14.271   Glenn Ellison
Fall 2013

Problem Set #1

Due September 11, 2013

1. Tirole exercise 2.2, page 104.

2. Consider a two-period durable good model. There is a continuum of consumers of unit mass with types $\theta \sim U[0,1]$. In the first period, the monopolist is able to produce a durable good of quality s_1 at cost c. In the second period there is technological progress, so the monopolist can produce a good of quality $s_2 > s_1$ at cost c. A type θ consumer gets utility $s\theta - p$ in any period in which she consumes a good of quality s and pays p. Suppose that an efficient resale market exists at $t = 2$ so that high θ consumers can resell their used goods to lower θ consumers if they want to purchase a new good.

(a) What prices will the monopolist need to charge in equilibrium in the two periods if he wants to sell q_1 units at $t = 1$ and q_2 units at $t = 2$? What will be the price in the resale market for used goods in this case?

(b) Write down the monopolists' maximization problem and solve for the optimal pricing policy for a monopolist with commitment power assuming that the parameters are such that the monopolist wants to make sales in both periods. What conditions on s_1, s_2, and c are necessary for the solution you've found to be the true solution to the profit-maximization problem? How does this fit with what we saw about the solution to the durable goods problem in class?

3. Tirole exercise 1.8, page 83.

4. Read at least the introduction and initial model description in Bergemann and Valimaki's 2006 *JPE* paper "Dynamic Pricing of New Experience Goods." Think about the paper in relation to Shapiro's 1983 *Bell Journal* paper "Optimal Pricing of Experience Goods." What shortcomings of Shapiro's paper do Bergemann and Valimaki try to address in their model? To what extent do their results reflect the main intuitions of Shapiro's analysis of what happens with "pessimistic" and "optimistic" beliefs? In what ways have they made special assumptions or taken steps backward from Shapiro's model in order to keep their analysis tractable?

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