



International Master of Science in Business Administration

*Economics of Business and Markets*

## Problem Set 2

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### Exercise 1

Consider that the store Teachers4Life has settled in Lisbon. Its target market are professors interested in economic issues and it is currently intending to sell 3 products: a 1-year subscription of the magazine “The Economist” (X), a 2-days trip to the Portuguese Ministry of Economy and Innovation (Y) and a crash course about “Bundling” (Z).

For its opening day, the store has sent exclusive invitations to 6 VIPs (Very Important Professors) of the faculty FCEE. With the support of a Teaching Assistant (TA), the company was able to estimate the reservation prices of these VIPs, divided into three different types (3 professors of type A, 1 of type B and 2 of type C):

		Reservation prices in €		
Type	Number of VIPs	X	Y	Z
A	3	70	50	40
B	1	80	40	30
C	2	90	60	50

The firm also knows that each consumer is willing to buy at most one of each product on the opening day.

Knowing that the store buys each of these products at a constant price of 10€, **compute the profits** of the store Teachers4Life for each of the following situations (identify in each case the types of consumers that are going to buy the product(s)):

- If the store can only apply individual prices to its products.
- If the store starts selling its products in a bundle of three units, with 1 unit of X, 1 unit of Y and 1 unit of Z.

- c) In order to increase the profits, the TA who prepared the table above suggested offering a mixed bundling price scheme, with individual prices and a price for a bundle. But instead of a bundle with 3 units ( X, Y and Z), it should make the bundle with just 2 units ( X and Y).

Is the profit higher than in b)? Justify quantitatively.

(Final Exam 2009/2010)

### Exercise 2

Consider a market with two firms. The two firms compete in quantities and can decide whether they will produce the cooperative level of output ( $Q_C$ ) or the non-cooperative level ( $Q_{NC}$ ). The payoffs of these choices are given in the following table:

		Firm 2	
		$Q_C$	$Q_{NC}$
Firm 1	$Q_C$	7 ; 6	1 ; 10
	$Q_{NC}$	8 ; 2	3 ; 4

- a) Which is the Nash equilibrium of this game, assuming that it is played only once? Explain if this Nash equilibrium corresponds to the collusive equilibrium. Justify.

Assume now that the game is repeated an infinite number of periods. In each period  $t$  both firms observe the last period rival's production and each firm chooses the production level.

- b) Define a *trigger strategy* on quantities that will lead to the collusive equilibrium ( $Q_C, Q_C$ ) in each period. For which discount rate  $i$  [discount factor] is this *trigger strategy* a Nash equilibrium of this non-cooperative repeated game? (Remember that  $\delta = 1/(1+i)$  is the discount factor).

(Final Exam 2009/2010)

### Exercise 3

Consider the elasticities reported in the table below. The easiest way to think about the advertising elasticities is the following: Total demand consists of demand today and tomorrow. The short-run elasticity is the effect that advertising today has on demand today whereas the long-run elasticity is the effect that advertising today has on demand tomorrow. In which industries do you expect advertising intensity to be high? Distinguish between short run and long run.

	Income elasticity	Price elasticity	Short-run advertising elasticity	Long-run advertising elasticity
Bakery products	<b>0.7</b>	<b>0.3</b>	<b>0.2</b>	<b>0.3</b>
Books	<b>2.2</b>	<b>0.8</b>	<b>0.3</b>	<b>0.4</b>
Drugs	<b>0.7</b>	<b>1.1</b>	<b>0.7</b>	<b>1.0</b>
Tobacco products	<b>0.0</b>	<b>1.8</b>	<b>0.4</b>	<b>0.6</b>

#### **Exercise 4**

A. An incumbent firm is considering expanding its capacity. It can do so in one of two ways. It can purchase general-purpose equipment and machinery that can be resold at close to its original value. Or it can invest in highly specialized machinery which, once it is put in place, has virtually no salvage value. Assuming that each choice results in the same production costs once installed, under which choice is the incumbent likely to encounter a greater likelihood of entry? Why?

B. *In less than one year after the deregulation of the German telecommunications market at the start of 1998, domestic long-distance rates have fallen by more than 70%. Deutsche Telekom, the former monopolist, accompanied some of these rate drops by increases in monthly fees and local calls. MobilCom, one of the main competitors, fears it may be unable to match the price reductions. Following the announcement of a price reduction by Deutsche Telekom at the end of 1998, shares of MobilCom fell by 7%. Two other competitors, O.tel.o and Mannesmann Arcor, said they would match the price cuts. VIAG Interkom, however, accused Telekom of "competition-distorting behavior," claiming the company is exploiting its (still remaining) monopoly power in the local market to subsidize its long-distance business.*

Is this a case of predatory pricing? Present arguments in favor of, and against, such assertion.

1. Do you think that advertising is a barrier to entry? Explain your answer and give some examples that sustain your opinion. Find at least one example against that does not sustain your argument.

### Exercise 5

- A. A food cooperative sells a homogeneous good called groceries, with the quantity sold denoted by  $g$ . The co-op's cost function is described by  $C(g) = F + cg$ , where  $F$  denotes fixed cost and  $c$  is the constant per unit variable cost. At a meeting of the co-op board, a young economist proposes the following marketing strategy for the co-op: Set a fixed membership fee,  $M$ , and a price per unit for groceries,  $p_M$ , that members pay. In addition, set a price per unit for groceries,  $p_N$ , higher than  $p_M$  at which the co-op will sell groceries to nonmembers.
- What must be true about the demand of different customers for this strategy to work?
  - What kind of price discrimination does this strategy employ?
- B. Deuce Hardware Stores are running the following promotion scheme. Anyone who buys \$50 or more worth of goods and pays for these commodities in cash, obtains a 20 percent rebate. However, the rebate is to be not given as cash but, instead, is paid out with "Deuce money". This is comprised of coupons with dollar values indicating the value at which the coupons may be used to purchase goods at a Deuce store at a later date. What kind of price discrimination do you think this scheme employs?

### Exercise 6

- A. Suppose you hear the CEO of a small firm complaining about the difficulties he faced as he tried to enter a market that has a strong incumbent firm: "as soon as we started to market our product, our rival would basically give away his stuff for free! He did everything to try and drive us out of the market. It was so unfair! We never had a real chance to make it... A firm should not be allowed to do a thing like that. I think the government should pass a law that prohibits to price below cost..." Discuss this proposal. Do you agree?
- B. To get a clear picture of the situation, you decide to confront the incumbent's CEO with the smaller firm's allegations and ask for their point of view. Here is what they tell you: "come on, this is ridiculous! These guys were just not competitive enough... Their product was junk, and their pricing was beyond the beyonds! Do you want to blame us for having the better product and better prices? Let's face it: The marketplace is like the Olympics – it's always the best guy who will win!" Discuss this statement.

### **Exercise 7**

Suppose that a company Lixivez is a monopolist that faces a market demand represented by  $Q=200-2P$ , where  $Q$  is the number of units sold and  $P$  is the unit price. The marginal cost is constant and equal to 10 euros.

- a) Which price should Lixivez charge? What is the profit level for Lixivez?
- b) Lixivez is considering the possibility of adopting a quantity discount policy. You were hired as a consultant and you must indicate the optimal discount policy for Lixivez. Furthermore you must also show that your recommendation is profit improving.