Imperfect Information in Health Care Markets

Exercise Session 15 - Q & A

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Overview

1. Insurance Demand
2. Selection
3. Rothschild-Stiglitz
4. Genetic Tests
5. Advantageous Selection
6. Moral Hazard
7. Supplier Induced Demand
8. Misc/Further Questions

Insurance Demand

Q - Exercise 6 (Session 4)

- In this exercise, we saw that CE is decreasing when η increases. But the fraction is negative, so shouldn't it become less negative when η increases? In other words, shouldn't it be the case that CE increases when η increases?

A

- First, note that η appears twice in the term (also in the nominator!). Furthermore, the natural logarithm will give a negative number when you plug in a value smaller than 1 (which will be the case when η is large).

Insurance Demand

Q - Exercise 9 (Session 5)

- How do we know that we do not get the guaranteed income also when having an insurance?

A

- You are guaranteed an income of 1500 that you can spend for consumption. Insurance (in this exercise) is a choice, so buying an insurance is seen as consumption, just like every other good.

Q - Exercise 10e (Session 5)

- Here, we are setting AC=WTP. In the lecture, we learned that the equilibrium is at the intersection of AC and D(x). Why didn't we set AC=D(i)?
- How did we get the demand function in this exercise?

A

- What you learned in the lecture is perfectly right. In practice, you will be able to derive the demand curve by eliciting the WTP of all people. At a given price p, everyone with a WTP above p will demand the good. This is how you get total demand at any given price p.
- Three steps: 1. See that if someone buys insurance, all higher risk people will also buy it. 2. Find the lowest risk person that buys insurance. 3. Calculate "how many" people these are.

Rothschild-Stiglitz

Q - Exercise 12 (Session 7)

- Why is the area below the IC of the high type and above the isoprofit curve B not also preferred by the high types and should thus belong to the red area?

A

- This area would indeed be preferred by the high types, but this will exactly pose a problem: The high types will buy a different contract and insurances might suffer losses from them in this case (the isoprofit curve for high types is not drawn here!). The red area is the area of profitable deviation contracts for the insurances: Low types will buy these contracts, high types will not and insurances will make positive profits from the low types.

[In the drawing for high types: This area might not always exist (e.g. for B being full coverage)]

Q - Exercise 13 (Session 7)

- b) Could we see the complete calculation for the low type? (It was only shown for the high type in the session)
- d) Why is full coverage the best option for both types (high and low)?
- e) Can we see the calculations in green more extensively? Some steps are unclear to us, for example the calculation of the utility of (p_l, q_l).
- e) Why is the high type indifferent between (q_l, p_l) and (q_h, q_l) in the RS-model? Does he prefer the point where the slope of the indifference curve is steeper?
- Necessary to calculate p_l and q_l explicitely? Why only $u(W - p)$ for high types and complete formula for low types?

A

- Really? It is literally the same calculation, only with 1/2 and 1/2 replaced by 1/4 and 3/4.
- People are assumed to be risk averse (concave utility functions). This is why at a fair premium, they prefer more coverage over less coverage.
- We discussed this one week later (see slides)
- Indifference means that he does not prefer any of the two points. We just make the assumption that in this case, he will choose the contract with more/full coverage so that the insurances make no losses (instead, think about making the low type contract marginally more expensive to resolve the indifference). We need the high type to be indifferent between both contracts in equilibrium. If he would strictly prefer the low type contract, insurances would make losses from high types. If he would strictly prefer his contract, insurances could

A (cont.)

make a better offer on the zero profit isoprofit-line for low types.

- Yes, this is what this exercise was about. High types have a full coverage contract, low types do not.

Q - Exercise 14, Case i) (Session 7)

- Why is the situation more efficient?

A

- Both the high type and the low type are risk averse and have a WTP above their expected cost. Hence, it would be efficient to give both types a full coverage insurance contract. However, this is not possible as we cannot stop the high risk type buying the low risk types contract (cheaper premium). With the intervention, the low risk types get a higher coverage and are closer to their desired full coverage contract. In this sense, the situation is more efficient.

Q - Exercise 15 (Session 8)

- Do all types (high and low) pay the same premium in the pooling equilibrium?
- Why is the RS-equilibrium there? Why not at the intersection point?

A

- Yes. Everyone gets the same contract in the pooling equilibrium. This means: Same coverage level, same premium.
- Because the line is the zero profit pooling line. The contract for the low type is on the zero profit line for low types, which is below the zero profit pooling line.

Genetic Tests

Q - Exercise 17b (Session 8)

- Why is the equilibrium contract given by the RS-model?

A

- Insurances are not allowed to make contracts contingent upon test results. Hence, the situation is as if insurances did not know the risk types of people, which is exactly the RS-model setting.

Advantageous Selection

Q - Exercise 23 (Session 10)

- What is the efficient solution for advantageous selection?
- Why is the equilibrium inefficient/why is there too much insurance in equilibrium? Does D=WTP hold in this case?

A

- The efficient solution/situation in the insurance context always is the following: Those people with WTP above their expected costs get an insurance and the others do not get an insurance. Hence, the definition of efficiency does not depend on the selection that is going on. We saw that the equilibria under adverse and advantageous selection are both not efficient, due to underinsurance and overinsurance, respectively.
- There is too much insurance in equilibrium, because those people who really want to buy an insurance (even at high costs) have very low risk. Hence (under perfect competition insurances make zero profits), they pay large parts of the costs of higher risk people. This makes it possible for insurances to offer the contracts at lower premia, which leads to more people buying an insurance. Among these "more" people are also those whose WTP is below their expected costs, but as all the low risk types make the insurance cheap, the premium is still below their WTP.

Moral Hazard

Q - Exercise 26 (Session 11)

- Why did we only take the derivative of a part of the utility function, so only $-0,5(2-s-t)^2$ and not $cons$? As $cons = 4 - t$ also contains a t, which can be derived.

A

- The approach of finding optimal behavior by setting marginal benefit = marginal cost is an economic one because it uses economic intuition. In order to use it, you should understand which parts of the utility function reflect "benefit" and which reflect "costs". If this is not obvious to you, you should probably just use the mathematical approach and take the derivative of the whole utility function. In the above exercise, consumption ($cons$) is decreased when more money for treament (t) is spent. This is why the reduction in consumption reflects the marginal costs of treatment and is not part of the marginal benefit.

Q - Exercise 28 (Session 11)

- The “note” is unclear to me. What exactly does it say?

A

- The note says that we are looking at a social dilemma here. For every individual, it is optimal not to be careful, so nobody will be careful. However, this leads to a higher expected loss per person, every person loses $15/4=3{,}75$ more on average. As this additional cost could have been prevented by "paying" just 1, the full coverage insurance will lead to huge additional losses for society overall.

Supplier Induced Demand

Q - Exercise 32 (Session 13)

- a): If $(p - 1 - \gamma) > 0$, more inducement results in more utility and $s > 0$. How do we know we go for maximal inducement $1 - M/\delta$? I see that we wouldn't have been able to solve for s, as it disappeared during the derivation, but is this a sufficient reason to assume maximal inducement?
- a): Why is $s = 0$ in the case $M/\delta + s > 1$? Difference to lecture?!
- c): For $p > 1$ we induce, this is clear. But if we found $s = (p - 1)/\gamma$ to be optimal, why do we choose inducement by minimizing $(p - 1)/\gamma$ and $1 - M/\delta$? Why do we have to consider the second option? Is this the choice between interior and maximal inducement? I would be glad, if you could also give us an intuition why maximal inducement comes first in the graph and only then we have interior inducement.
- d) Can we briefly repeat this exercise?

A

- Answer: In this case, $\frac{\partial u}{\partial s}$ is always positive. This is why more inducement is always better and the physician goes for maximal inducement

  $$s = 1 - \frac{\mu}{\delta}.$$

- This is the minimum possible inducement. The physician induces the least amount possible, as the derivative is always negative. This means that "inducing always hurts".
- Yes, the physician has only limited working time, and she cannot work more than a time amount of 1 in the model. This is why we take the minimum of these two numbers.
- Yes.

Q - Exercise 34 (Session 14)

- What is the income effect? Why does an increase in y lead to a reduction of s_1 due to the income effect here?

A

- Income effect generally describes how a person changes her behavior when she has a higher income. In this exercise, the higher income is generated by the increase in p_1 (as this means that the same behavior in terms of inducement leads to a higher income). With a higher income, the physician is less motivated to induce (as there is a cost of inducement as well). This means that he will induce less/reduce s_1.

Misc/Further Questions

Q - Arc elasticity

- How/when to use arc elasticity?

A

- Answer questions like: "How does one variable change as a response to a change in another variable between two different points in time?" Mostly, economists are interested how (sensitively) demand reacts to changes in some other relevant variables.

Q - Mixed questions

- How to determine $Q_{efficient}$?
- How to compute AC and MC?
- What happens to premium and coverage in the equiilbrium with taxes or subsidies?

A

- Just “count” the consumers for which WTP>MC holds.
- AC=Average costs=Expected costs of all insured/Number of insured;
  MC=Marginal cost (of a person) = Expected cost of that person
- With perfect competition, insurances will give pass the taxes or subsidies to consumers. This means that insurances get more expensive with taxes and less expensive with subsidies. Hence, premia change and this might also affect the optimal coverage level in the model.

Q - RS-model

- In the RS-model, can we assume that adverse selection is present? Reasoning: ICs of high risk types are steeper such that they have a higher risk aversion than low types. Hence, their WTP for insurance is also higher.

A

- Wrong reasoning: Steepness is measured by the first derivative, but it is the second derivative that drives the level of risk aversion.

Q - Selection

- Is it correct that there is always advantageous selection present, if MC>AC? And if AC>MC, we have adverse selection in general?

A

- No. Selection is about who is buying an insurance in the end. If those will be the people with low risks, we call this advantageous selection. If it will be the people with high risks, we call it adverse selection. In both cases, there will be people with MC<AC and also with MC>AC buying the insurance (when AC refers to the average costs of all insured people).

Q - Expected utility from insurance contract

- Is the expected utility of an insurance contract always calculated as u(W-p)?

A

- No, only when the individual has a full coverage insurance contract with premium p.