BPUB 250 Joel Waldfogel
Managerial Economics Spring 2002

PROBLEM SET 6 - **Due Wednesday, Apr. 17th**

1. You have been indicted, and your case has been assigned to Judge "Maximum Jane" Jones. There is an eighty percent chance that the jury will find you guilty, in which case Maximum Jane will impose a $10,000 fine on you (and no prison term). You face a 20 percent probability of being found innocent. If you go to trial, the trial itself will be costless to you. You have $100,000 in wealth, and your utility function is $U(W)=\sqrt{W}$. You are deciding whether to plead guilty (and negotiate a fine) or go to trial.

    a. What is the maximum fine you will pay in a plea bargain to avoid the trial?
    b. Suppose your case is assigned to Judge "Minimum Joe" Smith. With Minimum Joe you still face an 80 percent chance of being found guilty, but if you are found guilty, your fine is only $5,000. What is the maximum fine you will now pay in a plea bargain to avoid a trial?

2. An individual faces a wage of $5 per hour. She has 40 hours available to allocate between work and leisure. She has no non-labor income.
    a. Show her utility-maximizing labor choice in a diagram with leisure on the horizontal axis and all other goods on the vertical axis.
    b. Suppose the government imposes a 20% income tax. Show income and substitution effects on the leisure axis.
    c. Starting again from the $5 wage, suppose the government grants everyone $50, then imposes a 40% tax on all income including the grant. Show the old and new budget constraints in a new diagram. Label all relevant points.
    d. Describe the effect of this tax and transfer program on hours of work. Illustrate your answer with a diagram. Assume that leisure is a normal good. Is there more than on possibility?

3. Consider a competitive industry producing a useful product as well as a negative externality.
    a. Is the industry production level more or less than the socially optimal level? How about the industry price?
    b. How could an emissions fee remedy the negative externality in production? Illustrate.
    c. Suppose that the externality is positive rather than negative. Is industry output (in part a) less or more than the socially optimal amount? How about price?

4. Air pollution in Los Angeles is controlled by point-source rules: Each plant must meet certain emissions requirements. An alternative is to periodically issue firms coupons giving the "right to pollute" at a certain level for a certain period of time. If the total number of coupons issued to the firms were such that the pollution level equals the pollution level with point-source standards, which method offers greater economic efficiency? Demonstrate using diagrams.

5. Where will lemonade stands locate along a 100-yard boardwalk? Assume that customers are uniformly distributed along the adjacent beach and that the market can support only 2 vendors.
    a. If beach visitors go only to their nearest vendor, where will the vendors locate? How do you know?
    b. Suppose beach visitors are willing to walk no more than 25 yards for lemonade. How does your answer change?
    c. Make the link between game theory and this question.
    d. Suggest some phenomena that this model describes?

6. Fish production depends on the number of boats operating, according to the following function: $F=100*B^{0.9}$ per period. The price of fish is $1 per unit. Operating a boat costs $75 per period.
    a. There is no control of fishing. Describe the free entry equilibrium in the fishery, mathematically and with a diagram.
    b. What, if anything, is wrong with the outcome in (a)?
    c. Propose a solution, and explain how it works, using both math and diagrams.

7. What kind of goods are Hollywood movies? Given the type of good they are, how well do you expect markets to allocate them? What are the private problems? What are the social problems? Use diagrams. What strategies has Hollywood developed to address these problems?