

ECON 103, 2008-2
ANSWERS TO HOME WORK ASSIGNMENTS

In preparation for the final examination

Chapter 15

WRITE [1] Based on the following three individual demand schedules for a particular good, and assuming these three people are the only ones in the society, determine (a) the market demand schedule on the assumption that the good is a private good, and (b) the collective demand schedule on the assumption that the good is a public good. Explain the differences, if any, in your schedules.

Individual #1		Individual #2		Individual #3	
Price	Q_d	Price	Q_d	Price	Q_d
\$8	0	\$8	1	\$8	0
7	0	7	2	7	0
6	0	6	3	6	1
5	1	5	4	5	2
4	2	4	5	4	3
3	3	3	6	3	4
2	4	2	7	2	5
1	5	1	8	1	6

Ans:

DEMAND SCHEDULES

PRIVATE GOOD		PUBLIC GOOD	
Price	Quantity Demanded	Price	Quantity Demanded
\$8	1	\$19	1
\$7	2	\$16	2
\$6	4	\$13	3
\$5	7	\$10	4
\$4	10	\$7	5
\$3	13	\$4	6
\$2	16	\$2	7
\$1	19	\$1	8

The first schedule (private good) represents a horizontal summation of the individual demand curves; the second schedule (public good) represents a vertical summation of these curves. The market demand curve for the private good will determine—in combination with market supply—an actual price–quantity outcome in the marketplace. Because potential buyers of public goods do not reveal their individual preferences in the market, the collective demand curve for the public good is hypothetical or needs to be determined through “willingness to pay” studies.

WRITE [2]

Use your demand schedule for a public good determined in question 1 and the following supply schedule to ascertain the optimal quantity of this public good. Why is this the optimal quantity?

P	Q _s
\$19	10
16	8
13	6
10	4
7	2
4	1

Ans:

Optimal quantity = 4. It is optimal because at 4 units the collective willingness to pay for the final unit of the good (= \$10) matches the marginal cost of production (= \$10).

WRITE [3]

The following table shows the total costs and total benefits in billions for four different antipollution programs of increasing scope. Which program should be undertaken? Why?

Program	Total Cost	Total Benefit
A	\$ 3	\$ 7
B	7	12
C	12	16
D	18	19

Ans:

Program B, since the marginal benefit no longer exceeds marginal cost for programs which are larger in scope. Plan B is where net benefits—the excess of total benefits over total costs—are maximized.

WRITE [12]

Place an M beside the items in the following list that describe a moral hazard problem; place an A beside those which describe an adverse selection problem.

- A person with a terminal illness buys several life insurance policies through the mail.
- A person drives carelessly because he or she has automobile insurance.
- A person who intends to “torch” his warehouse takes out a large fire insurance policy.
- A professional athlete who has a guaranteed contract fails to stay in shape during the off-season.
- A woman anticipating having a large family takes a job with a firm that offers exceptional child care benefits.

Ans:

Moral hazard problem: (b) and (d). Adverse selection problem: (a), (c), and (e).

CONSIDER [4]

Why are spillover costs and spillover benefits also called negative and positive “externalities”? Show graphically how a tax can correct for a negative externality and how a subsidy to producers can correct for a positive externality. How does a subsidy to consumers differ from a subsidy to producers in correcting for a positive externality?

ANS: Spillover costs are called negative externalities because they are external to the participants in the transaction and reduce the utility of affected third parties (thus “negative”). Spillover benefits are called positive externalities because they are external to the participants in the transaction and increase the utility of affected third parties (thus “positive”).

See Figures 15-3 and 15-4.

Compare (b) and (c) in Figure 15-4.

CONSIDER [7]

Explain the following statement, using the MB curve in Figure 15-6 to illustrate: "The optimal amount of pollution abatement for some substances, say, water from storm drains, is very low; the optimal amount of abatement for other substances, say, cyanide poison, is close to 100 percent."

ANS: Reducing water flow from storm drains has a low marginal benefit, meaning the MB curve would be located far to the left of where it is in the text diagram. It will intersect the MC curve at a low amount of pollution abatement, indicating the optimal amount of pollution abatement (where $MB = MC$) is low. Any cyanide in public water sources could be deadly. Therefore, the marginal benefit of reducing cyanide is extremely high and the MB curve in the figure would be located to the extreme right where it would intersect the MC curve at or near 100 percent.

CONSIDER:

Markets "fail" in the following situations: (a) monopoly, (b) inadequate information, (c) externalities, (d) public goods, (e) common property resources. Explain what is meant by market failure. Give two examples of each of these sources of failure.

Ans:

Market failure means that the market does not automatically achieve allocative, technical (productive) or dynamic efficiency.

With respect to allocative efficiency, market failure means that net social benefits are not maximized. This occurs when either too much is produced (marginal benefit is less than marginal cost, so each unit is adding more to costs than to benefits) or when too little is produced (marginal cost is less than marginal benefit so each unit is adding more to benefits than to costs). (hint: a diagram would help).

With respect to technical/productive efficiency, market failure means that firms do not produce a given amount of output at lowest per unit resource cost. This would occur when the firm produces too much or too little (i.e., production is to the right or the left of minimum efficiency scale) or when the firm produces at a point above its ATC curve (i.e., when the firm suffers x-inefficiency). (hint: a diagram would help).

With respect to dynamic efficiency, market failure means that an industry does not exploit possible product and process innovations. It is hard to measure failure in this regard because the economist cannot easily identify what is "possible."

Give two examples of each of these sources of failure.

(a) monopoly: natural monopolies such hydroelectric power, local telephone service, natural gas transmission.

(b) inadequate information: when smokers were uninformed about the dangers of tobacco they consumed too much; when they were uninformed about the benefits of eating high fibre foods, they consumed too little.

(c) externalities: refer to your text.

(d) public goods: remember a true public good has very low marginal cost, suffers from non-excludability, and is indivisible. Examples are national defense, police service, a lighthouse.

(e) common property resources: These are resources that nobody owns. As a result there is over consumption. Examples are the air, some streams and rivers, and in BC, the salmon.