

Problem Set 4: Simple Competitive Markets

The Basics

1. The market demand for lemons is $Q_d = 100 - 4P$. The market supply is $Q_s = 4P - 20$.
 - a. Draw the **demand curve** and **supply curve** on the same diagram.
 - b. What is the **equilibrium** price and quantity of lemons?
 - c. What is the total **consumer surplus** at this price?
 - d. What is the total **producer surplus**?
 - e. What would be the cost to consumers in \$ of a government ban on selling lemons? What would be the cost to producers? What would be the total **social cost** in \$?
 - f. Suppose that the government to support Florida farmers mandates a minimum lemon price of \$20. What is the new **consumer surplus** and **producer surplus**. What happens to **total surplus**?
 - g. Show on a diagram the area that corresponds to the loss of **total surplus** in (f).

Taxes in Competitive Markets

2. In search of a way to fund his promised income tax reduction, and in the interests of family values, Presidential candidate Mitt Romney proposes a "revenue enhancement" measure: a "fee" of \$0.90 per gallon of gas. His opponent, President Obama, senses this proposal may have offended a large body of SUV owners. He would instead impose the fee only on the fat cat oil refiners.
 - a. Suppose demand for gas is given by $Q_d = 1,250 - 125P$, and supply is given by $Q_s = 1,000P - 1,000$, where P is in \$. What is the pre-tax **equilibrium** price and quantity?
 - b. If the fee of \$0.90 is imposed on the consumers what is the new **demand curve**? What is the new equilibrium price and quantity? What is the amount of **tax revenue**?
 - c. If the fee of \$0.90 is imposed on the producers what is the new **supply curve**? What is the new equilibrium price and quantity? What is the amount of **tax revenue**?
 - d. How much of the tax is paid by the consumer under each proposal?
 - e. What is the loss of **total surplus** (in \$) from each tax?

f. Kurt Vile, fresh from an Econ 1 class, suggests that Romney should instead tax insulin, since the demand curve for insulin is inelastic at $Q_d = 900$. What is his rationale? What is the net social saving from Kurt's proposal in \$?

3. Suppose the city of Davis imposes a luxury tax on latte producers of \$1 per latte. Assume the latte market is perfectly competitive. Suppose also demand for latte's (per hour) is given by $Q_d = 20 - 2P$, and supply is given by $P = 2$, where P is in \$.

(a) What is the before tax price and quantity sold (per hour)?

(b) What is the new price and quantity sold after the tax? How much of the tax is paid by the producers? What is the **deadweight loss** (per hour) from the tax?

(c) The **excess burden** of a tax is the social cost (in \$) of raising each dollar of tax revenue. It is thus the deadweight loss divided by the tax revenue. What is the excess burden of the \$1 latte tax?

(d) Draw a graph of tax revenue (on the vertical axis) versus the size of the tax (on the horizontal axis), showing where it intersects the axis. In the 1980s this diagram was known as the **Laffer Curve**. Notice that it implies that at some levels of taxation revenue will increase when tax rates are reduced.

Price Floors

4. Suppose that in San Francisco the demand for taxi rides per hour is given by $Q_d = 120 - 5P$, while the supply is given by $Q_s = -30 + 10P$. The market is competitive.

(a) Draw the supply curve and demand curve.

(b) What is the equilibrium price of a taxi ride, and the quantity of rides per hour?

(c) In an effort to raise drivers' incomes the city mandates a \$12 minimum fare. What is the new quantity of rides?

(d) Explain why there is a rent seeking loss and the form the rent seeking loss will take.

(e) Show the area of **deadweight loss** from this policy on your diagram and calculate the amount per hour.

(f) Show the area of **rent seeking** loss and calculate the amount.

(g) Explain what happens to the drivers' **producer surplus** as a result of the fare rise. Is the average driver better off or worse off after the fare increase?

(h) Suppose instead the Mayor limits the number of taxi licenses, so that there are only enough taxis to supply 60 rides per hour. Calculate the **deadweight loss** from this, the **rent seeking loss**, and the gains or losses in drivers' **producer surplus**. Is the quota on licenses more or less effective as a way of raising drivers' income than the price floor?

(i) Suppose taxi licenses are not tradable. They have to be used by the person they were assigned to. In the long run (say 20-30 years from now) what is the **deadweight loss** from this, the **rent seeking loss**, and the gains or losses in drivers' **producer surplus**.

(j) Suppose instead taxi licenses are tradable. They can be sold by the person they were originally issued to. Explain what happens in the long run now.

Price Ceilings

5. "Arugula" is a popular restaurant because the food is good and the owners, Benjamin and Sally, charge prices just high enough to cover the car payments on their Volvo. As a result there is always a long line for tables, especially on weekend nights, where the wait is typically an hour. Suppose demand for meals at Arugula is given by $Q_d = 100 - P$, where P is the price in \$. Suppose also the supply is fixed at $Q_s = 80$. Benjamin and Sally, however, charge only \$10 for the meal.

a. Draw a diagram of the market for meals at Arugula. What is the price at which the demand equals the supply? What is excess demand at $P = \$10$?

b. What, in \$s, is the **social cost** of Benjamin and Sally's good intentions? What creates this social cost?

c. Observing the long lines of people waiting, and wishing to spare them the discomfort, Benjamin and Sally build a special waiting area with seats where they serve free wine and whole grain snacks. Explain using a diagram what the effect is of their further good intentions on the social cost of their pricing policy.

d. Kurt Vile, a rabid free marketeer and military paraphernalia enthusiast, is incensed by Benjamin and Sally's refusal to charge a higher price. He therefore takes to hanging outside Arugula on a Saturday night with a large whip flailing at the Birkenstock crowd to the snarling accompaniment of his pet Rottweiler "Maggie T." This diminishes the waiting time at Arugula to 5 minutes. Benjamin and Sally reluctantly prosecute Kurt for his activities. Kurt argues in court that his activities had no **social cost**. Is he correct?

e. Reluctantly Benjamin and Sally raise prices to the level at which demand equals supply to get rid of Kurt. Is anyone harmed by this decision? Explain.

f. Troubled by the profits they are now making Benjamin and Sally celebrate the Christmas season by announcing that 9 am on December 24, 2000 they will give \$100 to each of the first 100 people who ask for the money at their house. Kurt is enraged and pickets the distribution with "Maggie T" and his Boy Scout Troop. Why? Would any distribution scheme satisfy Kurt?

6. In Berkeley there is a rent control ordinance. Suppose that the market demand for apartments is given by $Q_d = 2000 - P$, where P is the monthly rent in \$. Market supply is fixed at $Q_s = 1400$ apartments in the short-run. Rents are fixed at \$400.

- a. Will there be any **deadweight** losses from the rent controls? Explain.
- b. Will there be any **rent seeking** losses? If so, how much? Explain.

7. In both NYC and in India there are long lines for most government services - getting a driver's license, getting a building permit, and so on.

- a. Why is waiting costly to society and what is the standard solution to the problem?
- b. Why is that solution not implemented?
- c. There is now a class of people who earn their living in both New York and India by waiting in line for those who can afford to pay them. Why does the existence of these professional "waiters" create stronger arguments for the market solution to the problem?

8. The University of California still charges well below the market price for a college degree in California. For example in 2011-12 the University of the Pacific in Stockton charged \$36,390 for tuition and fees. Out of state students at Davis paid \$38,001. In comparison UC Davis charged in-state students \$15,123 in tuition and fees. Explain why this should create a **rent seeking** loss, and explain in what forms that loss will appear.

9. The University of California, Davis sells houses in Aggie Village, close to downtown Davis, to randomly chosen faculty and staff who have not purchased a home in the private market for about half their market value. The houses have to be sold back to the university at the purchase price increased by the cost of living index. Explain why this policy implies **rent seeking** losses.