31E99906 Capstone Microeconomic Policy
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Return method: through mycourses by the deadline

Problem Set 3: Question 1

Aalto University cares about students' dental health. University offers the following insurance contract to all students: the contract covers the dental procedures needed in case of a tooth ache (i.e., filling). The cost of this care is $d > 0$. All students have the same wealth $w > 0$ and their utility is $u(w) = \ln w$. Individuals may have different probabilities for the need of the care. Each individual knows her or his probability, and we denote it by p. You may think that the time period is one year, so p is the annual probability that the dental care is needed and the contract is annual as well.

1. Suppose first that there is no insurance contract. What would be the individual's expected utility? You may set $p = .5$, $w = 3$, and $d = 2$ if you find it easier. Can you define the maximum that the individual is willing to pay to avoid the risk of experiencing the cost?

2. Consider then the contract. Suppose that Aalto insurance company knows p and offers a fair-odds contract: the premium depends on p so that if you buy I units of coverage, the payback in case of the event is I and the premium payment in case of no event is pI. How much coverage will the consumer buy?

3. Suppose now that Aalto does not observe the student's risk profile p. The average student has $p = .5$ and Aalto insurance decides set premium $.5d$ which is the expected cost of treating an average student. The payback is d for any individual in need of the service. Recall that students can differ only in their risk profile captured by p. What type of students will buy this contract?

4. Consider then that Aalto has found ingenious ways to better screen the students. Each student can now be identified to belong into a high

risk ($p > .5$) or a low risk ($p < .5$) group. For high risks, Aalto offers premium $.75d$ (and payback d) and for the low risks the premium is $.25d$ (and payback d). You may think that there are students of all kinds: p takes values in $[0, 1]$. Provide a discussion of the student types that will buy these contracts now. Compare the outcome to the one obtained when only one contract was offered with premium $.5d$. This discussion can be informal.

5. In the previous items you have found student groups defined by the risk type and the decision to buy the contract. Provide a discussion on how their welfare differs from the outcome under one contract offered with premium $.5d$. This discussion can be informal.