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Microeconomia II
Programa de Pós-Graduação em Economia
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Seção 13.D - Screening

Exercise 1. Consider the screening model of section 13.D. The individuals have two possible productivity levels, $\theta_H > \theta_L > 0$ with $\Pr(\theta = \theta_H) = \nu \in (0,1)$. The jobs may differ in the task level, $t \in [0, \infty)$, but higher task level add nothing to the output of the worker (although it affects the workers utility). The workers utility is given by $u(w,t|\theta) = w - c(t,\theta)$, with

$$c(0,\theta) = 0,\ c_t(t,\theta) > 0,\ c_{tt}(t,\theta) > 0,\ c_\theta(t,\theta) < 0,\ c_t\theta(t,\theta) < 0.$$

There are two competitive firms that can offer a finite set of contracts to the workers. A contract is a pair (w,t). After the contracts are offered, the workers can choose to accept it or not. Suppose that, when indifferent, the workers choose the contract that has the highest wage.

(a) Characterize the subgame perfect Nash equilibrium outcomes of this model with observable productivity.

(b) Show that no pooling equilibrium exists.

(c) Characterize a subgame perfect Nash equilibrium of this model, with unobservable worker productivity, when it exists.

Exercise 2 (MWG 13.D.1). Extend the screening model to a case in which tasks are productive. Assume that a type θ worker produces $\theta(1 + \mu t)$ units of output when her task level is t where $\mu > 0$. Identify the subgame perfect Nash equilibria of this model.

Exercise 3. MWG 13.D.2 Consider the following model of the insurance market. There are two types of individuals: high risk and low risk. Each starts with initial wealth W but has a chance that an accident (e.g., a fire) will reduce her wealth by L. The probability of this happening is p_L for the low-risk types and p_H for the high-risk types, where $p_H > p_L$. Both types are expected utility maximizers with a Bernoulli utility function over wealth of $u(w)$, with $u'(w) > 0$ and $u''(w) < 0$ at all w. There are two risk-neutral insurance companies. An insurance policy consists of a premium payment M made by the insured individual to her insurance firm and a payment R from the insurance company to the insured individual in the event of a loss.

(a) Suppose that individuals are prohibited from buying more than one insurance policy. Argue that a policy can be thought of as specifying the wealth levels of the insured individual in the two states "no loss" and "loss".

(b) Assume that the insurance companies simultaneously offer policies; as in section 13.D, they can each offer any finite number of policies. What are the subgame perfect Nash equilibrium outcomes of the model? Does an equilibrium necessarily exists?

Exercise 4 (MGW 13.D.4). Reconsider the screening model in section 13.D, but assume that

(i) there is an infinite number of firms that could potentially enter the industry and

(ii) firms can each offer at most one contract.

[The implication of (i) is that, in any SPNE, no firm can have a profitable entry opportunity.] Characterize the equilibria for this case.