

Name _____

Student # _____

Professor Valerie Ramey
Econ 130, Fall 2010

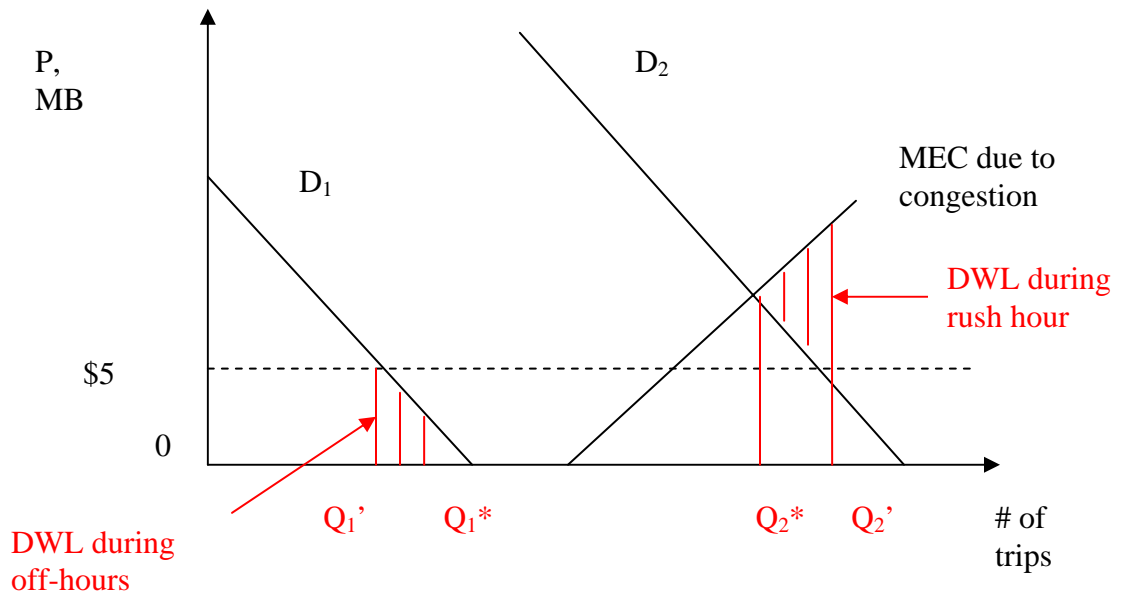
Midterm #2 - Version B

This exam has 50 points. For any numerical problems, you must show your work in order to receive credit. In sentence questions, fill in the blanks.

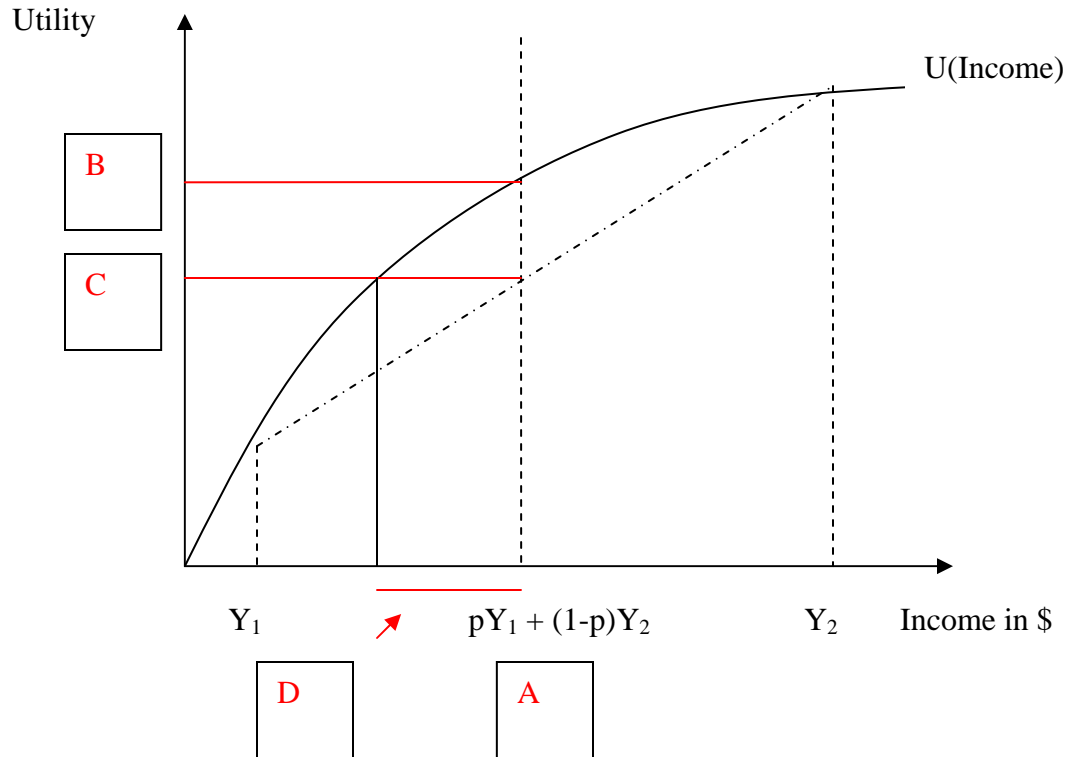
1. Suppose a bridge charges a toll of \$5 per car all hours of the day. Demand is given by D_1 during off-hours and D_2 during rush hour. Assume that driving a car across causes 0 depreciation of the bridge. On the graph below:

A. (2 points) Label the optimal number of trips at each time of day (Q_1^* and Q_2^*).

B. (6 points) Show the deadweight loss or inefficiency triangle (if any) at each time of day.



2. (12 Points) Sam currently receives income Y_1 with probability p and Y_2 with probability $1 - p$. Sam's utility function is shown on the following graph.



Answer the questions below by putting the letters of the question in the proper spot on the correct axis of the graph. Draw lines where needed to clarify.

- A. What point represents the expected value income?
- B. What point represents the utility of the expected value of income?
- C. What point represents expected utility of income?
- D. Suppose an insurance company sold a policy that guaranteed Sam that he would receive the expected value of income for certain. However, Sam would have to pay an insurance premium, which would be subtracted from his certain income. Show the segment on the graph that represents the maximum amount of the premium (in \$) that the company could charge and leave Sam with the same expected utility as he has now.

3. Suppose there are 3 roommates (A, B, and C) deciding which size (Q) of plasma TV to buy for their apartment. The individual marginal benefits are given by:

$$\begin{aligned} MB_A &= 100 - 2 \cdot Q && \text{for } 0 \leq Q \leq 50 \\ &= 0 && \text{for } Q > 50 \end{aligned}$$

$$\begin{aligned} MB_B &= 80 - 2 \cdot Q && \text{for } 0 \leq Q \leq 40 \\ &= 0 && \text{for } Q > 40 \end{aligned}$$

$$\begin{aligned} MB_C &= 70 - Q && \text{for } 0 \leq Q \leq 70 \\ &= 0 && \text{for } Q > 70 \end{aligned}$$

where Q denotes the size of the TV in inches.

A. (6 points) Give the equations for the marginal social benefit MSB, being sure to state the proper domains for Q.

$$\begin{aligned} MSB &= 250 - 5Q && \text{for } 0 \leq Q \leq 40 \\ &= 170 - 3Q && \text{for } 40 \leq Q \leq 50 \\ &= 70 - Q && \text{for } 50 \leq Q \leq 70 \\ &= 0 && \text{for } Q > 70 \end{aligned}$$

B. (4 points) If the price per inch is equal to \$150, what is the socially optimal size Q^* ?

Equations for determining Q^* :

$$MSB = 150$$

$$Q^* = 20$$

C. (6 points) Suppose the roommates set up majority rule to decide the size of TV they should buy. The cost is split equally between the 3 roommates. The largest size that gets the majority of votes wins. What size will be chosen?

Equations:

$$MB_A = 100 - 2 \cdot Q = 50 \quad \text{so A votes for up to } Q = 50$$

$$MB_B = 80 - 2 \cdot Q = 50 \quad \text{so B votes for up to } Q = 15$$

$$MB_C = 70 - Q = 50 \quad \text{so C votes for up to } Q = 20$$

20 is the greatest size that gets 2 of the 3 votes.

Numerical
answer =

20

D. (4 points) If Lindahl taxes were used instead, what would Roommate A's tax share be?

Equations:

$$MB_A = 100 - 2 \cdot Q = 100 - 2(20) = 60 = t_A \cdot 150$$

$$\text{So } t_A = 2/5$$

Numerical answer:

$$t_A = 2/5$$

4. Questions on health care.

A. (6 points) The U.S. spends 14 - 19 percent of its GDP on health care. There is a substantial amount of evidence that we are not getting what we pay for in the U.S. For example, despite spending more on health care, the U.S. has lower life expectancy than many other industrialized countries that spend less. Also, the fact that within the U.S. spending per person over 65 varies dramatically across regions (even after adjusting for differences in age, race and diagnoses) suggests that much Medicare spending is unwarranted.

(We also accepted other answers, such as the Rand Study that found that the institution of Medicare did not increase life expectancy conditional on reaching age 65, etc.)

B. (2 points) How does the new health care reform try to deal with the adverse selection problem? (Answer in one sentence)

It requires everyone to buy health insurance or pay a penalty.