LECON2112 Advanced Microeconomics II

– Assignment 8 –

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Deadline: Monday, April 22, 2024 at 5pm.

Instructions: To be submitted via Moodle as a single file (including your name and NOMA).

Exercises[1]

13C5. Assume a single firm and a single consumer. The firm's product may be either high or low quality and is of high quality with probability λ The consumer cannot observe quality before purchase and is risk neutral. The consumer's valuation of a high-quality product is v_H; her valuation of a low-quality product is v_L. The costs of production for high (H) and low (L) quality are c_H and c_L, respectively. The consumer desires at most one unit of the product. Finally, the firm's price is regulated and set at p. Assume that $v_H > p > v_L > c_H > c_L$.

(a) Given the level of p, under what conditions will the consumer buy the product?

(b) Suppose that before the consumer decides to buy, the firm (which knows its type) can advertise. Advertising conveys no information directly, but consumers can observe the total amount of money that the firm is spending on advertising, denoted by A. Can there be a separating perfect Bayesian equilibrium, that is, an equilibrium in which the consumer rationally expects firms with different quality levels to pick different levels of advertising?

13Ca. A firm has to decide whether or not to hire a worker. The productivity of the worker is unobservable. With probability λ, the worker is of high type and produces $\overline{\theta}$, and with probability $1-\lambda$, the worker is of low type and produces $\underline{\theta}$, $0 < \underline{\theta} < \overline{\theta}$. Expected productivity is written $E(\theta)$. If the firm decides to hire the worker, there is no flexibility on the wage w, which is equal to $E(\theta)$. Before the firm takes a decision, the worker, who knows her type, can choose a level of education e, which is observed by the firm. The worker's utility function is $u(e,w) = w - c(e|\theta)$ where $c(\cdot)$ is increasing, convex and satisfies $c(0|\theta) = 0$, $c_e(e|\theta) > 0$, $c_{ee}(e|\theta) > 0$, $c_{e\theta}(e|\theta) < 0$. What are the separating weak perfect Bayesian equilibria of this game?

[1]Source: Mas-Colell, Whinston, & Green, 1995. "Microeconomic Theory," Oxford University Press.