Amartya Sen's Capability Approach

Capabilities are what a person is able to do or to be; functionings are those capabilities that are realized. Thus, functionings are 'beings' and 'doings'. Examples of the former (the 'beings') are being well-nourished, being undernourished, being housed in a pleasantly warm but not excessively hot house, being educated, being illiterate, being part of a supportive social network, being part of a criminal network, and being depressed. Examples of the 'doings' are travelling, working, taking part in social events, caring for a child, voting in an election, taking part in a public debate, taking drugs, killing animals, eating animals, donating money to charity, consuming lots of fuel to heat one's house.

Capabilities are a person's real freedoms or opportunities to achieve functionings. For example, while travelling is a functioning, the real opportunity to travel is the corresponding capability.

The distinction between functionings and capabilities is between the realized and the effectively possible, in other words, between achievements, on the one hand, and freedoms or opportunities, on the other.

Which of these two concepts relate more to the idea of means (means vs ends)?

According to the capability approach, 'functionings' and 'capabilities' are the best metric for most kinds of interpersonal evaluations. In other words, those interpersonal evaluations should be conceptualized in terms of people's functioning (their actual beings and doings) and their capabilities (the real opportunities they have to realise those functionings). These beings and doings together are held to constitute what makes a life valuable. Whereas 'functionings' are the proposed conceptualization for interpersonal comparisons of (achieved) well-being, 'capabilities' are the conceptualization for interpersonal comparisons of the freedom to pursue well-being, which Sen calls "well-being freedom" (Sen 1992: 40).

(https://plato.stanford.edu/entries/capability-approach/#FunCap)

Basic Mathematical Concepts for Economics

If you are interested in knowing more about mathematical economics, Simon and Blume's textbook, Mathematics for Economists, is a great starting point.

Economics uses a lot of math to derive results and explain difficult concepts. These notes are a basic overview of some of math and stats needed for this class.

Slope

Slope = change in y / change in x, or,
= change in one variable / change in the other variable

Usually, y variable is the dependent variable and x is the independent variables.
Independent variable is the one that changes independently, and dependent variable is the one that changes as a result. Dependent variable is plotted on the vertical axis, and the independent variable on the horizontal axis when plotting the relationship between variables.

Consider the following example. Price of a candy is $2. The shop makes money only from the sale of candies. What are the total revenues when the shop sells 4 candies? 5 candies? 10 candies? Calculate the slope of total revenue with respect to the number of candies sold when the sales increase from 4 to 5. When sales increases from 4 to 20. When sales increase from 6 to 20. What do you see? What kind of 'function' is the relationship between total revenues and quantity sold?

Probability distributions
Probability distributions assign a probability to each outcome. For example, what is the probability of heads occurring if I flip a coin multiple times? (Bernoulli distribution will tell you this). Probability distributions can be discrete (e.g. Bernoulli, binomial, Poisson) or continuous (e.g. normal, log normal, exponential). In economics we typically deal with continuous distributions, since most outcomes we look at are continuous (e.g. income or population).

In class, we looked briefly at the income distribution of a country. An income distribution tells us how a nation's GDP is distributed among the population. The following graph looks at incomes for Mexico in 2000 (this is a discrete distribution, because there are separate bins for each income).

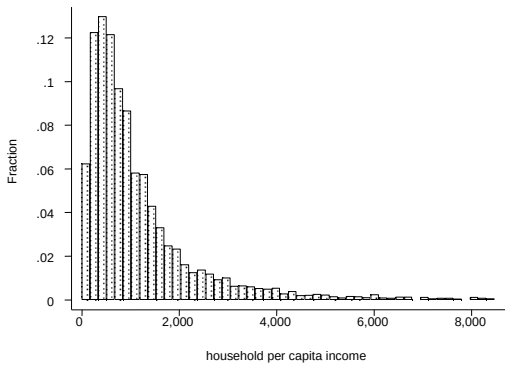
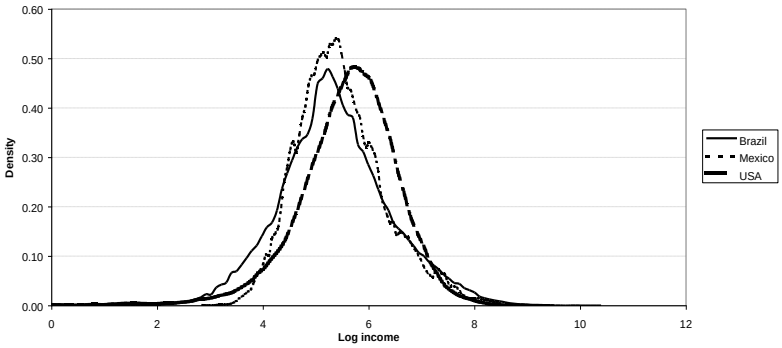


Figure 1.

Note that this graph is skewed to the right. Skewness refers to the direction that the **tail** is going in. So a right skew has a tail that extends to the right, left skew has a tail that goes to the left. Skewness is very common in many distributions involving economic variables.

What does this graph imply about the inequality in Mexico?

Figure 2: Income Distributions for Brazil, Mexico and The United States



Sources: PNAD/IBGE 1999, CPS/ADS 2000
Note: Gaussian Kernel Estimates (with optimal window width) of the density functions for the distributions of the logarithms of household per capita incomes. The distribution were scaled so as to have the brazilian mean. Brazil and Mexico are urban areas only. Incomes were converted to US dollar at PPP exchange rates (see Appendix).

Figure 2

This graph is a continuous distribution of income. Note that the x-axis is log income (rather than income, as in Figure 1).

Why did plotting the log income instead on income removed the skewness?
What is the shape of these curves usually called?
What can you say about the average income in the three countries based on Figure 2? About the distribution of income?

Probability distributions can be represented in two ways. Cumulative Distribution Functions (CDFs) give the probability that some number X takes on a value less than or equal to x, while Probability Distribution Functions (PDFs) gives the probability of x occurring.

(To find the PDF of a random variable, take the derivative of the CDF. To find the CDF, integrate the PDF. The CDF of a random variable x are usually written as F(x) while the PDF is written as f(x). <u>If this is confusing, don't worry too much. It's not important that you know the details, just that CDFs and PDFs exist and how they are related to each other.</u>)

If the data is discrete, we use the terminology: "probability mass function".

An example with discrete data:

Suppose we have a family with three children. The possible permutations of different genders of the children are:

{BBB,BBG,BGB,GBB,GGG,GGB,GBG,BGG}S={BBB,BBG,BGB,GBB,GGG,GGB,GBG,BGG}

where B = boy and G = girl. Suppose the probability of having a boy is the same as the probability of having a girl.

What is the probability mass function of the number of boys in the family?
What is the cumulative density function of the number of boys in the family?
What is the survival function of the number of boys in the family?