

Day 1: Introduction

This course is meant to teach the basic concepts of **economics**, the study of how society allocates goods and services in a world of **scarcity**. We have a limited amount of resources in world and it's difficult to make choices within them. There are two fields we will be looking at in economics: **microeconomics** and **macroeconomics**. Microeconomics looks at consumer and firm behavior. Macroeconomics looks at the economy as the whole, like in terms of output (GDP).

Trade-offs Due to scarcity one has to make trade-offs:

- Trade-off: giving up one thing to get another
- Opportunity cost: the value of the next best alternative
 - Example: What is the opportunity cost of going to college?

Themes of Microeconomics

Three Questions

1. What goods and services are produced?
2. How should we produce them?
3. Who gets those goods and services?

Prices and Markets

- *Prices* will answer these questions. Why? Prices will determine if a good is produced or not by a firm and how much is demanded by the consumer. Firms with the right technology will produce depending on the price. Who? The people that can afford it.
- Markets are where prices are determined. Consumers and producers interact in the market for goods and services, and in the labor market.
 - Goods and Services – Consumers are households and individuals; producers are firms
 - Labor market – Consumers are firms and producers are households and individuals

Roles

- Consumers: maximize utility u s.t. income m .
- Producers: maximize profits π .
- Government ensures strong property rights, imposes taxes, imposes trade tariffs, imposes subsidies, etc.

Models Economists, both micro and macroeconomists, use models to understand how people make decisions. Models help us predict action, but it is important to note that they make a lot of simplifying assumptions. Economists test their models over and over using statistics to verify them.

Positive vs. Normative Question: So someone x wants to sell their kidney on eBay. Should they be able to do it? A positive statement of this is: x can sell her kidney on eBay. A normative statement of this: x should sell her kidney on eBay.

Model of Supply and Demand

In order to understand supply and demand, we can go about this in three methods: intuitively, graphically, and mathematically. I'll be going over the first two for today's lecture because deriving demand and supply curves is quite complicated. The basic idea is that supply and demand determine prices. In addition, we need a competitive market. What's a competitive market:

- Producers and consumers cannot directly influence the price
- All goods are the same, non-distinguishable
- Symmetric information
- No transaction costs
- Free entry and exit

Demand is the amount of a good or service that people are willing to buy at a specific price. The demand curve, generally obeys the "Law of Demand" and is downward sloping. That means as the price of a good goes down, more people want to buy it. Graphically, it is depicted as a downward sloping curve in the QP plane.

Why is demand downward sloping? Think of it intuitively. If prices are lower, you can buy more of a good. Since more is better, it is likely that a decrease in prices will make you want more of a good. Is this assumption realistic?

Supply is the amount of a good or service that firms are willing to sell at a specific price. When prices are high, firms want to supply more goods because profits are high. When prices are low, firms want to supply fewer goods because profits are low. Graphically it is depicted as an upward sloping curve in the QP plane.

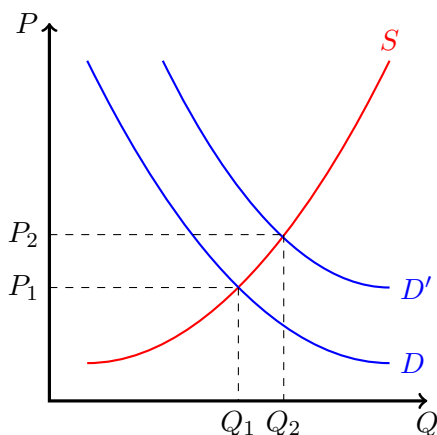
Why is supply upward sloping? First, it is not always downward sloping. However, when it is, it is because we say that producers make more profit at higher prices. More firms are willing to sell more with a higher price. Example: think of gasoline from the supply prospective.

Equilibrium is defined when supply equals demand. This determines the market clearing price P^* and quantity Q^* . At this point, consumers and producers have no incentive to deviate.

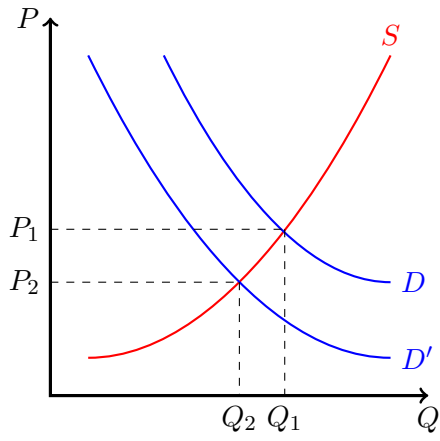
Demand and Supply Shocks: Worked Example

Consider the market for Justin Bieber's albums. Given the typical supply and demand curves, what can we say happens to P and Q :

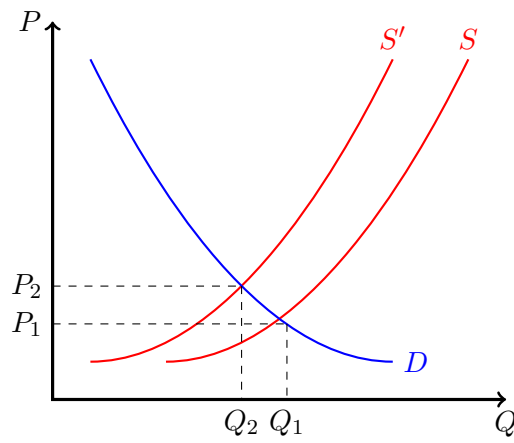
1. Justin Bieber's popularity sky rockets among older teenagers. ($P \uparrow$, $Q \uparrow$)



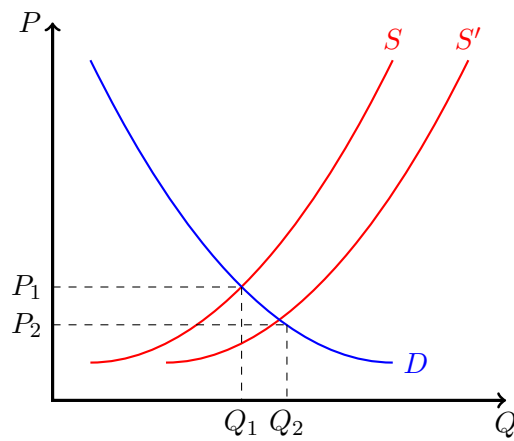
2. Justin Bieber is arrested for drunk driving. ($P \downarrow$, $Q \downarrow$)



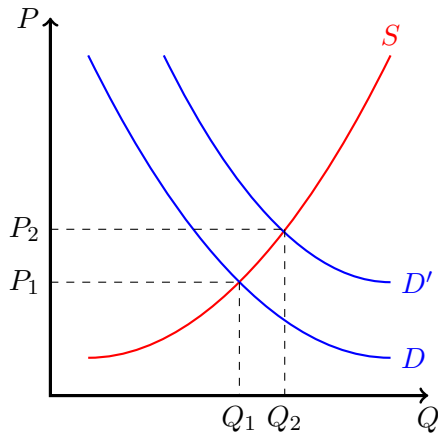
3. The people who help produce albums demand higher wages. ($P \uparrow, Q \downarrow$)



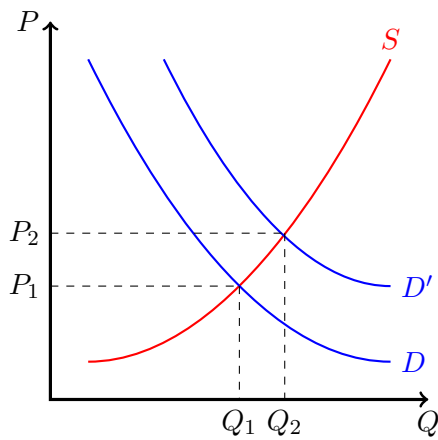
4. The cost of making music becomes less expensive. ($P \downarrow, Q \uparrow$)



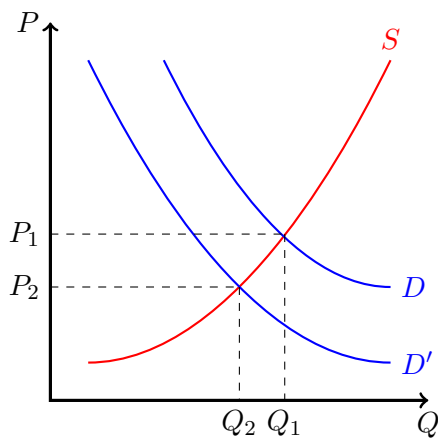
5. People become wealthier. ($P \uparrow, Q \uparrow$) Reason for this: income effect.



6. The price of Brittany Spears music rises. (Assume that they're substitutes) ($P \uparrow, Q \uparrow$)



7. The demand for Selena Gomez's music decreases. (Assume they're complements) ($P \downarrow, Q \downarrow$)



Intuitions: Consumer taste shifts demand (1,2). Labor and technology shift supply (3,4). As people become wealthier, demand increases (5). This is called the **income effect**. Substitutes move in the same direction. In other words, if the price of a substitute rises, demand for Bieber albums rises. *Complements react oppositely*. If two goods are complements, if the price of x_1 rises with respect to x_2 , $Q_{x_2}^D$ will decrease. Government is bad! When they put a price ceiling, no shift occurs. However, the price will drop and $Q_D > Q_S$. Both a price ceiling and taxes produce **deadweight loss**. For linear cases, the deadweight loss is the area of the triangle between the demand and supply curves. Online resource: <http://goo.gl/EcwQA>

Shock	Demand	Supply
Income	Shift	No shift
Price	No shift	No shift
Input Costs	No shift	Shift
Tastes/Expectations of consumers	Shift	No shift
Tastes/Expectations of producers	No shift	Shift
Price of substitute/complement changes	Shift	No shift

Government

In economics, government really has only so many things it can do to the market. In the supply and demand model, it will do one of four things:

- Tax
- Subsidize
- Price Floor/ Price Ceiling
- Tariff on trade

Example 1: Subsidized Loans for College

The United States provides thousands of subsidized loans to college students each year. We will analyze the effect of a government subsidy on college loans. Like taxes, we should consider whether or not this is a tax on the demand side or the supply side. For simplicity, let's assume that the subsidy is on the supply side. That is, for each loan, the government give a benefit to every loan that a bank makes.

$$Q_S = r \tag{1}$$

$$Q_D = 0.1 - r \tag{2}$$

$$r^* = 5\%, Q^* = 0.05 \text{ assume that this is in units of ten million people} \tag{3}$$

Now lets assume that the subsidy is $s = 0.04$. We rewrite equation (1) as:

$$Q'_S = r + s = r + 0.04$$

The idea is to say, with the new subsidy, the price to the producer must go up: $r_p = r^* + s$. Plug new supply Q'_s to solve for r^* . The new equilibrium is given by $Q^* = 0.07$, $r^* = 3\%$. We see that the price or interest rate has gone down and the quantity has increased due to the subsidy.

This is a subsidy on supply. A subsidy on demand should start with the analysis that $r_b = r - s$. Substitute $r - s$ into original demand and solve for r . Then, find r_b . Also of note is that a subsidy is simply the opposite of a tax. So a tax on supply makes the price to the seller $p_s = p - \tau$ and if on demand, it's $p_b = p + \tau$. Be aware the p is the same as r , as the interest rate is the price of a loan. These equations are on lump sum taxes independent of the price.

Example 2: Labor Market – The minimum wage

Notice that with a binding minimum wage above the market equilibrium, we have an over supply of labor but lack of demand, a surplus of supply, which is unemployment.

Price elasticity of demand

You will also notice that changes in quantities may be big or small given a shift in supply. The sensitivity of quantities with respect to changes in prices is known as the **price elasticity of demand**. It is really the percent in change in quantity with respect to a percent change in price. We say that inelastic demand means that changes in prices do not affect quantities very much (steep demand). For elastic demand, a small change in price leads to a large change in quantity (flat demand). Mathematically, we define the price elasticity of demand as:

$$\varepsilon = \frac{\Delta Q/Q}{\Delta P/P} = \frac{P}{Q} \frac{\Delta Q}{\Delta P}$$

Sometimes, we find the arc elasticity, which is the average of the elasticity of going from P_1 to P_2 and the elasticity of going from P_2 to P_1 .

What are some goods that are extremely inelastic? What are goods that are extremely elastic? Inelastic goods could be diabetic medication or textbooks. Elastic goods are like apples, soda, oranges. A good is inelastic if $-1 < \varepsilon < 0$ and elastic when $\varepsilon < -1$. A good is perfectly elastic if the elasticity is infinity. It is perfectly inelastic at zero.

Elasticity also will explain who bears the burden of taxes. Does the consumer lose out more or does the producer? Stay tuned for that in two more classes.

Quiz Question

If you have an a demand curve given by the equation $Q_D = a - bP$, where a and b are constants, what is the elasticity of demand when $Q = 0$? (a) 0, (b) $-\infty$, (c) b/a , (d) $-b/a$. Answer: By inspection, we see that the elasticity will be (b).

Total revenue test

If something is unit elastic, total revenue stays constant. If something is inelastic, total revenue is increasing in price. If something is elastic, total revenue is decreasing in price. We can look the following equation:

$$R = pq(p)$$

Take dR/dp to get:

$$\frac{dR}{dp} = q + pq'(p) = q + q\left(\frac{p}{q}q'(p)\right) = q(1 - |\varepsilon|)$$

Alternatively, we can use algebra to figure this out:

$$\begin{aligned} R &= pq \\ R' &= (p + \Delta p)(q + \Delta q) = pq + p\Delta q + q\Delta p + \Delta p\Delta q \\ R' - R &= p\Delta q + q\Delta p + \Delta p\Delta q \\ \Delta R &\approx p\Delta q + q\Delta p \\ \frac{\Delta R}{\Delta p} &= q + p\frac{\Delta q}{\Delta p} \\ \frac{\Delta R}{\Delta p} &= q\left(1 + pq^{-1}\frac{\Delta q}{\Delta p}\right) = q(1 - |\varepsilon|) \end{aligned}$$

Price elasticity of supply

Same equation, except denoted with the greek letter eta, η . Also, the elasticity of supply is *usually positive*. Like the elasticity of demand, we can think of elasticity as a measure of sensitivity. How sensitive is supply with respect to changes in quantity or price?

$$\eta = \frac{\Delta Q/Q}{\Delta P/P} = \frac{P}{Q} \frac{dQ}{dP}$$

Summary

- Economics is the study of the allocation of scarce goods.
- We try to answer three questions: what goods are produced? how should we produce them? Who gets them?
- People make trade-offs
- Market interactions between consumers and firms determine prices in a market.
- Economists use models with simplifying assumptions to derive important intuitions.
- The forces of supply and demand determine the market clearing price and quantity.
- Shocks to demand or supply with change the market clearing quantity and price.
- Government can be good or bad. However, unless in the case of a subsidy, it's usually bad.