

Due: Monday, Oct. 25

1. Thomasina is getting ready to graduate and has two job offers. One offer is to join a large, established company, where she will earn an income of \$54,000 per year. The second offer is from a small Internet company that her parents have just started. She is offered a token salary of \$4,000, but is also promised a bonus of \$100,000 if the company manages to become profitable during the upcoming year. Thomasina assesses the company's chances of success as 50-50. She decides to turn down the start-up company's offer.
  - a) With income on the horizontal axis and utility on the vertical axis, illustrate Thomasina's utility of income function.
  - b) Suppose Thomasina's utility of income function is given by:  $U = I^5$ . The start-up company really wants to hire her. They ask her how high her base salary would have to be (keeping the promised bonus the same) to get her to accept the job. What number does she give them?
  - c) Alternatively, the start-up company says that they cannot offer a higher base salary because of cash-flow issues, but is willing to increase the size of the bonus. How high does the bonus have to be to entice her to take the job?
  
2. A household possesses \$100,000 worth of valuables. The probability that the household is burglarized in any given year is 10%. If a burglary occurs, the household would have to spend \$20,000 to replace the stolen items. The household's utility function is given by  $U(W) = \ln(W)$ .
  - a) What is the actuarially fair insurance premium for such a household? Would this household pay the premium?
  - b) What is the maximum premium this household would pay to purchase burglary insurance?
  - c) Illustrate all of this in a diagram.
  
3. Suppose that there are actions that households can take to alter the probability that a burglary occurs, such as installing and using locks on doors and windows. Do you expect households with insurance to behave the same way as households without insurance? (Hint: read about moral hazard in chapter 19.)
  
4. Suppose that insurance companies are required to charge the same rate for burglary insurance to all homeowners, regardless of any self-protection measures that homeowners take. Are the people who want to purchase burglary insurance likely to represent a random sample of the population of homeowners (with regard to how well-protected their homes are)? (Hint: read about adverse selection in chapter 19.)