

EC387 Home work assignment 3

1. This problem is based on Akerlof's Lemon's model

Suppose that there are only three types of consumers and consider a one period insurance choice problem in which there is only one health plan, and it offers full insurance.

| | Expected cost to the Insurer: |
|------------------------|-------------------------------|
| Healthy, Low cost (L): | \$1000 |
| Medium Cost sick (M): | \$3000 |
| High Cost (H): | \$5000 |

Assume that there is an equal number of each type in the population.

a) what is the expected cost of insuring the full population? This is the breakeven premium for a health plan with no administrative costs charging actuarially fair premiums.

b) Assume an actuarial fair insurance is charged, and that each type is risk neutral and hence only values health care spending at its expected cost to the health plan

What will happen if the health plan offers to insure the full population at the actuarially fair premium and consumers are allowed to not buy insurance? What will be the market equilibrium if only full insurance is allowed.

c) Now assume that consumers are risk averse, and are willing to pay 50% more than the expected value of their expected health insurance cost as the premium. Calculate the willingness to pay for insurance for each of these three types of consumers.

What happens in this scenario if a health plan attempts to offer insurance at an actuarially fair premium? What is the equilibrium.

d) Now assume that in addition to having risk averse consumers, there are administrative costs equal to 20% of the expected costs. (This is a typical rate for small plans in the US.) In this scenario, the health plan is not willing to offer actuarially fair insurance, but instead will add these costs onto the premium offer. Note that this administrative cost/profit does not affect the value of the insurance to consumers, only affects premiums.

What happens in this scenario with risk averse consumers? What is the equilibrium.

e) Continuing to assume administrative costs, how much of a penalty (or tax) on those not buying insurance will the government have to charge in order to make all three of the risk averse groups willing to buy insurance and result in an equilibrium in which everyone is insured?

f) Comment on how this problem is related to the uninsurance problem in the US?

2. This problem is based on the Einav and Finkelstein JEP 2013 model of adverse selection.

Assume that there are 10,000 people in a market to be insured. The number of people wanting to buy insurance (the demand for insurance) is

$$N = 10000 - \pi \text{ where } \pi \text{ is the premium.}$$

a) What is the highest premium that anyone is willing to pay to buy insurance? At a zero premium, how many people in the market buy health insurance?

b) Solve for the inverse demand function that expresses Premium π as a function of number of enrollees N .

c) Assume that the marginal cost of people as they start to buy insurance is as follows

$$MC = 3000 - N/2$$

Draw the marginal cost function on the same axes as the demand function. Do the two cross? What is the significance of this crossing point?

d) Calculate the average cost function for people in this plan as a function of N and add it to the diagram. At what quantity N does it cross the demand curve? What is the premium at this quantity?

e) If there is no government regulation or interference in this market, and premiums are based on the average cost of enrollees, then how many people will buy insurance and what will be the premium?

f) At what subsidy will the socially optimal number of people buy health insurance in this market?

g) At what fixed dollar tax will everyone want to buy insurance in this market? That is, people choose to either pay the tax or pay the premium. How much revenue will the government raise through this tax at this rate?

h) How does this problem relate to US Health insurance problems?