Econ 200 AE Spring '25 Week 7

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Section Information / Reminders

Friday 11:30am, MOR 221.

Office Hours: Tue Thur 11am-12pm, SAV 403.

Weekly material posted on https://onirudh3.github.io/teaching.

Grading:

- Homework: 20% (lowest grade dropped), due every Thursday 11:59pm.
- Writing assignments: 20% (due May 1 and June 5).
- Midterm: 30% Tuesday, April 29.
- Final: 30% (non-cumulative) June 5.

Unit 8 Review

Some important things to recall (not exhaustive):

- In a monopoly, the firm is price setter. Profits maximized at MR = MC.
- In a competitive market, firms are price-takers. Firms choose quantity where P = MC.
- By definition, Price is the same as Average Revenue:

$$AR = \frac{TR}{Q} = \frac{P \times Q}{Q} = P$$

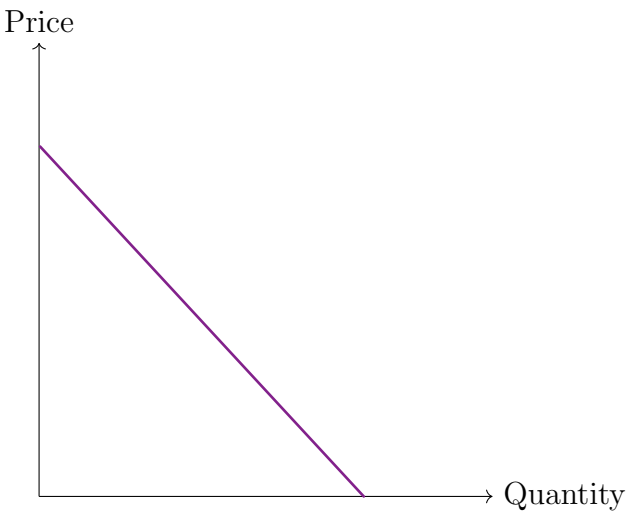
- If MR is constant, then MR = AR = Price.

- When firms are price-takers, market price is taken as given – the (individual firm's) demand curve will be horizontal.
- AR curve is the demand curve. MC curve is the supply curve.
- Law of Demand: When the price of a product decreases, the quantity demanded of the product will increase (downward sloping).
- Law of Supply: When the price of a product decreases, the quantity supplied of the product will decrease (upward sloping).
- Demand and supply curves, competitive equilibrium.
- Shift vs. movement along a curve.

Problems

Determinants of Demand & Supply.

1. Draw a demand curve for iPhones. What happens when:



(a) Apple raises the price of iPhones.

Quantity demanded falls — movement up to the left along the curve.

(b) Samsung raises the price of the Galaxy phones.

Increase in demand — rightward shift of curve.

(c) The cost of iPhone apps goes up.

Fall in demand — leftward shift of curve.

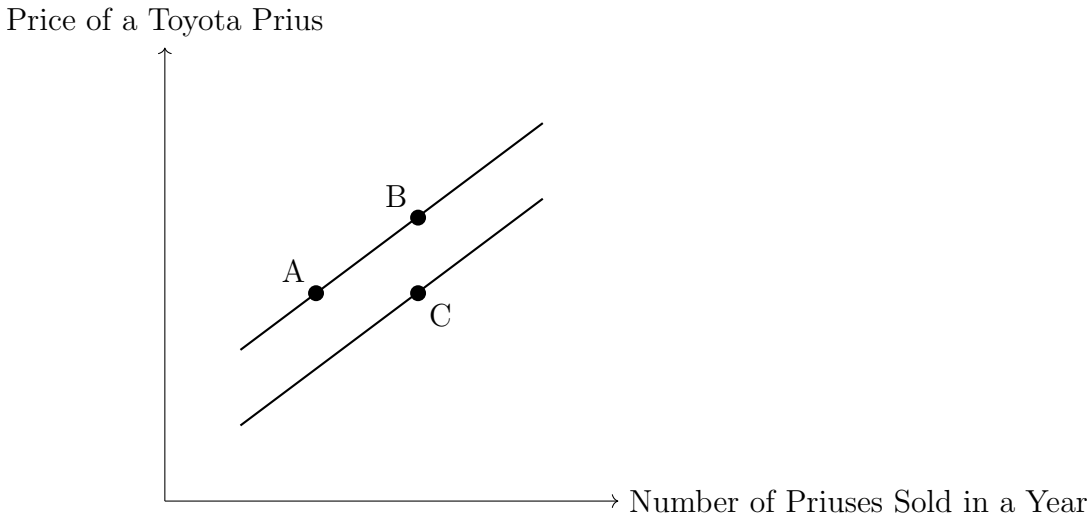
(d) New research shows that iPhones cause finger cancer.

Fall in demand — leftward shift of curve.

(e) A recession hits and incomes fall.

Fall in demand — leftward shift of curve.

2. Supply Curve.



(a) What are some factors that would move suppliers from point A to point B below?

Demand: Preferences, increase in price of a substitute good car, or income effects.

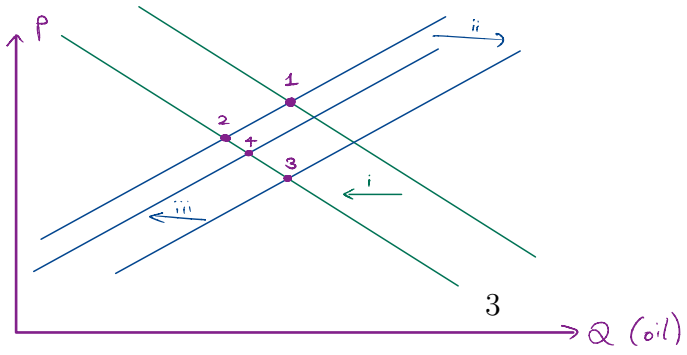
(b) What are some factors that would move suppliers from point A to point C? How about from C to B?

A to C: New technology, subsidy, reduced costs.
C to B: Natural disaster, increased costs.

3. Read the following statements about the oil market, show how the words correspond to shifts in the supply and demand curves and changes in the equilibrium.

"i. Until recently, world oil prices were quite high. Then, as alternative technologies and world-wide recession drove down the demand for oil, prices fell. ii. Saudi Arabia then relaxed its quantity controls and prices fell further. iii. As a result. investment in developing alternative oil sources, such as fracking, have fallen. Eventually we expect this to have what effect on equilibrium price and quantity oil? What will the final effect be on the market for Priuses?"

Potentially, we can get the following: path is 1, 2, 3, 4.



Prius is substitute for oil dependent vehicle.

Market Equilibrium and Curve Shifting

4. As a student representative, one of your roles is to organize a second-hand textbook market between the current and former first-year students. After a survey, you estimate the demand and supply curves to be $P^D = 20 - \frac{1}{2}$ Q & $P^S = 2 + \frac{1}{4}Q$.

(a) Find the equilibrium price and quantity.

$P^D = P^S \Rightarrow 20 - \frac{1}{2}Q = 2 + \frac{1}{4}Q$

$\Rightarrow Q^* = 24$

$\Rightarrow P^* = 8$

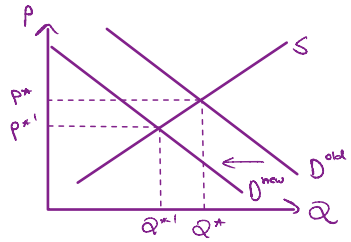
(b) Would there be excess demand or supply if you charged \$7 instead? What would it be?

Demand : $7 = 20 - \frac{1}{2}Q \Rightarrow Q^D = 26$

Supply : $7 = 2 + \frac{1}{4}Q \Rightarrow Q^S = 20$

} Yes, excess demand of 6.

(c) Someone posts on reddit that the professor is unlikely to use that textbook again next year. What would happen to the equilibrium price and quantity? (Which curve would shift and why?) Demand would shift left : less students willing to get it.

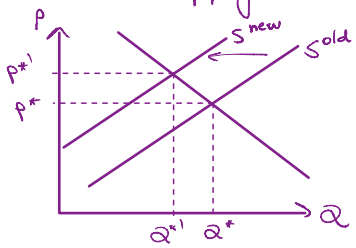


$P^{*\prime} < P^*$

$Q^{*\prime} < Q^*$

$\Rightarrow$ Both equilibrium price & quantity is going to fall.

(d) The roof leaks in the room where you are storing the books, destroying about half of them. What would happen to the equilibrium price and quantity? (Which curve would shift and why?) Supply curve : now you have less books to provide to the market.



$P^{*\prime} > P^*$

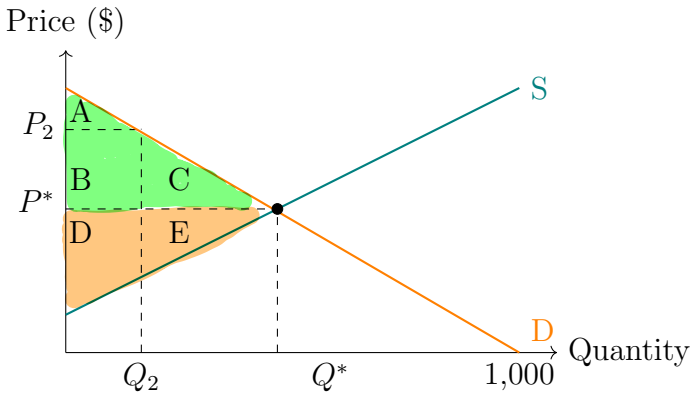
$Q^{*\prime} < Q^*$

$\Rightarrow$ Equilibrium quantity will fall, but equilibrium price will increase.

Surplus.

5. Use the areas labeled in the market represented in the figure below to answer the following

questions.



(a) What area(s) are consumer surplus at the market equilibrium price?

A + B + C

(b) What area(s) are producer surplus at the market equilibrium price?

D + E

(c) Compared to the equilibrium, what area(s) do consumers lose if price is P_2?

B, C

(d) Compared to the equilibrium, what area(s) do producers lose if the price is P_2?

E

(e) Compared to the equilibrium, what area(s) do producers gain if the price is P_2?

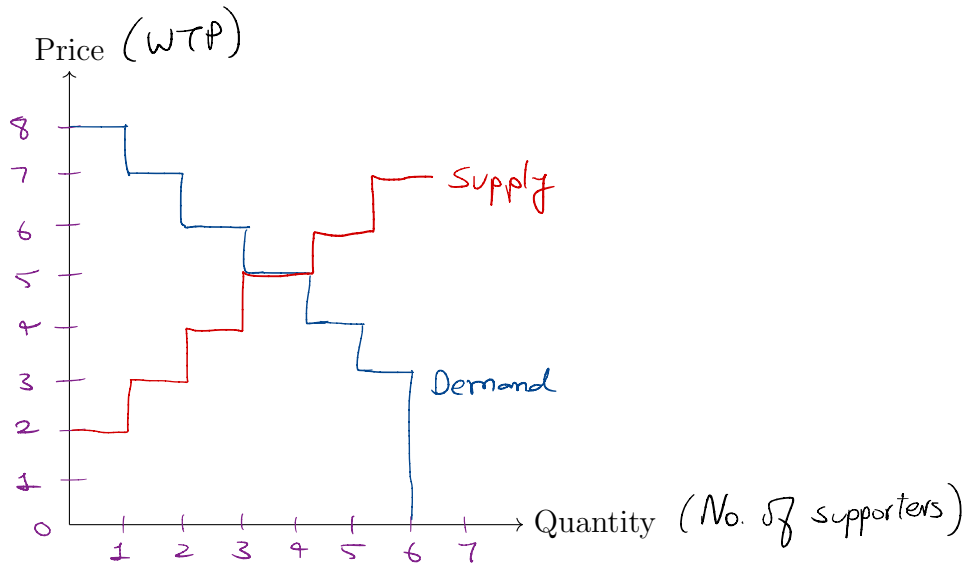
B

(f) Compared to the equilibrium, total surplus decreases by what area(s) if the price is P_2?

C, E

6. Exercise 8.3. [Maximizing the surplus]. Consider a market for the tickets to a football match. Six supporters of the Blue team would like to buy tickets; their valuations of a ticket (willingness to pay) are 8, 7, 6, 5, 4, and 3. The diagram below shows the demand 'curve'. Six supporters of the Red team already have tickets, for which their reservation prices (willingness to accept) are 2, 3, 4, 5, 6, and 7.

   (a) Draw the supply and demand 'curves' on a single diagram (Hint: the supply curve is also a step function, like the demand curve).



Suppose all trades are to take place at a single price as in a competitive market where buyers and sellers are price-takers.

(b) Show that four trades take place in equilibrium. Since there are four individuals with valuations of 5 and above, four trades will take place.

(c) What is the equilibrium price? Equilibrium price = 5 (where supply and demand intersect).

(d) Calculate the following by adding up the surpluses of each individual trade: consumer (buyer) surplus, producer (seller) surplus, total surplus in equilibrium.

Consumer surplus = 0 + 1 + 2 + 3 = 6.
Producer surplus = 0 + 1 + 2 + 3 = 6.
Total surplus = 6 + 6 = 12.

Now suppose that the market operates through bargaining between individual buyers and sellers.

(e) Find a way of matching the buyers and sellers so that more than four trades occur. (Hint: suppose the highest WTP buyer buys from the highest WTA seller.)

In this example, six trades take place:

Seller WTA (Red)	Buyer WTP (Blue)
2	3
3	4
4	5
5	6
6	7
7	8

(f) Using the scenario you found in Question 5, work out the surplus from each trade and compare it to the equilibrium surplus from Question (d).

Each of the trades gives a surplus of 1, so there will be a total surplus of 6 which is lower compared to the earlier total surplus of 12 we found.

(g) Starting from the allocation of tickets you obtained through bargaining, in which at least five tickets are owned by Blue supporters, is there a way through further trade to make one of the supporters better off without making anyone worse off?

Assume that the six trades take place. Now transfer the tickets of the two lowest value Blue supporters to the two highest value Red supporters at a price of 5 each.

So the lowest Blue supporter (with WTP of 3) is better off by 2 than he was before the trade (-3 + 5 = 2). Similarly, the second lowest Blue supporter is better off by 1.

Now see what's happened to the Red supporters. The second highest Red supporter is better off by 2 compared to before the trade took place. And the highest Red supporter is similarly better off by 1.

Note that these additional trades each give a surplus of 3, so the total surplus in the economy after both stages is back to 12, which was the Pareto optimal value we found in the equilibrium. So there are no further profitable transactions possible.