

FE341: Microeconomics
 Homework 1
 Due August 30th
ANSWER KEY

Please indicate the students that you worked on this homework assignment with, if any.

1. From the textbook page 18: Questions for Review #2

Which of the following two statements involves positive economic analysis and which normative? How do the two kinds of analysis differ?

- a. Gasoline rationing (allocating to each individual a maximum amount of gasoline that can be purchased each year) is poor social policy because it interferes with the workings of the competitive market system.

Positive economic analysis describes what is. Normative economics describes what ought to be. Statement (a) merges both types of analysis. First, statement (a) makes a positive statement that rationing interferes with the workings of the competitive market system. We know from economic analysis that a constraint placed on supply will change the market equilibrium. Second, statement (a) makes the normative statement that gasoline rationing is poor social policy. ”

- b. Gasoline rationing is a policy under which more people are made worse off than are made better off.

Statement (b) is positive because it states what the effect of gasoline rationing is without making a value judgment about the desirability of the rationing policy.

2. From the textbook page 18: Questions for Review #6

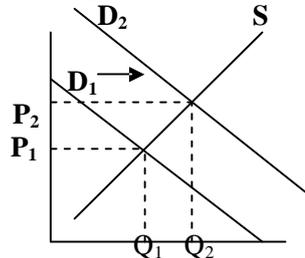
The price of long-distance telephone service fell from 40 cents per minute in 1996 to 22 cents per minute in 1999, a 45-percent (18 cents/40 cents) decrease. The CPI increased by 10 percent over this period. What happened to the real price of telephone service?

Let the CPI equal 1 for 1996 and the CPI for 1999 equal 1.1 (a 10% increase). To find the real price of telephone service in each period, divide the nominal price by the CPI for that year. For 1996, we have $40/1 = 40$ cents. For 1999, we have $22/1.1$ or 20 cents. The real price therefore fell from 40 cents to 20 cents, a 50% decline.

3. From the textbook page 57: Questions for Review #2

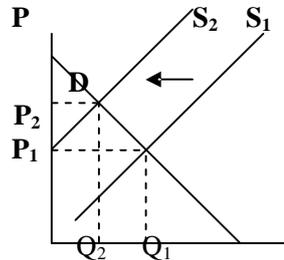
Use supply and demand curves to illustrate how each of the following events would affect the price of butter bought and sold: (a) an increase in the price of margarine;

Assuming butter and margarine are substitutes, this increases D which causes P and Q to increase. P



(b) an increase in the price of milk;

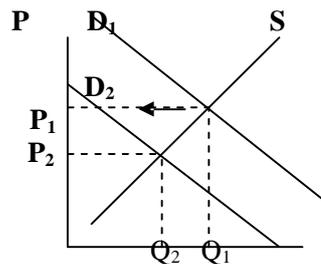
Assuming milk is the main ingredient in butter the cost of producing butter will increase, this decreases S which causes P to increase and Q to decrease.



NOTE: butter is actually made from the fat skimmed off the milk, so they are really complements in production. If you noted this relationship, then as the price of milk increases, so will the quantity of milk supplied, which will lead to more butter being produced (an increase in supply). This will cause S to increase, P to fall and Q to increase.

(c) a decrease in average income levels.

As average income levels fall, assuming butter is a normal good, this decreases D which causes P and Q to decrease.



4. From the textbook page 58: Questions for Review #7

Are the following statements true or false? Explain your answers.

a. The elasticity of demand is the same as the slope of the demand curve.

False Elasticity of demand is the percentage change in quantity demanded for a given percentage change in the price of the product. The slope of the demand curve is the change in price for a given change in quantity demanded, measured in units of output. Though similar in definition, the units for each measure are different.

b. The cross-price elasticity will always be positive.

False. The cross-price elasticity measures the percentage change in the quantity demanded of one product for a given percentage change in the price of another product. This elasticity will be positive for substitutes (an increase in the price of hot dogs is likely to cause an increase in the quantity demanded of hamburgers) and negative for complements (an increase in the price of hot dogs is likely to cause a decrease in the quantity demanded of hot dog buns)).

c. The supply of apartments is more inelastic in the short run than in the long run.

True. In the short run it is difficult to change the supply of apartments in response to a change in price. Increasing the supply requires constructing new apartment buildings, which can take a year or two more. Since apartments are a durable good, in the long

run a change in price will induce suppliers to create more apartments (if price increases) or delay constructions (if price decreases).

5. From the textbook page 59: Exercises #6

The rent control agency of New York City has found that aggregate demand is

$Q_D = 160 - 8P$. Quantity is measured in tens of thousands of apartments. Price, the average monthly rental rate, is measured in hundreds of dollars. The agency also noted that the increase in Q at lower P results from more three-person families coming into the city from Long Island and demanding apartments. The city's board of realtors acknowledges that this is a good demand estimate and has shown that supply is $Q_S = 70 + 7P$.

a. If both the agency and the board are right about demand and supply, what is the free-market price? What is the change in city population if the agency sets a maximum average monthly rent of \$300 and all those who cannot find an apartment leave the city?

To find the free equilibrium price, set supply equal to demand:

$Q_D = 160 - 8P = Q_S = 70 + 7P \Rightarrow P = \600 (price is in hundreds of dollars).

Substituting into either supply or demand $Q_D = 160 - 8 * 6 = 112$, we see that 1,120,000 apartments are rented. If the rent control sets the maximum rental rate at \$300, the quantity supplied of apartments is given by $Q_S = 70 + 7 * 3 = 910,000$, a decrease of 210,000 apartments from the free market equilibrium. At the rental rate of \$300, the quantity demanded of apartments is given by $Q_D = 160 - 8 * 3 = 1,360,000$.

The population will fall by 630,000 (the 210,000 fewer available apartments times the 3 people who occupy each apartment).

b. Suppose the agency bows to the wishes of the board and sets a rental of \$900 per month on all apartments to allow landlords a fair rate of return. If 50 percent of any long-run increases in apartment offerings comes from new construction, how many apartments are constructed?

At a rental rate of \$900, the supply of apartments would be $70 + 7 * 9 = 1,330,000$ units, which is an increase of 210,000 units over the free market equilibrium. Therefore, 50% of 210,000 = 105,000 units would be constructed. However, demand at \$900 is only 880,000 units ($160 - 8 * 9$), so 450,000 units will not be rented.

6. From the textbook page 59: Exercises #7

In 1998, Americans smoked 470 billion cigarettes, or 23.5 billion packs of cigarettes. The average retail price was \$2 per pack. Statistical studies have shown that the price elasticity of demand is -0.4, and the price elasticity of supply is 0.5. Using this information, derive linear demand and supply curves for the cigarette market.

Let the demand curve be of the general form $Q = a - bP$ and the supply curve be of the general form $Q = c + dP$, where a, b, c and d are the constants you have to find from the information given.

Recall: $E_P^D = \frac{P}{Q} \frac{DQ}{DP}$. You are given the E_P^D , and the P and the Q, which means you

can solve for the slope (b in the general equation). $-0.4 = \frac{2}{23.5} \frac{DQ}{DP} \Rightarrow \frac{DQ}{DP} = b = -4.7$.

To find the constant a, substitute for Q, P, and b into the formula $Q = a - bP = 23.5 = a - 4.7 * 2 \Rightarrow a = 32.9$. Therefore, the demand equation is given by:
 $Q_D = 32.9 - 4.7P$

Recall: $E_p^S = \frac{P}{Q} \frac{DQ}{DP}$. You are given the E_p^S , and the P and the Q, which means you can

solve for the slope (d in the general equation). $0.5 = \frac{2}{23.5} \frac{DQ}{DP} \Rightarrow \frac{DQ}{DP} = b = 5.875$. To

find the constant c, substitute for Q, P, and d into the formula $Q = c + dP = 23.5 = c + 5.875 * 2 \Rightarrow c = 11.75$. Therefore, the supply equation is given by:

$$Q_s = 11.75 + 5.875P$$