Public Economics (ECON 131)
Section #10: Social Security and Insurance

Contents

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1 Key Concepts

- **Social insurance programs** are government interventions in the provision of insurance against adverse events.
- What is **insurance**? Why is it valuable to individuals?
- What is the **expected utility model**? How do you write up an agent's expected utility function?
- What is the **actuarially fair premium**?
- What is **asymmetric information**? What are the implications of asymmetric information in insurance markets?
- What is the difference between **adverse selection** and **moral hazard**? How do they relate to government interventions through social insurance?

2 Practice Problems

2.1 Adverse Selection

Do health insurance and car insurance markets both suffer from adverse selection? Are there reasons why the government should intervene in the health insurance market and not in the car market?

2.2 Moral Hazard

Unemployment insurance in the US typically pays the unemployed 50% of their previous wage for about 6 months. During the recession of 2009 it was extended temporarily to a year. Discuss why unemployment insurance is far from 100% and why the government decided to extend UI during the recession.

2.3 Disability Insurance

Consider an economy where there are three types of people who want to buy disability insurance. Each type has the same health-based risks. They each have a 2 percent chance of being incapacitated due to health risks which are uncorrelated with their risk taking behavior. But the people differ in their hobbies and work. The low-risk types walk to work and have very low risk hobbies. Their outside risk of being incapacitated is 3 percent. The medium-risk types drive to work and actively play soccer on the weekends. Therefore, their non-health risk of being incapacitated is 8 percent. The third type has high risk. They work as firefighters and skydive on weekends. Therefore, their outside risk of being incapacitated is 58 percent. There are equal numbers of each type. Long-term care insurance provides income if they are incapacitated for the rest of their life (there are no additional costs). Individuals have the following utility function over consumption (or income):

$$u(c) = \log(c)$$

Individuals earn $500 if healthy, but only $10 if incapacitated. They make the decision to purchase insurance before the event occurs.

(a) *If the insurance company can differentiate the types, what is the socially optimal level of insurance for each type. [Note: no math is required for this question.]*

(b) *What is the actuarially fair price for the insurance for each group? What is the expected utility of each group given that price if they buy insurance? What is the expected utility if they do not buy insurance? What prices are each groups willing to pay for the insurance? Assume insurers are perfectly competitive.*

(c) *Now assume that the insurance company is not able to differentiate between the three types. Therefore, it offers a policy that fully insures individuals at the same price to all three types. Assuming all three types buy this insurance policy, what is the price for insurance?*

(d) *Prove that with the price you found in part (c), the low-risk type would not be willing to buy the full insurance policy. [Note: use your results from part (b).]*

(e) *Since the low-risk type does not buy the policy, the insurance company cannot offer the policy at the price from part (c). What is the new price for this policy if the risk averse drop out of the market? Who will buy at this price? [Note: show mathematically.]*

(f) *You have demonstrated an example of a market unraveling. Explain the intuition for why it happened.*

(g) *How would results change if the individuals' income is zero when incapacitated?*