EEP101/ECON125 Spring 00
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Problem Set 1: due Tuesday, February 15, 2000, in class

(Late assignments will not be graded.)

Part A: Numerical Problems

1. We have a market where the market (inverse) demand function is given by $p = 400 - Q$, where p is the price in dollars and Q is the total quantity demanded. The marginal cost of production (mc) is given by $mc = 40 + 2Q$ and the marginal external cost (mec) is given by $mec = 10 + 0.5Q$.

   a) Determine the socially optimal level of output (Q*), and the total external cost (TEC*), consumer surplus (CS*) and producer surplus (PS*) at this level of output. What is total welfare W*?

   b) Determine the equilibrium price a monopolist is likely to charge (p_m) and the equilibrium output that results (Q_m).

   c) Determine the consumer surplus (CS_m), the producer surplus (PS_m), and the total external cost (TEC_m) under monopoly. What is the deadweight loss (DWL_m) in this case?

   d) The government wants to fix the externality problem using a price mechanism. What is the optimal level of this tax/subsidy? (Which one is it?) Explain and draw a graph to illustrate your answer.

   e) Assume the government imposes the tax or subsidy you found in part (d). How does the government's finances change? What is the change in the consumer surplus? What is the change in the producer surplus? What is the change in the total external cost? What has happened to the DWL found in part (c)? Explain.

   f) Do parts b) to e) again, this time assuming that perfect competition prevails in this market instead. (That is, obtain p_c, Q_c, CS_c, PS_c, TEC_c, and so on …)

2. Assume there are two groups of people, swimmers and power-boat enthusiasts, who live around the same lake. The marginal benefit of boating is $MB = 200 - e$, where e is the number of boat-hours per week, and MB is defined in US$ (this is net of all marginal costs of operating the boat). The combination of damages (noise, gas run-offs and aesthetic offenses) imposed on the very annoyed swimmers by the boaters is estimated to represent a marginal external cost of $MEC = 50 + 0.20e$. (Disregard for now the difficulty we would encounter in actually obtaining this number.)

   a) What is the optimal level of boat-hours from the boater's point of view? From the swimming group? What should the optimal level of boat-hours per week, e*, be according to the principles we have seen in this class? What do **you** think? Explain.

b) What is the dead-weight loss in each case?

c) If property rights were defined in such a way as to give the boating group the right to do as they please, what are the maximum possible gains from trade by moving to the optimal level of boat-hours e*?

d) If property rights were defined in such a way as to give the swimming group the right to a clean and quiet lake, what are the maximum possible gains from trade by moving to e*?

e) What would prevent the two groups from moving up to e* in the real world? Explain.

Part B: Essay question

Write a brief (less than one page) essay on topic described below. Remember that your answer must be in the form of an essay. (Don't just answer the questions. Discuss the issue!)

1. On January 1, 1998, the State of California introduced a ban on smoking in public bars because of health risks to employees and non-smoking patrons. Examine this issue using the economic tools and concepts (surplus, deadweight loss, tax revenue, …) you have seen to date. Your discussion should address the following matters:

   a) What is the primary market failure leading to government intervention? In your experience, is the ban uniformly enforced?

   b) Do you feel that there exists a market resolution to this issue?

   c) Can smokers be said to be rational agents? What are they maximizing?

   d) What group's ownership of property rights is consistent with the smoking ban?

   e) What are some (current or proposed) alternative policies? What are the pros and cons of the different options?

Part C: Bonus question

1. If you had to leave tomorrow for a deserted island and stay there for a year, and you were allowed only a single book (fiction or non-fiction), which one would you take with you? Why?