Imperfect Information in Health Care Markets

Exercise Session 10 - Moral Hazard

Exercise 24

Ambulatory mental health care was the most price sensitive element of health care in the RAND health insurance experiment. How do you think the market for mental health care has changed since the 1970s? How does this affect the price sensitivity? What evidence would you look for to support your claims?

Exc. 24

Changes in the market for mental health care:

- less social stigma of mental health care nowadays
- psychiatry has turned heavily towards psychopharmaca and away from psychology
- regulatory environment has changed (harder to get renewal for prescription)

effect on price sensitivity is unclear

However: If price sensitivity would have changed, insurances would have realized first and changed their offer / coverage

↳ they did not, so price sensitivity should be the same

Exercise 25

Dental care was quite price sensitive in the RAND health insurance experiment. This effect was particularly large in the first year. What is the explanation for this? What are the implications?

Exc. 25

Explanation: Randomly enrolled people had neglected dental care for some time and thus took a lot of dental care when they had low copayment rates in the first year. Later, the demand went down since they already took it.

$\Rightarrow$ studies need a sufficiently long time horizon to give reliable results

Exercise 26

Health insurance plans can often be described by a deductible D, a copayment rate c and a maximal out of pocket amount M: Up to D all expenditures are paid by the insured, for every \$ spent between D and M the insured pays c and the insurance bears all expenses above M.[1] Assume that consumers act as to maximize the utility function $cons - 0.5(2 - s - t)^2$ where $cons$ is consumption, i.e. all money left to the consumer after paying for treatment $t \in [0, 2 - s]$, and $s \leq 1$ is a health state. Assume that the consumer has an initial wealth of 4 (net of the insurance premium) and therefore consumption is $4 - t$ if he has no insurance.

a) Suppose the consumer has no insurance (or equivalently $D > 4$). How much treatment will he buy in health state $s \in [0, 1]$?

[1] Hence, the total copayment if expenditures are x is x if $x \leq D$; is $D + c(x - D)$ if $D < x < M$ and is $D + c(M - D)$ for $x \geq M$.

Exc. 26

a) To find the optimal treatment decision t (depending on s), we look for the amount where the marginal benefits (MB) equal the marginal costs (MC)

$$MB \overset{!}{=} MC$$

$$\Leftrightarrow \quad 2-s-t = 1$$

$$\hookrightarrow = \frac{\partial(-0{,}5(2-s-t)^2)}{\partial t} \qquad \frac{\partial t}{\partial t}$$

$$\Leftrightarrow \quad t = 1-s \qquad (\text{which is in } [0,1] \text{ for } s \in [0,1])$$

$\rightsquigarrow$ consumer will buy treatment of the amount $t = 1-s$.

Exercise 26

b) Suppose the consumer has a coinsurance rate of $c \in [0, 1)$ while $D = 0$ and $M = \infty$. How much treatment will he buy in health state $s \in [0, 1]$?

c) Now let $D = 0.5$, $c = 1/2$ and $M = \infty$. How much treatment will the consumer buy in health state $s \in [0, 1]$?

d) Think now about expected expenditure at the time of insurance purchase (i.e. we do not know the health state yet). Under which conditions on the distribution of health states will an increase in the deductible reduce expected expenditures? What does this imply for the effectiveness of small deductibles in reducing expected expenditures?

Exc. 26

b) With a copayment rate of $c \in [0,1)$, we get:

$$MB \overset{!}{=} MC$$

$\Leftrightarrow 2-s-t = c$ → for 1 € of treatment, I only pay c€ $(c<1)$

$\Leftrightarrow t = 2-c-s$ (this is >0, since $s \in [0,1]$)

c) There are now 2 relevant cases depending on t.

First case: $t \leq 0{,}5$ → deductible D

→ $MB \overset{!}{=} MC \Leftrightarrow 2-s-t = 1 \Leftrightarrow t = 1-s$ (only consistent, if $s \geq 0{,}5$)

Second case: $t > 0{,}5$

→ $MB \overset{!}{=} MC \Leftrightarrow 2-s-t = c \overset{c=\frac{1}{2}}{\Leftrightarrow} t = 1{,}5-s$ (always consistent as $s \in [0,1]$)

So in total, for $s < 0{,}5$, it is clear that we take $t = 1{,}5-s$ as a treatment choice.

For $s \geq 0{,}5$, we compare the utilities of spending $t = 1-s$ and $t = 1{,}5-s$:

$u(1-s) = 4-(1-s)-0{,}5 \cdot 1^2 = 2{,}5+s$ (for $s \geq 0{,}5$, $1-s$ is $\leq$ the deductible $0{,}5$)

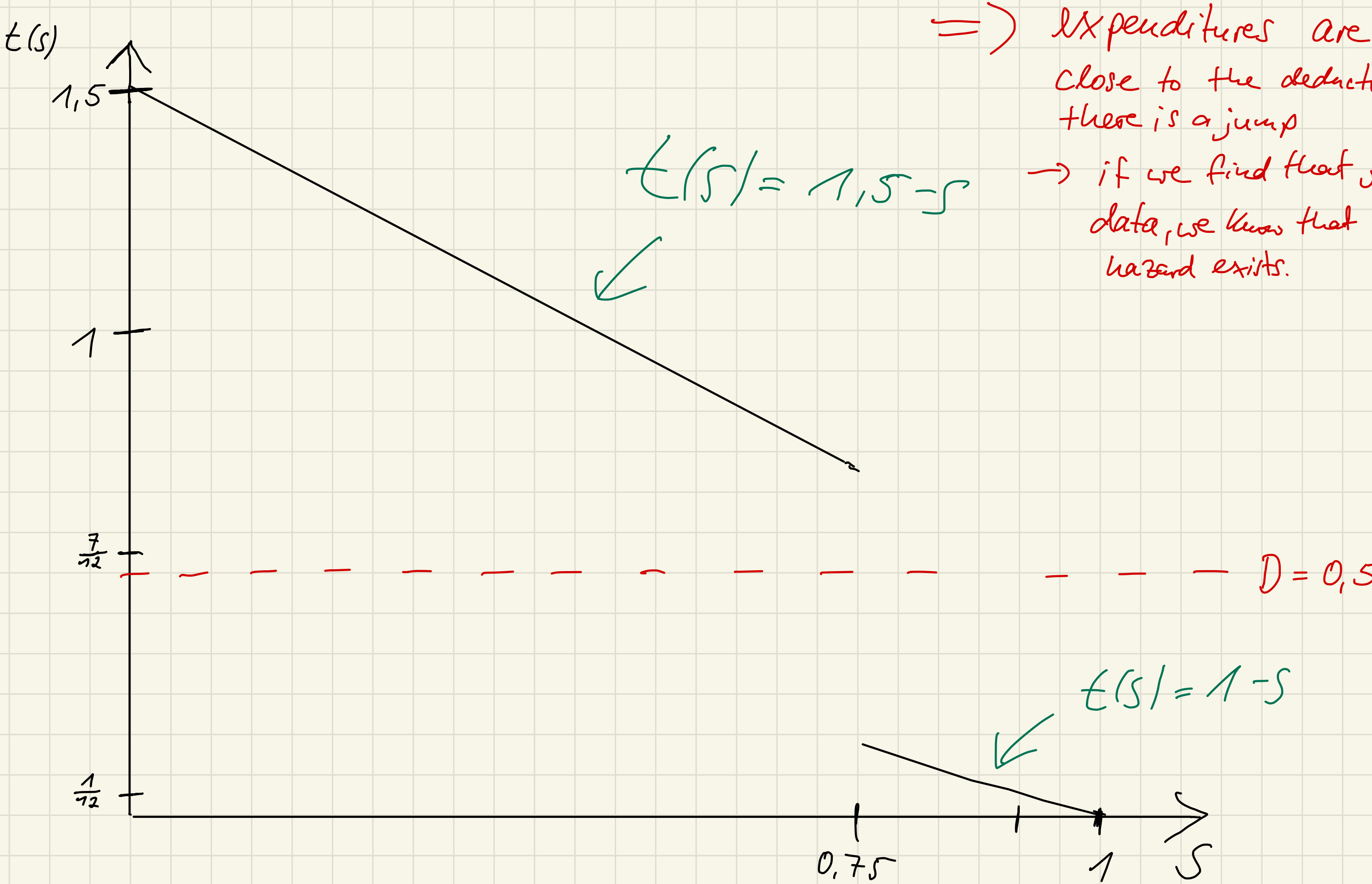
$u(1{,}5-s) = 4-\boxed{\left(0{,}5+\frac{1{,}5-s-0{,}5}{2}\right)}-0{,}5\left(2-s-(1{,}5-s)\right)^2 = 2{,}875+\frac{s}{2}$ (for $s \in [0{,}5;1]$, we have $1{,}5-s \geq 0{,}5$)

From this, we can see that for high s (e.g. $s \approx 1$), we prefer $t = 1-s$ and for low s, we prefer $t = 1{,}5-s$.

The threshold is given by $2{,}5+s = 2{,}875+\frac{s}{2}$

$\Leftrightarrow \frac{s}{2} = 0{,}375 \Leftrightarrow s = 0{,}75$

Exc. 26 c)



⇒ Expenditures are never close to the deductible, but there is a jump

→ if we find that jump in the data, we know that moral hazard exists.

$1€$ $5€$

26. d) Consider an increase in the deductible from D_1 to D_2. Then, expenditures are only affected if health states in which we want to spend between D_1 and D_2 (under D_1) have positive probability / share in the population.

Otherwise, there is no difference between D_1 and D_2.

$\Rightarrow$ small deductibles have practically no effect on expenditures as they can prevent only small expenditures and have no effect on big spenders that cause the majority of health care expenditures.