

Due: Oct 9, 2002

Health Economics  
Economics 156  
Prof. Jay Bhattacharya

### Problem Set 1

#### A. Risk Aversion

Consider a risk averse consumer with probability  $p$  of becoming sick. Let  $I_s$  be the consumer's income if he becomes sick, and let  $I_{ns}$  be his income if he does not become sick, with  $I_s < I_{ns}$ .

Suppose the consumer cares only about his expected utility of income, which is given by:

$$\text{Expected Utility} = pU(I_s) + (1 - p)U(I_{ns})$$

1. What does risk aversion imply about the consumer's marginal utility of income,  $\partial U / \partial I$ ?

Draw the consumer's utility curve, showing how utility changes with income.

On this same graph, show the consumer's utility when he is sick and when he is well.

Finally, show the consumer's expected utility at different levels of  $p$  (the probability of becoming sick).

2. Since the consumer is risk averse, presumably he could raise his expected utility by buying an insurance plan.

Actuarially fair plans are those insurance plans where the insurance company makes no profit. Full insurance in this case means the consumer has the same income whether or not he is sick.

What is the premium that the consumer pays for an actuarially fair full insurance plan? What is the payment by the insurance company when the consumer is sick? What is the payment if he is well?

3. Show the consumer's gain in expected utility from buying an actuarially fair full insurance plan on a copy of your graph from question one.

What happens to this gain in utility as the probability of illness approaches zero (the consumer is certainly well)?

What happens to this gain in utility as the probability of illness approaches one (the consumer is certainly sick)?

4. Given your answer to the previous question, would consumer welfare be enhanced by a government requirement that everyone buy insurance against lost income due to the common cold, which everyone gets at some time in their life?
5. Show on your graph the highest premium consumers would be willing to pay for insurance (extra credit if you can show all this using algebra).

What would the insurance company's profits be if they charged this premium, and consumers bought it?

What might constrain insurance companies from charging this maximum premium?

### **B. Positive vs. Normative**

For each of the following statements, indicate whether the statement is making a positive point or a normative point. For each statement, suggest some government policy that someone who believes in the statement would probably support, if any. Limit your answer to one or two sentences per statement.

1. It is wrong for anyone to be denied health care, even if they cannot pay for it.
2. Raising the marginal tax rate on the rich will make health insurance cheaper for them.
3. Sanitation is more important than health care in promoting the average health of the population.
4. People should be allowed to see the doctor of their choice.
5. Doubling the price of a doctor visit reduces the demand for doctor visits by 10%.
6. The government should not subsidize health insurance for people who have more than \$1 million dollars in savings.
7. My utility function has the following elements: health, video games, health care.

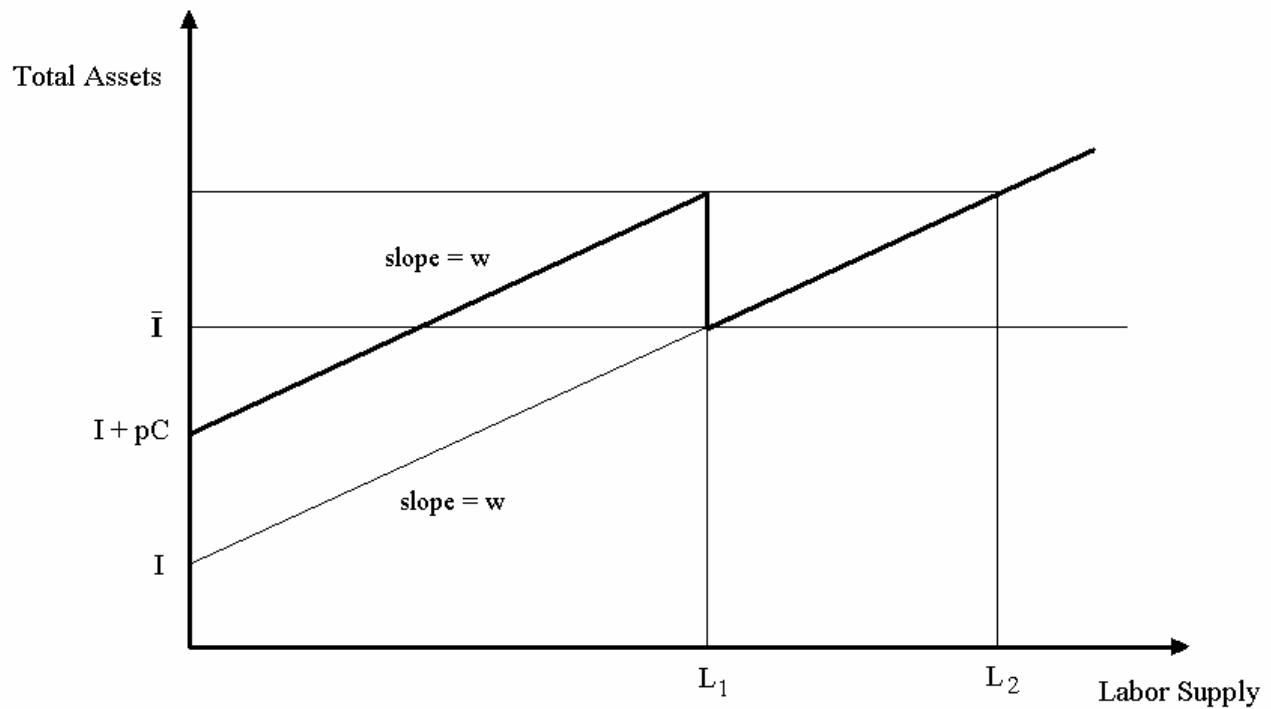
### **C. Labor Market Disincentives of Medicaid**

Let

$\bar{I}$	= the Medicaid income-eligibility threshold
$I$	= non-earnings income
$p$	= price of health care
$C$	= quantity of health care transferred
$w$	= wage
$L$	= hours of work per year

Consider the following figure, which we used in class to discuss the labor market disincentive effects of the Medicaid program:

Figure 1: Labor Market Disincentives of Medicaid



When income from earnings plus non-earnings income is above  $\bar{I}$  (that is,  $I + wL > \bar{I}$ ), eligibility for Medicaid (and the transfer of  $C$ ) is lost. When hours of work are between  $L_1$  and  $L_2$  hours, the worker's total assets is less than when hours of work is less than  $L_1$  or greater than  $L_2$ . Thus, workers have no incentive to work between  $L_1$  and  $L_2$  hours.

1. Suppose the state reduces the Medicaid income eligibility threshold,  $\bar{I}$ .
  - a. Would this make it easier or harder for people to qualify for Medicaid?
  - b. What would happen to the size of the region where workers have no incentive to work?
  - c. Would  $L_1$  increase, decrease or stay the same? What about  $L_2$ ?
2. Suppose the state makes Medicaid more generous. That is, it increases  $C$ .
  - a. What would happen to the size of the region where workers have no incentive to work?
  - b. Would  $L_1$  increase, decrease or stay the same? What about  $L_2$ ?