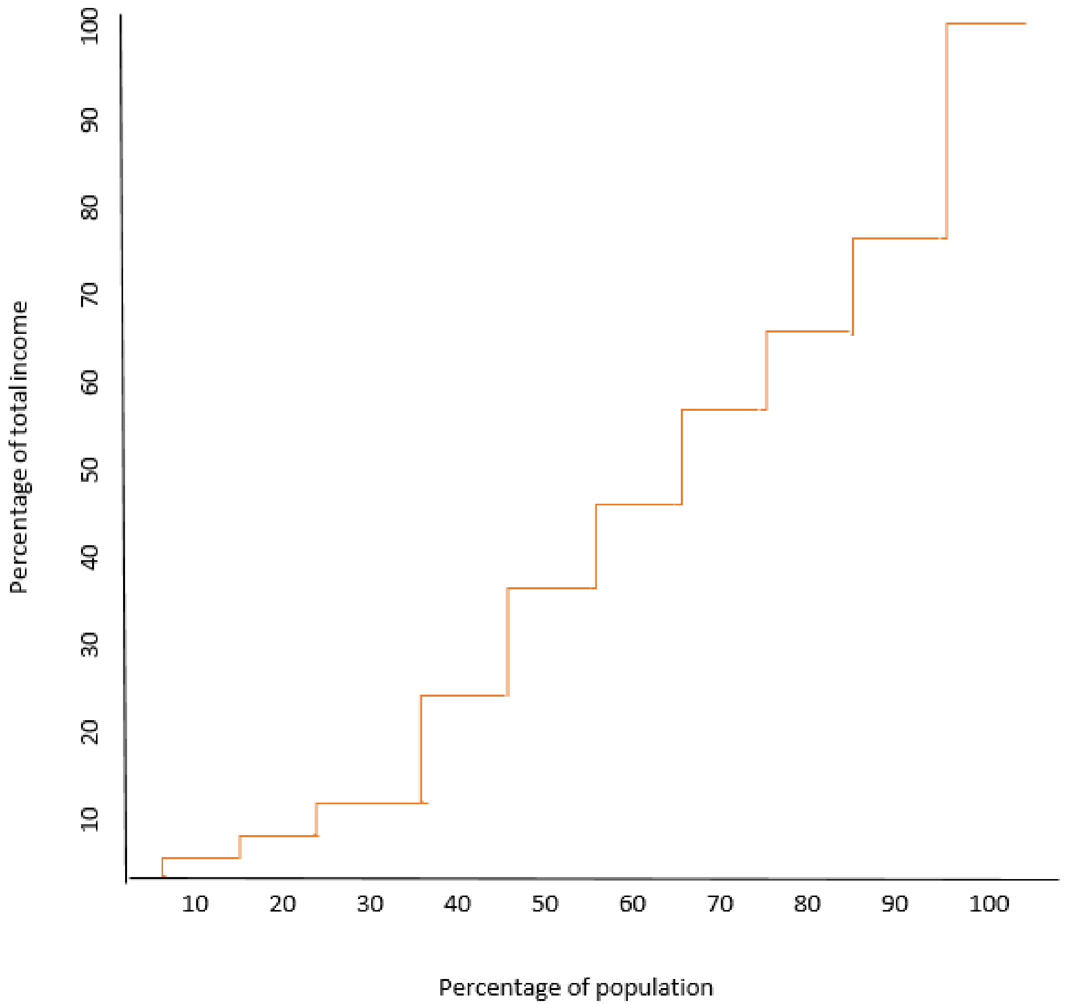


Income Inequality Visualized

Let's change it up. There are still 10 people in the economy

- Incomes are: 5, 5, 5, 10, 10, 10, 10, 10, 10, 25
- Average Income: 10
- What percent of total income does the **first person hold?**
  - $5/100 \Rightarrow 5\%$
- What percent of total income do the **first 5 people hold?**
  - $\dfrac{5+5+5+10+10}{100} \Rightarrow 35\%$
- What percent of total income does the **wealthiest person hold?**
  - 25%

Income Inequality

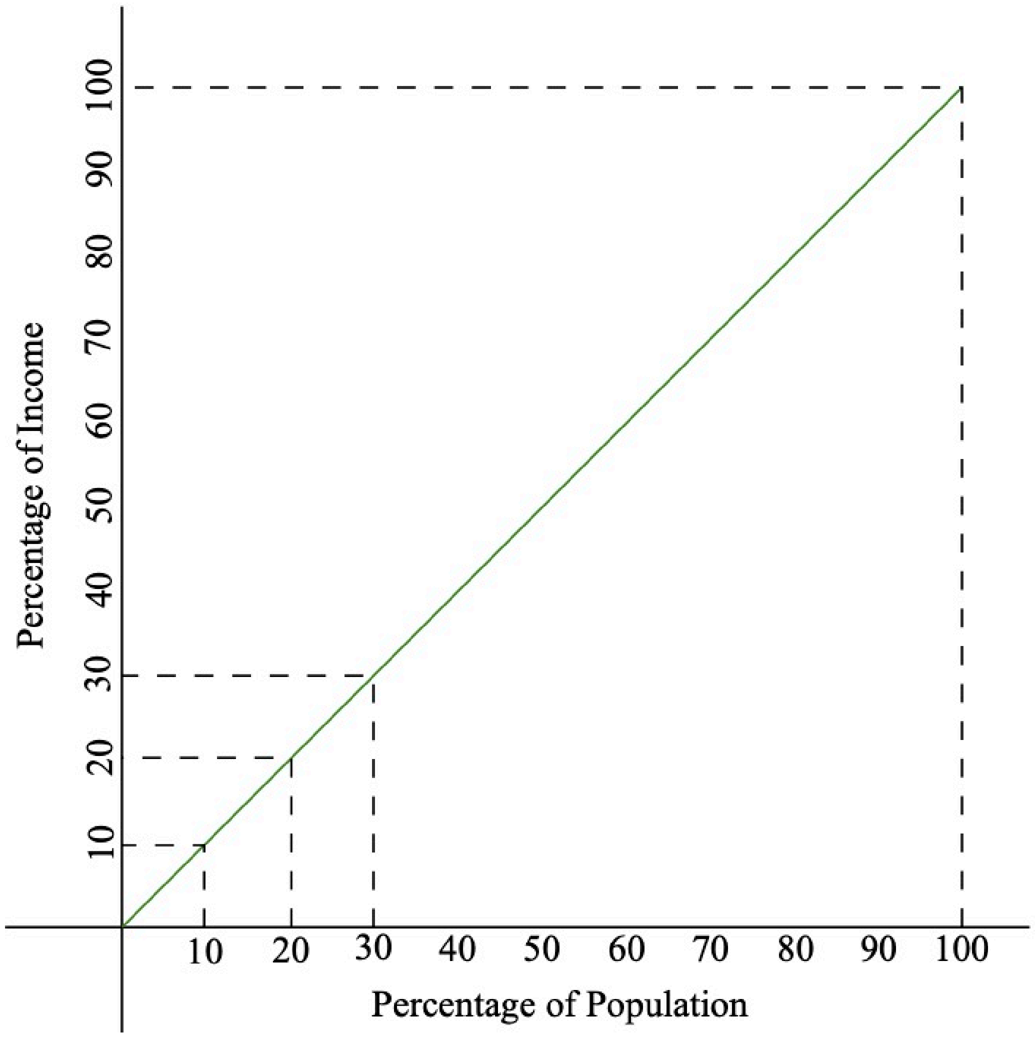


Lorenz Curves

Lorenz Curves are functions that show **what percentage of wealth the bottom x% control**

- **Perfect equality** is represented by a **45 degree line**
  - The Bottom 10% have 10% of the wealth
  - The Bottom 20% have 20% of the wealth
  - And so on
  - Everyone has the same amount of wealth

Lorenz Curves - Perfect Equality

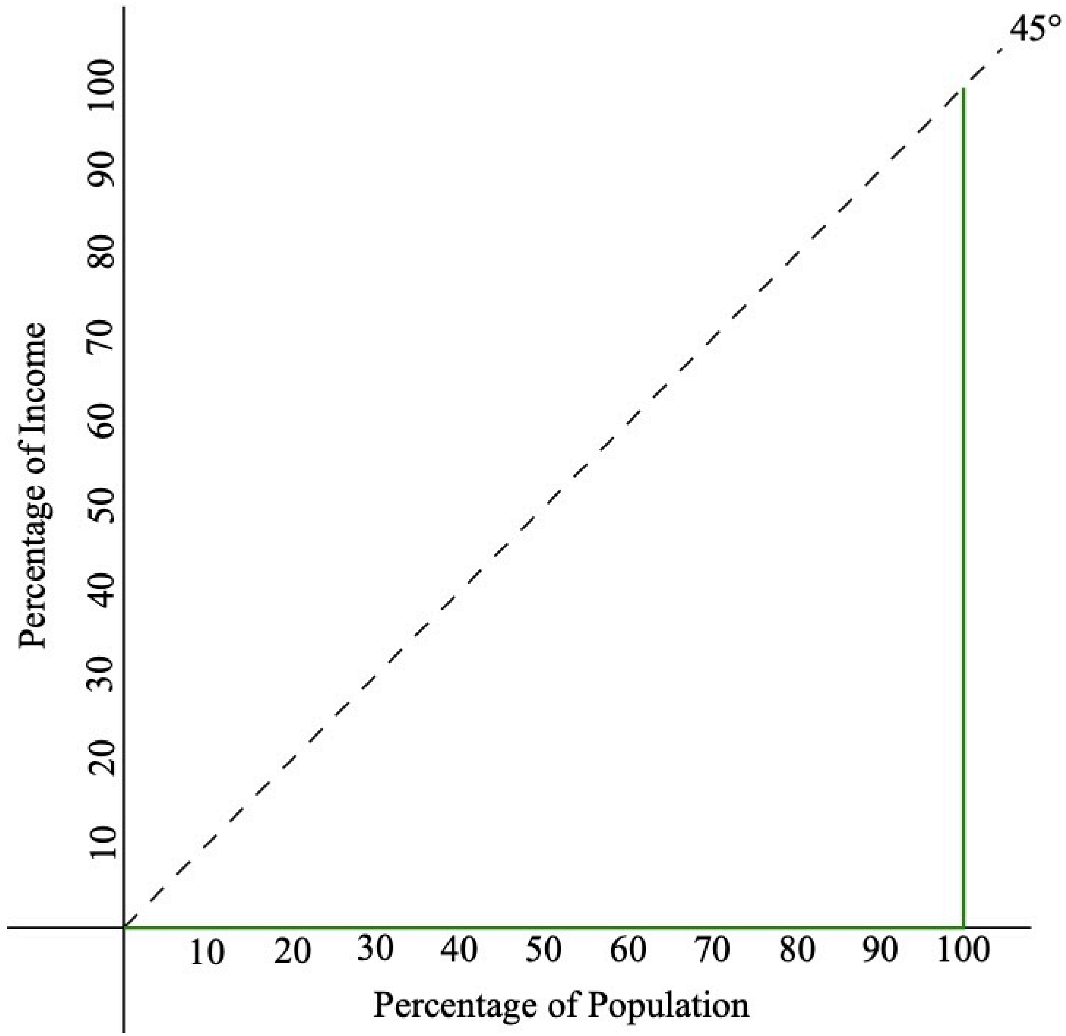


Lorenz Curves

On the other extreme, consider **perfect inequality**

- The Bottom 10% have 0% of the wealth
- The Bottom 20% have 0% of the wealth
- And so on
- Until we get to **the last person, who has all of the nation's wealth**

Lorenz Curves - Perfect Inequality

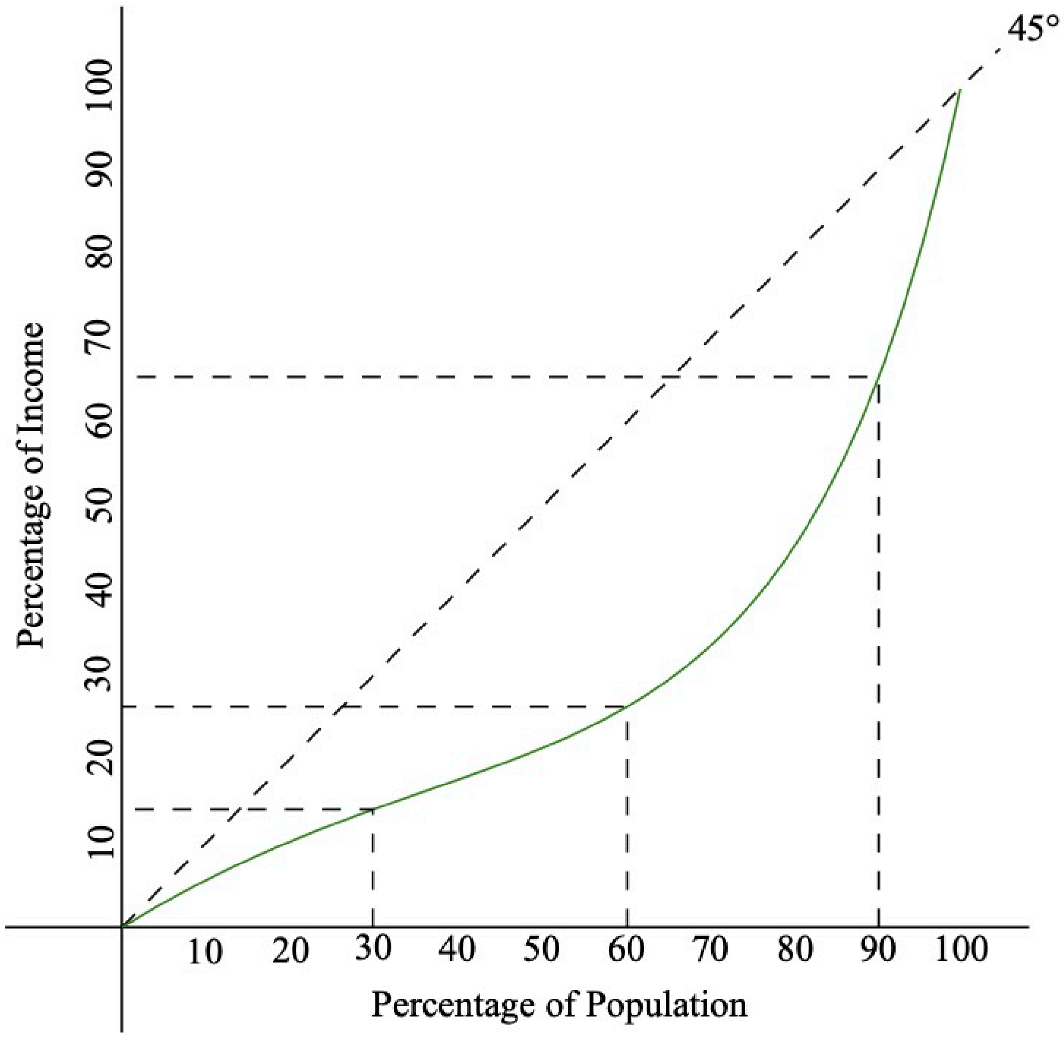


Lorenz Curves

In reality, **countries fall somewhere between the two extremes**

- The extent of inequality can be (somewhat) represented by the area between the **Lorenz Curve** and the **45 degree line**

Lorenz Curve - Realistic Example



Gini Coefficient

Graphs are a good visual representation of the wealth distribution

- **Quantifying** this would be very useful

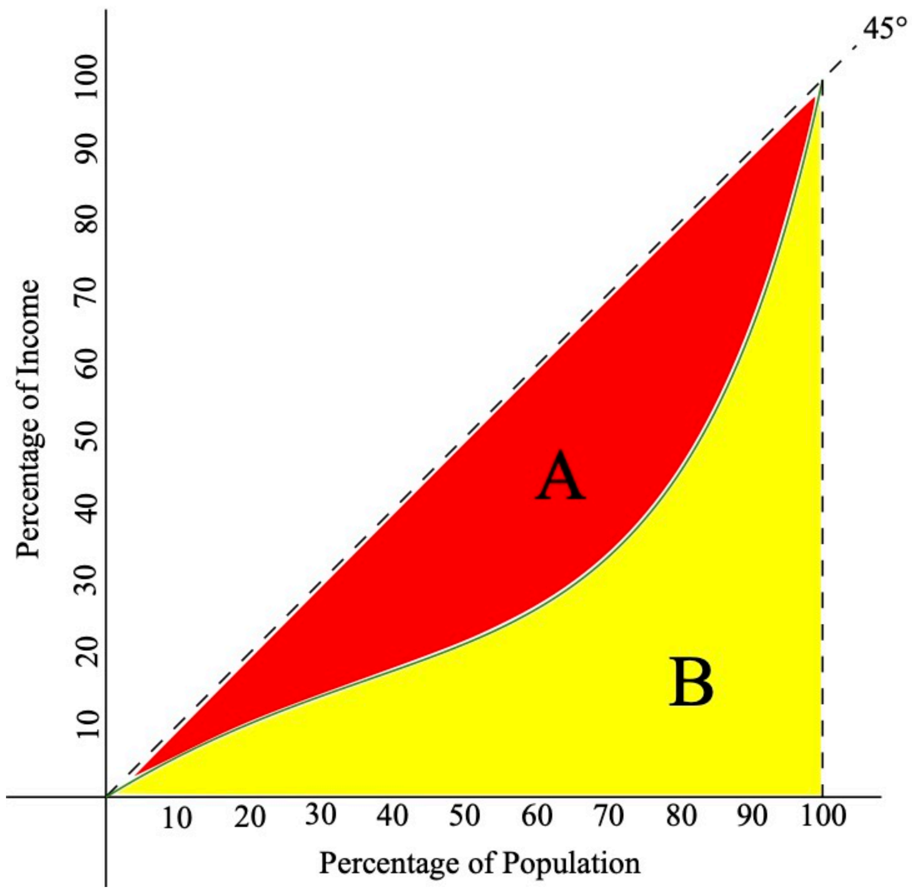
The **Gini Coefficient** measures how far away a country is from perfect equality

We define it as:

$$\text{GINI} = \frac{A}{A + B}$$

- The **Gini Coefficient** can range from 0 to 1
  - A **coefficient of 0** indicates **perfect equality**
  - A **coefficient of 1** indicates **perfect inequality**

Gini Coefficient Graph

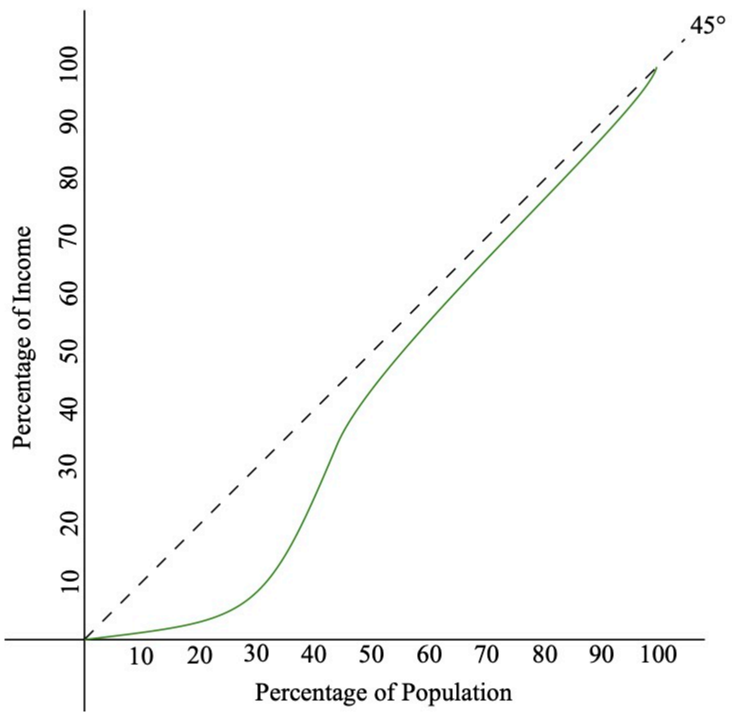


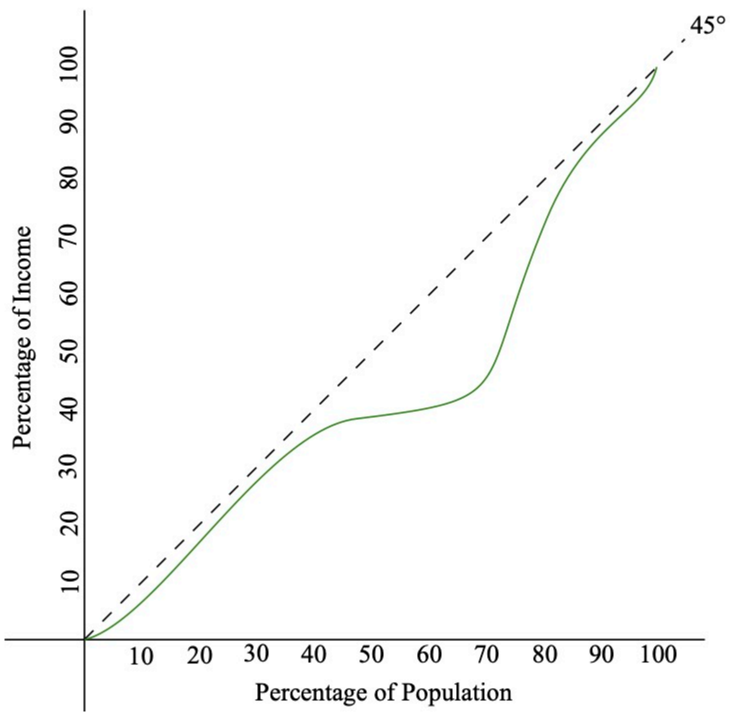
$$\text{GINI} = \frac{A}{A + B}$$

Gini Coefficient

It is a good metric, but does not provide all information about the distribution of wealth

Take for example these two diffferent countries:





Measuring Absolute Poverty

It is difficult to measure the (exact) Gini Coefficient → **we need to know incomes for everyone in a country**

- The data, isn't usually available for developing countries, so we need to use some coarser measure
- How can we get a **good idea of the intensity of poverty in a particular region?**
  - We can use the **Headcount Ratio Index**, which is the percentage of people living below the poverty line

Headcount Ratio Index

Say that the **absolute poverty line is $2**

- Country A has 3 Million out of 10 Million at or below this **poverty line**
  - The **Headcount Ratio is** $H = 3/10 = 30\%$
- But the **Headcount Ratio Index** tells us nothing about how the poor are distrubted beneath the **poverty line**
  - Everyone living at $1.50 per day is much different than everyone living at $0.10 per day

Total Poverty Gap

We can instead look at the **Total Poverty Gap (TPG)**

- This measures the total amount of money needed to get everyone up to the **absolute poverty line**

$$TPG = \sum_{i=1}^{H} (Y_p - Y_i)$$

- Where H is the total number of people below the poverty line
- Y_p is the poverty line (eg. $2 per day)
- Y_i is the income of the i^{th} person under the poverty line

Other Measures of Poverty Gaps

We can also have the **Average Porvery Gap**

$$APG = \frac{TPG}{\text{Country Population}}$$

- This measures the amount **each person** would need to be given to **everyone** them out of poverty

And **Average Income Shortfall**

$$AIS = \frac{TPG}{\text{\# of Poor}}$$

- Measures the average amount **poor people** are below the poverty line

Other Measures of Poverty Gaps

Normalized Income Shortfall

$$NIS = \frac{AIS}{\text{Poverty Line}}$$

- Measures the **Average Income Shortfall** as a **percentage of the poverty line**

Let's look at some examples

Poverty Measure Examples

Let’s return to our tiny country of **10 people**

- The **poverty line** is $1,000 per year
- There are three people **living at or below the poverty line**
  - Person A makes $500
  - Person B makes $800
  - Person C makes $950

Find all of **TPG, APG, AIS, NIS**

$$TPG = \sum_{i=1}^{H} (Y_p - Y_i) \quad ; \quad APG = \frac{TPG}{\text{Country Population}}$$

$$AIS = \frac{TPG}{\text{\# of Poor}} \quad ; \quad NIS = \frac{AIS}{\text{Poverty Line}}$$

Poverty Measure Examples

Total Poverty Gap

$$\begin{aligned} TPG &= (100 - 500) + (1000 - 800) + (1000 - 950) \\ &= 500 + 200 + 50 = 750 \end{aligned}$$

Average Poverty Gap

$$APG = \frac{TPG}{10} = \frac{750}{10} = 75$$

Average Income Shortfall

$$AIS = \frac{TPG}{\text{\# of Poor}} = \frac{750}{3} = 250$$

Normalized Income Shortfall

Why Does Inequality Matter?

Why Do Inequality and Poverty Matter?

We have explored the relationship between poverty/inequality

- It's clear that societies are worse off when more people are living in **absolute poverty**
- It is less clear exactly why **inequality is bad** for a country

Why Does Inequality Matter?

There are **three main proposals** for why **extreme** inequality is bad

1. **High inequality leads to Inefficiencies**
2. **High inequality leads to Unequal Distribution of Power**
3. **Ethically/Philosophically Unfair**

Why Extreme Inequality is Bad

1. **High inequality leads to Inefficiencies**

- Less people can qualify for a loan, and therefore are limited in their ability to invest in education, business, etc.
- Overall sayings rare is low because the poor usually do not save as much
- Inefficient allocation of assets
- Overemphasis on higher education instead of universal primary education
- Unequal distribution of farm land (most efficient is medium-size farm)

Why Extreme Inequality is Bad

2. High inequality leads to Unequal Distribution of Power

- Increased political power of the rich
- Policies sway in favor of the rich, at the expense of the poor
- Often leads to rent-seeking behavior, which reduces resources that could improve overall growth of the country
- Rich are less likely to improve institutions because they would not like to relinquish power
- Poor are more likely to support populist policies that can be self-defeating
- Often leads to higher crime
- With high inequality, the focus of politics often tends to be on supporting or resisting the redistribution of the existing economic pie rather than on policies that increase its size

Why Extreme Inequality is Bad

3. Ethically/Philosophically Unfair

- It is equally possible that you were born severely impoverished or exceptionally wealthy
- Given that people have no control over where they are born, it is only fair that people should have similar opportunities
- If these differences were based on difference in ability, work ethic, innovation, skills, etc, we might think differently
- Generally people would like less inequality rather than more, with the understanding that some inequality involves factors beyond our control
- Psychology studies have found many people have "inequality aversion": they tend to prefer more equal allocations

How Do We Fix It?

Poor Economics