Empirical Industrial Organization

CY Cergy Paris Université
Master in economic analysis and PhD, Economics track.
Problem Set 1
Due: January 28, 2025

Problem 1

A monopoly mobile phone company faces demand from two types of consumers, 1,2. Type i consumer has surplus $U_i = \ln(1 + \theta_i q) - T$, where q is the service quantity and T is the price paid by the user. Assume that $0 < \theta_1 < \theta_2$. A consumer who does not purchase a plan has zero surplus.

The phone company may provide any positive quantity level q at cost cq, where $c \in (0, \theta_1)$. It may price discriminate by proposing to the consumer different tariff options involving a quantity level q and a price T but cannot prevent personal arbitrage.

1. Characterize by means of first order conditions the first-best solution that would be implemented by the company if it could perfectly price discriminate.

2. Write the optimization problem that the phone company solves in order to derive the optimal price discrimination scheme subject to personal arbitrage.

3. Derive the optimal pricing scheme. (Hint: beware that it may involve not serving one type of consumer.)

4. Provide a graphical illustration of the optimal solution. Explain and provide some intuition.

   Assume next that there is a continuum of consumer types $\theta \in [\underline{\theta}, \bar{\theta}]$.

5. Show that incentive compatibility constraints imply that q is increasing in θ (Hint: use the proof technique that is used to show that a monopoly firm with a larger marginal cost produces a lower quantity).