MA Game Theory

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Homework 7

Due Weds 19th April

Question 1 Consider an economy with a set of competitive risk-neutral insurers and a population of risk-averse agents with utility function $u(c) = ln(c)$. Agents, whose welfare ex ante is measured by the expected utility of their consumption, face an idiosyncratic risk of loss. In the absence of insurance, agents consume 2 units in the business-as-usual scenario, but they consume only 1 unit in case of an accident. A full insurance contract in this context is a contract that offers an indemnity of 1 consumption unit if and only if the policyholder incur a loss. There are two types of agents. The low-risk type has a probability of accident of 10%, whereas the high-risk type faces a probability of accident of 30%.

1. Under symmetric information, what insurance contracts will be purchased by consumers at equilibrium?
2. Suppose from now on that insurers don't know the types of the agents. They only know the proportion β of low-risk types in the economy. Explain why an allocation in which all insurers offer the same full insurance contract at a premium of 0.2 cannot be a competitive equilibrium in the sense of Rothschild and Stiglitz.
3. Characterize (through necessary conditions) the separating competitive Rothschild-Stiglitz equilibrium when it exists (hint: one type will get full insurance)
4. Describe the condition on β that guarantees the existence of such an equilibrium.

Question 2 Show that the Spence model has two types of semi separating equilibria. Find the set of such equilibria in each case below. Use figures of the type in the lecture notes.

1. Equilibria in which θ_1 chooses an education level e_1 and θ_2 randomizes between e_1 and a higher education level e_2.
2. Equilibria in which θ_2 chooses an education level e_2 and θ_1 randomizes between e_2 and a lower education level e_1.

Question 3 In the Spence model, show that all weak Perfect Bayesian equilibra are also sequential equilibria.