

Written Exam for the M.Sc. in Economics 2012-II

Advanced Industrial Organization

Final Exam
(Re-exam)

August, 2012

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by “eksamen på dansk” in brackets, you must write your exam paper in Danish.

If you are in doubt about which title you registered for, please see the print of your exam registration from the students’ self-service system.

ALL QUESTIONS BELOW SHOULD BE ANSWERED

Problem 1.

1. Consider a Hotelling market with consumers uniformly distributed on the interval $[0,1]$. Consumer x 's location is x .

Two firms have entered the market, A and B , they have located at the end points of the line. Firm A in 0 and firm B in 1. Both firms have constant marginal costs, which are normalized to 0. The firms choose prices and are profit maximizing.

A consumer is interested in at most one unit of the (differentiated) good. Consumer x 's utility if she buys at the price p_A from firm A is

$$v - p_A - tx$$

and similarly it is

$$v - p_B - t(1 - x)$$

if she buys at the price p_B from firm B . In this exercise, you shall just assume that the consumers' valuation of the good always is sufficiently high so that all consumers buy the good in equilibrium.

a. Find the symmetric equilibrium price.

b. Suppose that the firms cannot see the exact location of a consumer but they are able to identify which half of the line a consumer belongs to, i.e. whether $x \leq \frac{1}{2}$ or $x > \frac{1}{2}$. This enables them to price discriminate among the two groups of consumers (those with $x \leq \frac{1}{2}$ and those with $x > \frac{1}{2}$). Find the symmetric equilibrium with price discrimination. Is price discrimination good or bad for (all/some) consumers, is it beneficial for the firms? Does it affect welfare (comparing with the outcome in a)?

c. Now suppose that firm A is able to distinguish whether consumers are located to the left ($x \leq \frac{1}{2}$) or the right ($x > \frac{1}{2}$) but firm B is not.

Find the equilibrium prices in this asymmetric case and the profits to the firms. When doing this just assume that both firms in the equilibrium will sell on both turfs.

d. Now suppose that the firms are ignorant about consumers' locations, just like in subquestion a. above. However, they both individually have the option of making an investment in a market survey, which will enable them to identify whether a consumer is located to the left ($x \leq \frac{1}{2}$) or to the right ($x > \frac{1}{2}$) and thus enable them to price discriminate between the two groups.

Set up the investment game, i.e. the two by two game, where each firm can invest and not invest and use the profits you derived above as payoffs for the different cases.

e. Find the pure strategy Nash equilibrium/equilibria to the investment game. Comment on the result.

f. The tricky one. Suppose that firm A can make a decision on whether to invest or not before firm B and that A can communicate its decision to B . Which decision will A then take, and how will B react to that?

Exercise 2: Consider a Cournot oligopoly with two firms, $i = 1, 2$, producing a homogenous good. We call their quantities q_1 and q_2 , respectively. They are facing the inverse demand curve $P = 1 - Q$ where P is the price and $Q = q_1 + q_2$ is the total quantity sold. Both firms invest in R&D. Firm i chooses a reduction x_i in its marginal cost, which costs $\frac{1}{2} x_i^2$. The marginal cost of firm i becomes $\frac{1}{2} - x_i$.

- (i) Find the subgame perfect Nash equilibrium of the game where the firms first choose R&D expenditures non-cooperatively and subsequently compete à la Cournot in the market for the produced good.

Suppose now that the firms have the option of forming a research joint venture (RJV). The RJV does not allow the firms to coordinate their R&D investments. However, forming a RJV allows the firms to share the results of their R&D investments. In particular, the marginal costs of production for the firms are $\frac{1}{2} - x_i - x_j$. A firm thus benefits equally from a R&D investment made by itself and by its competitor.

- (ii) Find the subgame perfect Nash equilibrium of the subgame where the firms form a RJV, choose R&D expenditures non-cooperatively (knowing that the R&D results are shared afterwards), and subsequently compete à la Cournot in the market for the produced good.
- (iii) Do the firms form a RJV in equilibrium? Is a RJV advantageous to the consumers? Is it welfare improving?

Exercise 3: In June of 2010 Illinois Attorney General Lisa Madigan opened an antitrust investigation of the popular Chicago music festival. The basis for this investigation is the exclusivity clause which artists playing the festival must sign, restricting them from playing any public or private concerts within 300 miles of the festival for 180 days prior to and 90 days past the summer event. There exists the rumor that Roskilde Festival, the largest music festival in Northern Europe, also asks the major bands to sign a similar exclusivity clause.

Suppose that you were asked to assist the Danish Competition Policy Authority in its investigation of the use of exclusivity clauses by the Roskilde Festival:

- (i) Discuss whether there is a market for music festivals or whether there is a broader market for concerts.
- (ii) Discuss whether exclusivity clauses can have anti-competitive effects in this market.