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Monitor: não tem
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Microeconomia II
Programa de Pós-Graduação em Economia
FEARP - USP

Seção 14.C - Hidden Information

Exercise 1 (**MGW 14.C.2**)**.** Consider the hidden information model in section 14.C, but now let the manager be risk neutral with utility function $v(w) = w$. Show that the owner can do as well as when θ is unobservable as when it is observable. In particular, show that he can accomplish this with a contract that offers the manager a compensation of the form $w(\pi) = \pi - \alpha$ and allows him to choose any effort level he wants. Graph this function and the manager's choices in (w, e)-space. What revelation mechanism would give this same outcome?

Exercise 2 (**MWG 14.C.7** (J. Tirole))**.** Assume that there are two types of consumers for a firm's product, θ_H and θ_L. The proportion of type θ_L consumers is λ. A type θ's utility when consuming amount x of the good and paying a total of T for it is $u(x, T) = \theta v(x) - T$, where:

$$v(x) = \frac{1 - (1 - x)^2}{2}$$

The firm is the sole producer of this good, and its costs of production per unit is $c > 0$.

(a) Consider a nondiscriminating monopolist. Derive his optimal pricing policy. Show that he serves both classes of consumers if either θ_L or λ is "large enough".

(b) Consider a monopolist who can distinguish the two types (by some characteristics) but can only charge a single price p_i to each type θ_i. Characterize his optimal prices.

(c) Suppose the monopolist cannot distinguish the types. Derive the optimal two-part tariff (a pricing policy consisting of a lump-sum charge F plus a linear price per unit purchased of p) under the assumption that the monopolist serves both types. Interpret. When will the monopolist serve both types?

(d) Compute the fully optimal nonlinear tariff. How do the quantities purchased by the two types compare with the levels in (a) to (c)?

Exercise 3 (**MGW 14.C.8**)**.** Air Shangri-la is the only airline allowed to fly between the islands of Shangri-la and Nirvana. There are two types of passengers, tourists and business. Business travellers are willing to pay more than tourists. The airline, however, cannot tell directly whether a ticket purchaser is a tourist or a business traveller. The two types do differ, though, in how much they are willing to pay to avoid having to purchase their tickets in advance. (Passengers do not like to commit themselves in advance to travelling at a particular time.) More

specifically, the utility levels of each of the two types net of the price of the ticket, P, for any given amount of time W prior to the flight that the ticket is purchased are given by:

$$\text{Business:} v - \theta_B P - W,$$
$$\text{Tourist:} v - \theta_T P - W,$$

where $0 < \theta_B < \theta_T$. (Note that for any given level of W, the business traveller is willing to pay more for his ticket. Also, the business traveller is willing to pay more for any given reduction in W.)

The proportion of travellers who are tourists is λ. Assume that the cost of transporting a passenger is c.

Assume in (a) to (d) that Air Shangri-la wants to carry both types of passengers.

(a) Draw the indifference curves of the two types in (P, W)-space. Draw the airlines isoprofit curves. Now formulate the optimal (profit-maximizing) price discrimination problem mathematically that Air Shangri-la would want to solve. [Hint: Impose nonnegativity of prices as a constraint since, if it charged a negative price, it would sell an infinite number of tickets at this price.]

(b) Show that in the optimal solution, tourists are indifferent between buying a ticket and not going at all.

(c) Show that in the optimal solution, business travellers never buy their ticket prior to the flight and are just indifferent between doing this and buying when tourists buy.

(d) Describe fully the optimal price discrimination scheme under the assumption that they sell to both types. How does it depend on the underlying parameters λ, θ_B, θ_T, and c?

(e) Under what circumstances will Air Shangri-la choose to serve only business travellers?