

Problem Set B Regulation and Antitrust

Note: You can earn up to 25 points. Points for a problem are only awarded for (almost) completely correct solutions to a problem.

Problem 1 (Double marginalization, 4 points)

Problem Set C Problem 2

Consider a market with a single manufacturer M that sells its product via two retailers. The manufacturer does not incur any costs.

There are two retailers, R_1 and R_2 that face no cost of distribution. Retailers compete in quantities. Inverse demand is given by $p = 12 - Q$, where $Q = q_1 + q_2$ is the total quantity offered by both retailers.

The manufacturer offers contracts on a take it or leave it basis to the two retailers. Retailers observe the contracts signed by all retailers before retailers simultaneously chooses their quantities.

- Suppose U offers the same per-unit wholesale price w to both retailers. What is the resulting market price depending on w ?
- What is the optimal choice of w for the manufacturer. Is there a problem of double marginalization?

Problem 2 (Channel coordination (10 Points))

There is a monopoly manufacturer of sporty sneakers who sells through two different channels. The local channel is a brick and mortar retailer that has a monopoly. The online channel is served by two retailers that compete in prices. Assume that the two channels are online and local are completely separated such that there is no competition between channels. The two online retailers are perceived as homogeneous by consumers. Demand for sneakers is given by $q = 1 - p$ in each of the channels. For the online channel p is the lowest price offered by the two online stores, while locally, it is the price offered by the local retailer.

Assume that there are no costs of production or retailing.

The manufacturer offers two-part tariffs that consist of a fixed fee F and a per-unit wholesale price w . Suppose that the manufacturer offers take it or leave it contracts and that retailers value their outside option to the contract at zero.

- Assume first that the manufacturer and all the retailers are integrated such that they maximize the joint profits. What are the optimal prices in each channel for the industry.
- Suppose from now on that each firm maximizes its own profits. What is an optimal two-part tariff that the manufacturer offers to an online retailer. Verify that the resulting retail prices is the same as in the integrated solution you have just calculated.

- c) Find an optimal two-part tariff that the manufacturer offers to the local retailer.
- d) Suppose the manufacturer is not allowed to offer two different wholesale prices to online and local retailers. Find the optimal two-part tariffs of the manufacturer under the constraint that the wholesale price has to be identical for each retailer. What are the resulting market prices. Compare the outcome to the case of differentiated two-part tariffs, who profits, who is harmed?
- e) Discuss verbally, whether the manufacturer would like to use RPM if he cannot offer different wholesale price for the two different channels.

Problem 3 (vertical restraints and advertising, 4 points)

An upstream manufacturer whose marginal cost is $c = 6$ sells his product to two retailers who are Cournot competitors. First, retailers simultaneously and independently decide whether or not to launch an ad campaign. If at least one retailer pays for the ad campaign, market demand is high:

$$p = A_H - Q,$$

where $A_H = 24$. If neither one launches the ad campaign, demand is low

$$p = A_L - Q$$

where $A_L = 15$. The ad campaign costs $S = 28$. Next, given the high or low demand, retailers play a Cournot quantity game. Assume that each retailer gets the product from the manufacturer for the price $w = c = 6$ and pays a flat franchise fee equal to F_i , $i = 1, 2$. That is, the manufacturer can in principle impose different franchise contracts on the retailers.

- a) What are the retailers' equilibrium profits if both pay S , if one of them pays S and if neither of them pays S ? Is the ad campaign launched in the Nash equilibrium? In equilibrium, what is the maximum total franchise fee that the manufacturer can extract?
- b) Suppose the manufacturer cannot launch the ad campaign himself and cannot force the retailers to pay for it. However, the manufacturer can impose a resale price maintenance agreement on each retailer, saying that they are to sell the good for the price equal to $p = 15$. In this case, each retailer will have half of the market. What are the retailers equilibrium profits if both pay S , if one of them pays S and if neither of them pays S ? Is the ad campaign launched in the Nash equilibrium? In equilibrium, what is the maximum total franchise fee that the manufacturer can extract if it can charge different franchise fees, F_1 and F_2 ? In equilibrium, what is the maximum total franchise fee that the manufacturer can extract if it cannot charge different franchise fees, that is it must be that $F_1 = F_2$?

Problem 4 (entry deterrence, 3 points)

Market demand is given by $p = 12 - Q$. There are two firms: the incumbent firm (I) and the entrant firm (E). Incumbent moves first by choosing quantity q_I from the interval $[0, 4]$. The entrant observes q_I and decides whether or not to enter and how much to produce if he enters (q_E). There is no fixed cost of entry. If the entrant decides to stay out, his profit is zero and the incumbent enjoys a monopoly position. Suppose that both incumbent and entrant have identical marginal costs equal to $c = 8$

- a) What is the subgame perfect equilibrium of this game? What are the quantities produced by the incumbent and entrant? What are their profits?
- b) What is the minimum quantity that must be produced by the incumbent to deter entry (to make entry unprofitable)? In this game, will the incumbent ever try to deter entry by increasing quantity?

Problem 5 (price regulation, 4 points)

There are two potential suppliers $i = 1, 2$ in a market. The cost of production are given by:

$$C(q_i) = q_i + 8.$$

Inverse demand in the market is

$$p(Q) = 10 - Q,$$

with $Q = \sum_i q_i$. If both firms are present in the market, there is Cournot competition.

- a) Derive the equilibrium profits if both firms are active in the market. Is there a natural monopoly?

There is a discussion to found a new regulatory agency.

- b) Suppose that the agency can only regulate the price. What price level should be regulated to maximize total welfare (ideal price regulation) assuming that one firm is active.
- c) What would the welfare optimal regulation of the agency be if it has to ensure that any regulated firm that is supposed to be active in the market makes non-negative profits? Consider that the agency can regulate prices and market access.
- d) How large can the costs of the regulatory agency be such that it is welfare improving to found the agency?