

1 PR: page3 18-19, Exercise #2

2. Consider the market for beer. What is the effect on the equilibrium price and quantity of the following events:

- a) the price of wine decreases.
- b) the price of barley and hops rises.
- c) consumers expect the price of beer to rise three months down the road.
- d) several major breweries open new plants across the US.
- e) it's discovered that a mixture of beer and eggs will stimulate hair growth on bald men and women.
- f) the government subsidizes the production beer because of generous PAC donations to the Republican controlled Congress.
- g) the personal incomes of people increase and a new, cheaper, brewery process is developed.
- h) the price of pizza rises and the wages of brewery workers rises.
- i) the government imposes a tax on the production of beer and the price of wine increases.

3. Distinguish between a change in demand and a movement along a given demand curve. Explain the chief causes of each. Now distinguish between a change in supply and a movement along a given supply curve. Explain the chief causes of each.

4. True or False: Explain

- a) If we know that more ice cream is being bought this year compared to last year, then we can conclude that there has been a change in demand and the price must be higher this year.
- b) If both the quantity consumed and the price of medical services have risen in the last fifteen years, then the demand curve for medical services must have shifted.
- c) In the cities, there are more medical services provided than there are in rural areas. Nevertheless, the price of medical services is higher in the cities. This indicates that our simple "supply and demand" story does not apply to markets for things like medical care.
- d) If the demand curve for garden weasels is very steep, then an excise tax on garden weasels would be almost entirely "passed on" to consumers.
- e) Washington County raises revenue through a tax on workers: everybody who has a job in Washington County must pay a tax of \$25 per year. It has been proposed that this tax be abolished and replaced by a tax on businesses equal to \$25 per employee per year. True or False: Although this change sounds like a good thing for workers, it might actually turn out to be bad for them, since it could cause wages to fall.

5. In a discussion of tuition rates, a university official argues that the demand for admission is completely price inelastic. As evidence she notes that while the university has doubled its tuition (in real terms) over the past 15 years, neither the number nor quality of students applying has decreased. Would you accept this argument? Explain. (Hint: The official makes an assertion about the demand for admission, but does she actually observe a demand curve? What else could be going on?)

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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 -0.40, and the price elasticity of supply is 0.50. Using this information, derive linear demand and supply curves for the cigarette market.

8. The rent control agency of New York City has found that the demand for rental housing is  $Q_d = 100 - 5P$ , with quantity measured in tens of thousands of apartments, and price, the average monthly rental rate, 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  $Q_s = 50 + 5P$ .

- a) If both the agency and 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 monthly rental rate of \$100, and all those who can't find an apartment leave the city?
- b) Suppose the agency bows to the wishes of the board and sets a rental rate 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?

9. In 1996, the US Congress raised the minimum wage from \$4.25 to \$5.15 per hour, and then raised it again in 2007. Some people suggested that a government subsidy could help employers finance the higher wage. This exercise examines the economics of a minimum wage and wage subsidies. Suppose the labor market for low-skilled labor is described by:

$$L^s = 10w \quad (\text{labor supply})$$

$$L^d = 80 - 10w \quad (\text{labor demand})$$

where  $L^s$  is the quantity of low-skilled labor (in millions of persons employed each year), and  $w$  is the wage rate (in dollars per hour), and  $L^d$  the quantity demanded of labor.

- What will the free market wage rate and employment level be? Suppose the government sets a minimum wage of \$5 per hour. How many people would then be employed?
- Suppose instead of a minimum wage, the government paid a subsidy of \$1 per hour for each employee. What will the total level of employment be now? What will the equilibrium wage rate be?

10. Elasticity questions:

- In August, 1990, East German taxicab drivers were on strike demanding lower cab fares. What must the drivers have believed about the price elasticity of demand for taxi rides?
- In 1977 Brazil was supplying about one-third of the world's coffee exports. When a frost wiped out about 75 percent of Brazil's 1976-77 crop, the price of green (unroasted) coffee rose 400 percent. What was the approximate price elasticity of demand for coffee? Why was it so low?
- "I earn \$20 a week and spend it all on beer no matter what the price of beer is." Exactly what is this person's elasticity of demand for beer?
- An athletic director at a college recently lowered ticket prices from \$12 to \$8 per game. Sales went up by 26 percent. The director said ". . . with the 33 percent decrease in ticket prices, dollar volume has increased about 16 percent." Is this claim consistent with what you know about demand elasticity? Find the elasticity of demand in this case, assuming the demand schedule is stable.
- According to recent studies at M.I.T. and the University of Michigan, a 10 percent increase in the price of cigarettes leads to a 14 percent drop in sales to teenagers. What is the elasticity of demand for cigarettes among teenagers? Would you expect it to be this high for older smokers? Explain your answers.
- In the mid-1980s, the state of Texas raised the price of personalized automobile license plates from \$35 to \$70. The state's revenue from the personalized license plates then fell. From this information, what can you say about the price elasticity of demand for personalized plates?
- Suppose the price elasticity of demand for rental housing is 0.60 and the average rent increases from \$275 per month to \$325 per month. At \$275 per month, 100,000 rental units are rented. What percentage decrease in quantity demanded would you predict from this information. Approximately how many units would be rented at \$325 per month?
- Assume first an effective government-imposed maximum price is placed on a particular good. The price is set below equilibrium. Let the price ceiling be removed. Consumer spending on the good will increase only if demand is inelastic. Evaluate.

11. Suppose the market for widgets can be described by the following equations:

$$P^d = 10 - Q \quad (\text{demand})$$

$$P^s = Q - 4 \quad (\text{supply})$$

where  $P$  is the price in dollars per unit, and  $Q$  is the quantity in thousands of units. Then:

- What is the free market price and quantity?
- Suppose the government imposes a tax of \$1 per unit to reduce widget consumption and raise government revenues. What will the new equilibrium quantity be? What price will the buyer pay? What amount per unit will the seller receive? What will government revenues be?
- Suppose the government has a change of heart about the importance of widgets to the happiness of the American public. The tax is removed, and a subsidy of \$1 per unit is granted to widget producers. What will the equilibrium quantity be? What price will the buyer pay? What amount per unit (including the subsidy) will the seller receive? What will be the total cost to the government?

12. Consider the market for widgets, a market generally agreed to be perfectly competitive. To help balance the national budget, Rep. Horace Scalpum (R-ND) proposes a bill that would set a tax of \$1/widget on the sale of widgets.

- Supposing that the suppliers would pay the tax directly, show the effect on price and quantity.
- One million widgets are currently being produced and sold domestically each year. (Ignore imports and exports.) Horace's researcher, Reynard Fox, wishes you to testify that the proposed tax will raise \$1 million per annum. What can you say?

13. Consider the market for beer as described by the following equations:

$$P^d = 60 - 2Q \quad (\text{demand})$$

$$P^s = 10 + 3Q \quad (\text{supply})$$

where  $Q$  is measured in millions of barrels per year and  $P$  is the price in dollars per barrel.

a) Free Market Calculations:

- i) What is the equilibrium price and quantity of beer?
- ii) Calculate the point elasticity of demand at this equilibrium. Is demand price elastic or inelastic?
- iii) Calculate consumer and producer surplus at the equilibrium price. Illustrate graphically.

b) Government Intervention I:

- i) What would be the effect on the price and quantity of beer if the government imposes a tax of \$4 per barrel on suppliers?
- ii) How much revenue does the government collect?
- iii) Recalculate consumer and producer surplus. What is the deadweight loss? Social gain?

c) Government Intervention II:

- i) Suppose a price ceiling of \$20 is imposed. Calculate the new quantity demanded and supplied.
- ii) Calculate the "full" price that consumers ultimately end up paying.
- iii) Recalculate consumer and producer surplus. What is the deadweight loss? Social gain?

d) Government Intervention III:

- i) Suppose a price floor of \$50 is imposed. Calculate the new quantity demanded and supplied.
- ii) How much beer must the government purchase to keep the price at \$50? How much will this program cost taxpayers?
- iii) Recalculate consumer and producer surplus. What is the deadweight loss? Social gain?

14. A person argues that if the prison sentences for all crimes were doubled, this would worsen the problem of overcrowded prisons, all other things being equal. Use the concept of demand to explain why this argument is likely to be incorrect.

15. In 1992, the French government was subsidizing sales of French wheat farmers. American farmers argued that this created unfair competition. The American president took a tough negotiating stance on behalf of American farmers and convinced the French to cancel the subsidy. Assume that American producers' supply curve crosses American consumers' demand curve at \$12 a bushel, that without the subsidy French farmers will sell any quantity of wheat to Americans at \$10 a bushel, and that the subsidy leads French farmers to supply any quantity of wheat to Americans at \$8 a bushel. Use a graph to illustrate the gains and losses to Americans as a result of the president's success. Did the president increase or decrease the welfare of Americans, and by how much?

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18. In 1993, the Mississippi River flooded, causing widespread devastation and leaving midwesterners desperate to acquire basic necessities such as food and ice (for food storage). Profiteers soon emerged, selling ice for as much as \$50 per pound. Editorialists and politicians decried this price gouging and called for an end to it.

- a) Suppose that the authorities had effectively prohibited price gouging. What would have been the effect on the amount of ice brought into the affected area?
- b) Suppose that the authorities had effectively prohibited price gouging and somehow managed to ensure that their action had no effect on the quantity of ice in the area. What would have been the effect on social welfare?
- c) Suppose that a pure altruist in the affected area had come into possession of a small amount of ice. Explain why she might have charged \$50 a pound for it, even if she was completely unconcerned with her own welfare.

19. About 100 million pounds of jelly beans are consumed in the United States each year, and the price has been about 50 cents per pound. However, jelly bean producers feel that their incomes are too low, and they have convinced the government that price supports are in order. The government will therefore buy up as many jelly beans as necessary to keep the price at \$1 per pound. However, government economists are worried about the impact of this program, because they have no estimates of the elasticities of jelly bean demand or supply.

a) Could this program cost the government more than \$50 million per year? Under what conditions? Could it cost less than \$50 million per year? Under what conditions? Illustrate with a diagram.

b) Could this program cost consumers (in terms of lost CS) more than \$50 million per year? Under what conditions? Could it cost consumers less than \$50 million per year? Under what conditions? Again, use a diagram to illustrate.

20. Suppose that it is now between harvests, so that the number of avocados is in fixed supply. There are equal numbers of avocados available in Los Angeles and San Francisco, but the demand curve is much higher in LA.

a) Compare the prices and quantities of avocados in the two locations.

b) In view of your answer to part (a), what will avocado suppliers begin to do? If it is costless to ship avocados, when will this process stop? Why?

c) Draw the demand and supply curves for avocados in the two cities both before and after the process you described in part (b). Compare consumers' and producers' surpluses before and after the process takes place.

d) Suppose that it were made illegal to transport avocados from one city to another. Could this benefit consumers? Producers? Society as a whole? What areas would you have to measure to get definitive answers to these questions?