Imperfect Information in Health Care Markets

Exercise Session 6 - Rothschild-Stiglitz

Marius Gramb

Exercise 10 g)

Consider an insurance subsidy to insurers, i.e. each insurer receives for each sold insurance a subsidy payment s. How high does s have to be to ensure efficiency?

Exc. 10 g)

With the subsidy, the average costs of the insurance are now given by

$AC^S(i) = AC(i) - S$ → new average costs with subsidy

In equilibrium, $AC^S(i) = WTP(i)$, where i is the lowest type who buys insurance.

To get efficiency, we want $i = 0$.

$\Rightarrow AC^S(0) \overset{!}{=} WTP(0)$

$\Leftrightarrow AC(0) - S \overset{!}{=} 0$ → WTP of 0 type (plug in $i=0$ into $WTP(i)$)

$\Leftrightarrow 800 \cdot (\frac{1}{2} + 0) = S$

$\Leftrightarrow 400 = S$

To ensure efficiency, the subsidy payment has to be 400.

Exercise 10 h)

Consider an insurance mandate (without subsidies), i.e. everyone is forced to buy an insurance contract. What is the equilibrium insurance premium? Who will benefit from the mandate? Who will lose out with the mandate?

Exc. 10 h)

In equilibrium under perfect competition, insurances will make zero profits.

$$\Rightarrow \quad p \overset{!}{=} AC(0)$$

$$\Rightarrow p = 400$$

Who benefits from the mandate?

→ Everyone with a WTP of more than 400 benefits.

Who is worse off with the mandate?

→ Everyone with a WTP of less than 400 is worse off.

Exercise 10 i)

Suppose insurers can now distinguish two groups: The people $i \geq 0.3$ and the people $i < 0.3$. Assume that insurers are allowed to offer different contracts to these two groups. Consequently, there are now two separate markets. What is the equilibrium on the "high risk market"? What is the equilibrium on the "low risk" market? Is the new situation more or less efficient than the one considered in the previous subquestions? Who benefits from group discrimination and who does not?

Exc. 10 i)

In the equilibrium on the "high risk market" ($i \geq 0,3$), everything is as before.

(Remember that only people in $[0,38 ; 0,5]$ bought the contract)

What happens on the "low risk" market?

If one type i in $[0; 0,3)$ buys a contract, everyone in $(i ; 0,3)$ will also buy this contract.

The new average costs for the insurance in this low risk market are given by

$$AC^{new}(i) = 1600 \cdot \frac{0,3 + i}{2} = 800\,(0,3 + i)$$

In equilibrium: $AC^{new}(i^*) = p^* = WTP(i^*)$

$$\Rightarrow 800\,(0,3 + i^*) = 2000\, i^* - 400\, i^{*2}$$

$$\Leftrightarrow 400\, i^{*2} - 2000\, i^* + 800\, i^* + 240 = 0$$

$$\Leftrightarrow i^{*2} - 3\, i^* + 0,6 = 0$$

→ as we look for a type $i^* \in [0; 0,3)$

$$\Rightarrow i^* = 1,5 - \sqrt{2,25 - 0,6} \approx 0,215$$

$\Rightarrow$ on the low risk market, everyone in $[0,215 ; 0,3)$ buys a contract at premium $800\,(0,3 + 0,215) \triangleq 412$.

- this situation is more efficient as more people are insured
- people in $[0{,}215; 0{,}3)$ benefit as they get an insurance at a premium below their WTP
- everyone else is as well off as before

Exercise 10 j)

With the previous subquestion in mind, what happens if insurers can identify people better? (For example, distinguish more and more subgroups as in the previous subquestion.) What are the consequences for welfare? Who benefits and who loses?

Exc. 10 j)

More groups: problem of adverse selection essentially disappears, as $AC < WTP$ for all / nearly all people

→ (almost) everyone buys insurance

⇒ welfare increases, people in $[0; 0,38]$ will benefit compared to one group,

but people in higher groups might lose

(for example those who are close to 0,5 as they will be offered a higher premium contract than in the one group case)

Exercise 11

You work for a profit maximizing health insurer which recently understood the problem of adverse selection. Your boss asks you what to do to increase/maintain profits in light of the adverse selection problem. What do you answer?

Exc. 11

Problem of adverse selection: attraction of high risk consumers

→ tailor insurance plan toward healthy people:

- bonus programs for e.g. fitness courses, ...
- pay back part of the premium in case no case was used
- maybe offer partial coverage contracts

→ make it unattractive for chronically ill and unfit people

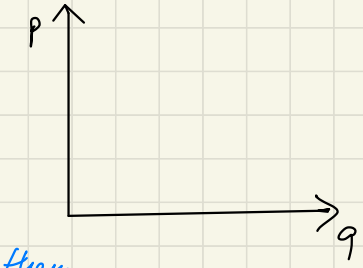
- signing insurance contract online / 3rd floor without elevator
- build office in neighborhood with high socioeconomic status / or advertise especially there
- do not cover certain brands of medication for chronic diseases

The Rothschild-Stiglitz Model

Starting point: Insurers are aware of the adverse selection problem (People that buy insurances typically have higher risks)

Main idea: Insurers offer a menu of contracts (coverage-premium pairs) that are designed in such a way that different risk types self-select into the contract designed for them

→ The RS-model analyses how these contracts are designed in the simple case of two possible risk types (high + low)



The Players: Insurances, High risk types, Low risk types

Insurances: Want to make profits (but will make zero profit due to perfect competition assumption)

→ Their zero-isoprofit-lines indicate which contracts are profitabel for them (depending on the type buying the contract)

High + Low risk types: Want to get the best possible contract (higher coverage + lower price)

→ Their indifference curves indicate which contracts they prefer over other contracts