

Section I: Definitions

1. Common factor: For any correlation between two variables, A and B, there are three possible explanations, one or more of which could result in the correlation: 1) A causes B; 2) B causes A; 3) Some third factor causes both. This third factor is called the "common factor" in empirical economics.
2. Moral hazard: Adverse actions taken by individuals or producers in response to insurance against adverse outcomes.
3. Consumption smoothing: In a model of insurance, this refers to the equalization of consumption across all "states" (good and bad).
4. OASDI: The Old Age, Survivors and Disability Insurance program, in reference to its three components.
5. Prospective Reimbursement: The practice of paying providers based on what treating patients should cost, not on what the provider spends.

Section II: True/False (Please note: No credit will be deducted if you do not give extra explanation to those "true" statement)

6. False. The Coase Theorem gives a private-sector solution to externality. It says in the presence of externalities, the government should primarily establish property rights to prevent market failure. However, the subsidy is a public-sector solution which the government can apply on private firms to directly correct externalities.
7. True. International emissions trading will lower the costs of pollution reductions substantially, which makes trading countries better off.
8. False. Television signals are excludable but non-rival.
9. False. This behavior is best characterized as moral hazard.
10. False. The move to an efficient allocation could make some agents worse off. For example, it is usually Pareto Efficient to allocate all resources to one consumer. If we move from an inefficient allocation in which everyone has a positive quantity of consumption goods and then move to the

efficient allocation where only one person gets all the consumption goods, then we have not made everyone better off.

11. True. In this case, firm A is called “having market power” such that it can affect market prices through its actions and prevent other firms from entering its market.

12. True. Because the “bad” state is predictable, the individuals can prepare for these events through self-insurance (saving); and, because these cost of bad “states” are small (short run unemployment), savings or borrowing will be sufficient for smoothing consumption. Therefore, self insurance will be most feasible in this situation.

13. True. The major motivation for government-provided social insurance is the failure in private insurance markets caused by adverse selection. Adverse selection causes insurance markets to fail because imperfect information leads to insurers to be unable to offer full insurance to different types of consumers.

14. False. There was a sharp reduction in elderly poverty during the 1960s and 1970s when the social security as a share of GDP significantly increased.

15. False. Under the current law, social security will be able to pay about 75% of promised benefits once the trust fund is exhausted (full credit for any number from 60% to 80%) .

Section III: Problems to Solve

16. Here, we need to add the demands vertically. Solving for both inverse demand curves, we get:

$$P_{\text{Bob}} = 40 - Q$$

$$P_{\text{scott}} = 15 - 0.5Q$$

Adding those where prices are both positive, we find that the segment of the social marginal benefit curve is given by:

$$P = 55 - 1.5Q, \text{ when } 0 \leq Q \leq 30$$

Note Scott is no longer willing to pay anything when Q exceeds 30, so there the social marginal benefit curve is:

$$P = 40 - Q, \text{ when } 30 \leq Q \leq 40$$

See the attached sheet for the graph.

17. Find the quantity at which the social marginal benefit is equal to social marginal cost, which is \$35. So:

$$35 = 55 - 1.5Q$$

$$Q = 40/3$$

18. The trick here is to recognize which segment of the social marginal benefit curve is intersected by the marginal cost curve. If we set $55 - 1.5Q = 5$, we'd find that $Q = 33.33$, but that segment was only defined where $Q \leq 30$. So, we set the marginal cost of 5 equal to $40 - Q$ and find that $Q = 35$.

19. This problem is similar to problem 2 in PS 2. Rewrite the marginal cost of reduction for firm A as:

$$Q_A = \frac{MC_A - 50}{30}$$

Rewrite the marginal cost of reduction for firm B as:

$$Q_B = \frac{MC_B - 20}{60}$$

The total marginal cost of reduction MC_T is the horizontal sum of MC_A and MC_B :

$$Q = Q_A + Q_B = \frac{3MC_T - 120}{60}$$

Rewrite this as:

$$MC_T = \frac{60Q + 120}{3}$$

To get the social optimal total level of pollution reduction, we equate MC_T with MB :

$$\frac{60Q + 120}{3} = 500 - 3Q$$

Solve it,

$$Q^{so} = 20$$

Therefore,

$$MC_T^{so} = P^{so} = 500 - 3Q^{so} = 440$$

The social optimal level of firm A's pollution reduction is:

$$Q_A^{so} = \frac{P^{so} - 50}{30} = 13$$

The social optimal level of firm B's pollution reduction is:

$$Q_B^{so} = \frac{P^{so} - 20}{60} = 7$$

See the attached sheet for graphs.

20. If the two plants have to split the amount of reduction, $Q_A = Q_B = 10$.

Thus, $MC_A = 50 + 30Q_A = 350 < MC_B = 20 + 60Q_B = 620$.

When trading of pollution permits is allowed, firm B will sell its pollution permits at a price between 350\$/unit and 620\$/unit to firm A. And firm A is willing to accept this offer. Both of them will be better off due to cost saving in pollution reduction.

Section IV: Short Answer Questions

21. For Unemployment Insurance:

(a) The major motivation for government-provided unemployment insurance is that adverse

selection causes private markets to underprovide this kind of insurance. People with private information about their employment status are more likely to purchase this insurance.

(b) A typical moral hazard for unemployment insurance is: if workers have unemployment insurance, they may be less likely to search hard for a new job.

For Disability Insurance

(a) The major motivation for government-provided unemployment insurance is that adverse selection causes private markets to underprovide this kind of insurance. People with private information about their future health status are more likely to purchase this insurance.

(b) A typical moral hazard for disability insurance is: the benefit levels of this program will potentially increase the incidence of disability and reduce the level of work effort.

For Workers' Compensation

(a) The major motivation for government-provided unemployment insurance is that adverse selection causes private markets to underprovide this kind of insurance. People with private information about the danger of their jobs are more likely to purchase this insurance.

(b) A typical moral hazard for workers' compensation program is: increase in the benefit levels will lead to a large rise in the rate of reported injury.

22. This question is from problem 1 in PS 3.

Any two ways of the followings:

(a) Females have higher SSW than males because both pay the same taxes, but females live longer than males and so receive benefits for a longer time.

(b) Someone born in 1925 would have the higher SSW because of the tax-rate growth effect and wage and growth population effects got smaller starting in the 1970s.

(c) A married person has the higher SSW because spouses of workers are automatically entitled to 50% of the workers' benefits, and surviving widows receive 100% of the workers' benefits. So married worker purchases not just his own benefits, but those for his wife as well.

(d) A low-wage worker has higher SSW because of how Social Security redistributes income.

(e) Single-earner couples have more SSW because even though only one person works, that couple gets 150% of the earner's benefit. The two-earner couple has to pay taxes on their full earnings even though they may not receive more benefits than the one-earner couple.

23. Any of

(a) Regulation seems to offer greater certainty of the outcome than taxes.

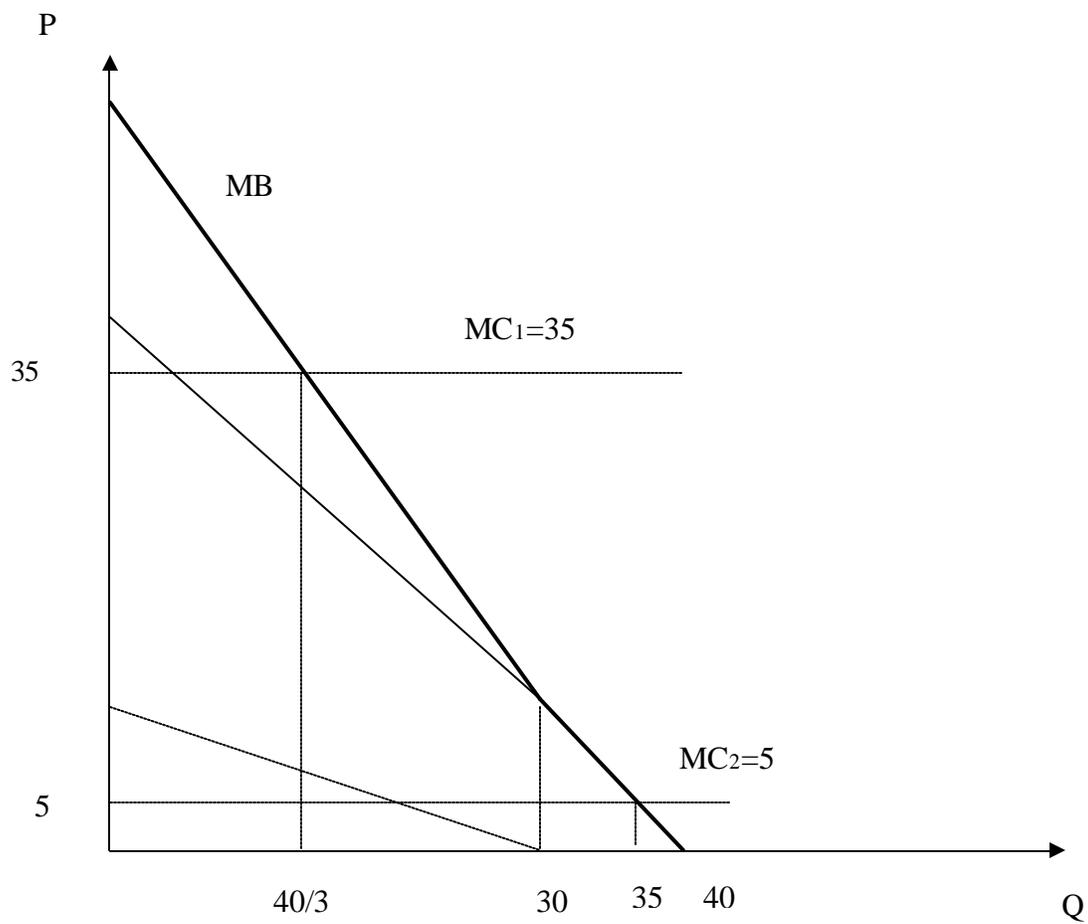
(b) With regulation, the benefits are obvious and the costs are relatively invisible. With taxes, the benefits are relatively invisible and the costs are obvious.

(c) Some policy makers distrust or misunderstand the market. They do not want firms to view taxes as the price of polluting (even though raising the price should reduce the quantity), they want to command them to pollute less.

24. One reason it is difficult for winners to compensate losers is the inability of government to make commitments. Government cannot really promise to make payments or other compensation since those payments will become political targets. Another reason is political uncertainty. The benchmark for compensation the losers have in mind may include expected gains after the next election. Those paying the compensation may not agree on the probability of political change.

25. They construct a staircase buyers' offer curve by drawing, at a height corresponding to each bid price, a horizontal line with length corresponding to the associated bid quantity. The buyers offer curve is constructed by joining these lines end to end, starting with the highest bid price and then down to the lowest. Assuming this order is filled, each buyer actually pays the price he submits.

16.



19 and 20.

