Elements of Macroeconomics Spring 2024

Week 1

1 Introduction

1.1 (Too) Brief History of Thought

To understand a social science it is always useful to know the environment in which the ideas and models emerged from. In macroeconomics economic crises changed the way we think and how we model the economy!

1. **Pre 1929: No distinction between Micro or Macro**
   - Strong belief in free markets/ the *invisible hand*
   - Western scholars tried to defend the market economy, while Eastern scholars tried to show the planned economy is better
   - Microeconomic choices of people and firms were easily aggregated to the macro level.
2. **1929: Great Depression**
   - Drop in output and employment too large to rationalize with a free market model
   - Keynesianism: Prices and Wages are sticky in the short-run. The government has to step in when a crisis occurs and fill the void of demand.
   - Micro and macro is different! We have *general equilibrium effects* (eg. If everyone wants to buy a house now, but the supply of houses is fixed, house prices increase)
3. **1970s: High Inflation and Oil Crises (1973, 1979/1980)**
   - Government spending does not alleviate, but worsens the problem!
   - Backlash: Markets are perfect, but government, unions,... are the sand in the wheel!
   - Models had no frictions, agents had perfect foresight, banks were not needed
4. **1990s-2008: Great Moderation**
   - No large crises: High economic growth and low inflation
   - The macro profession thought, they figured it all out
5. **2008: Great Financial Crisis**
   - Hugh crisis and former models could not help much
   - New-Keynesianism: prices and wages are sticky, heterogeneity and expectation matter
6. **2020: Covid and the come back of Inflation**
   - Focus on sectors and supply chain
   - Increase in inflation world wide

1.2 What is a model?

Reality is extremely complex. If we want to ask ourselves the effect of X on Y we need to simplify the situation. While natural sciences can create a controlled environment in the laboratory, economists have to use other tools. We develop models which contain only the essential parts for a specific question and abstracts from the rest. This helps us to think about a problem more clearly!

With this, we can

- explain a mechanism in a clear form. *How do tariffs affect trade?*
- quantify an effect. *How much did tariffs reduce trade?*
- show counterfactuals. *How large would trade be if tariffs did not exist?*
- make forecasts. *Given the expected tariff increase, how large will trade be in a year?*

Important: This means that 1. Every model is designed for a specific question and cannot be used for others automatically! 2. The results hinge on the underlying assumptions!

2 Working with Graphs: Background

Graphs help is to illustrate concepts and show how our models work. Therefore, we use them a lot in this class.

The linear function can be written as

$$f(x) = y = m * x + b \tag{1}$$

Where b is the intercept with the y-axis and m is the slope. We can calculate the slope by picking two points on the graph:

$$m = \frac{\text{change in value of the vertical axis}}{\text{change in value of the horizontal axis}} = \frac{\Delta y}{\Delta x} \tag{2}$$

In the case of demand and supply, the quantity (q) is a function of prices (p) or:

$$q(p) = m * p + b \tag{3}$$

You may wonder, why we put q on the x-axis and p on the y-axis. The answer is **convention!**

2.1 Drawing a graph from a table

Assume we have data from a company. Table 1 below shows the production costs (p) per unit (q).

Price per unit	Quantity
0	0
0.5	1
1	2
2.5	5
5	10

Table 1: Costs of Production

Exercise:

- Draw it as a 2-D Graph with prices on the y-axis and quantity on the x-axis.
- What is the slope of the curve?
- What is the functional form of the supply curve?

2.2 Drawing a graph from a formula

Sometimes you get a formula for a function directly and need to graph it.
Be careful: We often represent a formula as q(p), but graph it as p(q).

The demand curve is given by:

$$q(p) = -4p + 12$$

Exercise:

- Rewrite the demand curve as a function of $p(q)$
- Draw it in the same graph as before.
- Where do the two graphs intersect?

2.3 Calculating areas

We need to calculate rectangles and triangles.

- The area of a rectangle is $a * b$ where a and b are the length of the two sides of a rectangle.
- The area of a triangle is $(a * h)/2$ where a is the base and h is the height.

Exercise:

- What is the total cost of production at the market price? (intersection)
- What is the total area between the two graphs (from the y-axis to the market price)