

Economics of Business and Markets MSc in Business Administration

2009–10
April-May 2010

Fernando Branco
FCEE - Católica Office 5325

Final Exam (June 14, 2010)

1. You may access a **two-pages A4 sheet** with personal notes.
2. **Questions 1 and 2** are mandatory.
3. Answer **two of questions 3-5**. Each values 25 points.
4. You have **2:00 hours** for solving the exam.
5. Be as **complete and clear** as possible.
6. **Good luck.**

1. (**35 points**) Your company is just considering to launch a new product. While you will be the sole provider in the first year, a competitor will be able to enter in the second year, and in two years the product will be obsolete.

a) In the discussion to decide the price for the first year, there were references to *accommodated*, *deterred* and *blocked* entry. Explain each of the concepts.

Solution: *Blocked* entry refers to a situation in which a potential entrant prefers not to enter, even if the incumbent does not deviate from its monopoly action; *accommodated* entry refers to a situation in which by keeping the monopoly action, the incumbent does nothing to prevent the entry of a potential competitor; *deterred* entry corresponds to the situation in which the incumbent deviates from the monopolistic action, and as a result the potential competitor does not enter.

b) In that discussion, one of your colleagues suggested that the focus should be on maximizing first year profit, while another recommended a lower initial price to deter entry, so that profit will come in the second year. On which side are you? (*Do not forget to consider elements such as sunk entry costs, the nature of competition in the second year (price or quantity), simultaneous or sequential decisions in your discussion*).

Solution: The focus should be first year profit if second year profits do not depend on first year actions. However, this may not be so if entry is deterred (for example, if sunk entry costs are intermediately high, if second period competition is in quantities and we take the role of leader), or even if entry is accommodated (for example, if a first year action may reduce consumer switching in the second period).

c) Determine the best pricing policy in the following case:

- The market demand in the first year is $Q = 12000 - 1000p$;
- If there is entry in the second year, all customers that have bought from you in the first year will remain loyal, as long as your price does not exceed their willingness to pay; but, all other customers will buy from the lowest price provider;
- Price discrimination is not possible;
- For all providers the marginal cost is constant and equal to 6;
- Your competitor will face a sunk cost of entry equal to f .

Solution: If I was alone in the market, I would like to charge the price of 9, having an annual profit of 9000. If the other firm enters, I will not want to compete for the other customers. Therefore, there is no incentive to charge a different price in the first period. As a result the other firm's decision to enter or not enter will just depend on f .

2. (15 points) The Coca-Cola Company is a worldwide producer of beverages. It offers a portfolio of more than 3300 products, sold in more than 200 countries. Two of its top beverages are Coke and Sprite. But, while in most countries Coke has consistently been a leader in its market segment (with Pepsi being a clear second), Sprite is often not the leader in its segment (outsold by Sierra Mist, 7Up, or local brands). With this information as reference, comment on the economic rationale of exclusivity deals that force restaurants that want to offer Coca-Cola drinks to just offer Coca-Cola drinks.

Solution: Exclusivity deals might help Coca Cola to protect the market for Sprite. As Coke is a leader, restaurant owners might be willing to accept the deal, even though the customers that would prefer a Sprite's competitor would not be so happy, they satisfy Coke's customers. It is easier to make this deal with restaurants than with dealers, as customers switching costs are much higher in restaurants.

3. Bundling was one of the price discriminating tools studied in the course.

- a) What is bundling? How does it work to yield price discrimination? What degree of price discrimination does bundling correspond to?

Solution: Bundling is a practice in which a seller offers several products/services together for a price that is below the sum of the independent prices. It may help price discrimination whenever customers' preferences have enough heterogeneity for different customers to prefer different bundles. It is an example of second-degree price discrimination.

- b) Illustrate the use of bundling identifying the best bundling policy in the following example:

- The company provides two different services (A and B), at zero marginal cost;
- There are three segments of customers, with unit demands for each service;
- In segment I , corresponding to 50% of the customers, the valuations are $v_A^I = 10$ and $v_B^I = 8$;
- In segment II , corresponding to 30% of the customers, the valuations are $v_A^{II} = 14$ and $v_B^{II} = 2$;

- In segment *III*, corresponding to 20% of the customers, the valuations are $v_A^{III} = 3$ and $v_B^{III} = 7$.

Solution: Start by noting that it is better to sell the bundle at 16 (*I* and *II* buy it, profit 12.8) than to sell it at 18 (*I* buys it) and *A* at 14 (*II* buys it) (profit 13.2). Also sell *B* at 7 (profit 1.4).

- c) “Resale limits the use of bundling as a discriminating policy.” Comment.

Solution: If resale is possible, some agent might buy the bundle and sell the products/services separately afterwards. This imposes a limitation on bundling as price discrimination device.

4. A competition authority has long been monitoring a duopoly sector. For a long time, the *HHI* had been 0.5, but recently it increased to 5/9.

- a) Describe the basic theory of concentration indices. According to this theory, should the competition authority be concerned with the recent increase in the *HHI* in this sector?

Solution: Concentration indices are measures of asymmetry of market shares. The basic idea is that the more asymmetric market shares are the closer the index is to 1. An increase in the index is therefore taken as a sign of increased market power. As such, the competition authority will in general be worried with the evolution reported.

- b) Show that the evolution of the *HHI* described above is compatible with the following situation:

- The (inverse) demand in this market is described by $p = 40 - 2(q_1 + q_2)$;
- Initially, both firms have constant marginal equal to 16;
- As a result of an innovation, recently, one of the firms has reduced its marginal cost to 10.

Solution: When both firms have marginal cost 16, each firm had a share of 50%, hence $HHI = 0.5$. If one firm reduced the cost to 10, that one would have share 2/3 (quantities $q_1 = 3$ and $q_2 = 6$), hence $HHI = 5/9$.

- c) Considering this example, comment on the limitation of the *HHI* to evaluate competitiveness in innovative sectors.

Solution: Despite leading to a higher *HHI*, the second situation above is economically better than the first one. The example suggests that *HHI* might have specific limitations to evaluate competition in innovative sectors.

5. Consider a market where customers are uniformly located on the line $[0, 1]$. Each customer has a unit demand for the good, but faces a transportation cost. Two firms serve the entire market, with constant marginal cost. Identify firms' equilibrium choices when transportation costs are linear and quadratic.

Solution: I assume that firms have marginal cost c , and v is such that the entire market is covered, for sure.

Consider first the case of linear transportation costs. Suppose that firm 1 is located in $l < 0.5$ and firm 2 is located in 0.5. Firms will select prices $p_1 = (5 + 6c + 2l)/6$ and $p_2 = (7 + 6c - 2l)/6$

and firm 1's profit will be $\pi_1 = (5 + 2l)^2/72$. As firm 1's profit increases as l increases, firm 1 will prefer to locate next to firm 2. Hence, there is an incentive for minimum differentiation (although in the limit, they will have to play mixed strategies).

Consider now the case of quadratic marginal costs. Suppose that firm 1 is located on 0 and firm 2 is located on l . Firms will select the prices $p_1 = \dots$ and $p_2 = \dots$. The profit of firm 2 will be $\pi_2 = l(4 - l)^2/18$, which increases as $l \rightarrow 1$. Hence, there will be maximum differentiation.