

# Elements of Macroeconomics

February 2023

## 2 Working With Graphs

When analysing a model (such as demand and supply), we distinguish between:

1. Movements along the graph
2. Shift of the graph
3. Rotation of the graph

The linear function can be written as

$$y = m * x + b \quad (1)$$

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

$$q(p) = m * p + b \quad (2)$$

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

### 2.1 Movements along the graph

In this case, the graph does not move! The only thing which adjusts is that we **change**  $p$  and get a different  $q$ . For instance, a company changes it's price from 7.5\$ to 2.5\$, the demand increases from 5 to 15 (see figure 1).

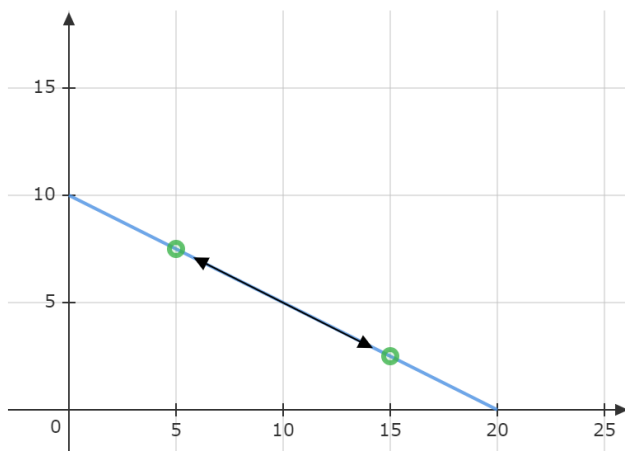


Figure 1: Movements along the graph

## 2.2 Shift of the graph

A graph shifts left or right if variables **outside** the market change! In this case, the **intercept**  $b$  changes. For instance, real income increased and we look at a normal good. The result is that the demand curve shifts to the right (see figure 2).

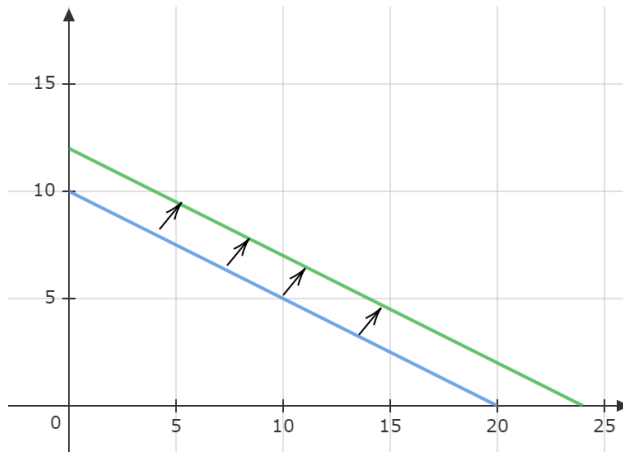


Figure 2: Shift of the graph

## 2.3 Rotation of the graph

Lastly, a graph can also rotate inwards or outwards. This means that the relationship between  $p$  and  $q$  changes. In economics, the **slope** ( $m$ ) of a graph depends on the **price elasticities**, eg how sensitive does the demand change if prices change. One example is that, a competing firm declared bankruptcy which reduces the substitutes on the market.

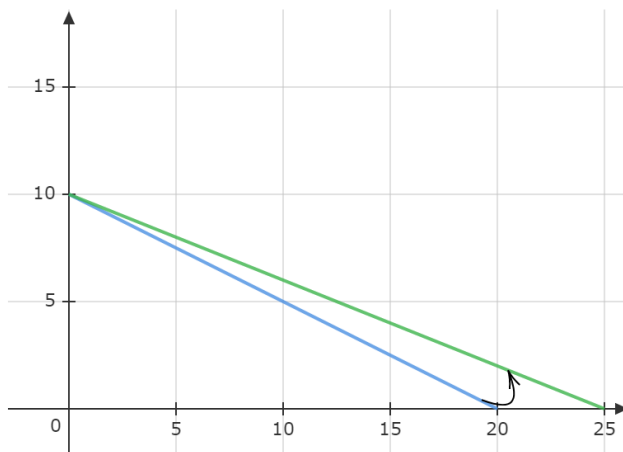


Figure 3: Rotation of the graph