Question 1 – short essays (75 percent weight)

Write about one page on each question.

a) Consider a game where two firms sell perfect substitutes and make sequential moves. I.e., firm 1 first makes a decision, and then firm 2 makes a decision. Explain whether there is a first-mover or second-mover advantage in this game, and whether it depends on the two firms competing in quantities or prices.

When in quantities: There is a first-mover advantage because there is a fixed demand curve and the two firms' goods will sell for the same price. The first-mover can choose to produce a lot, thereby lowering the marginal revenue for the second-mover. The second-mover will respond by choosing to produce less. As the two goods sell for the same price, the first-mover obtains higher profits. This is only possible if the first move involves a credible commitment. After the second firm has made its choice, the first-mover has an incentive to go back on his choice and produce less. If that was possible, however, his initial high-production choice wouldn't be credible and the second-mover wouldn't choose to produce little.
When in prices: There is now a second-mover advantage because with perfect substitutes and unlimited capacities, all consumers flock to the cheapest good. The second-mover can now undercut his opponent and steal the entire market.

A good answer should also discuss to what extent the leader is able to commit to the chosen action.

b) During the course, we have discussed the so-called Hotelling (or linear city) model, in which two firms compete in prices and the goods are horizontally differentiated, which is illustrated by them being located at different points along a line. In this model, our predictions as to whether the firms would end up locating close to, or far from, one another, depended on whether the prices were fixed in advance or something the firms could choose. Explain in your own words the difference between the two cases and what is going on here.

I want them to discuss two opposing effects: Firms both want to locate where the consumers are (the market size effect) and to soften the price competition by separating their product from that of the competition (the competition effect). When prices are fixed, the latter effect is shut down and the firms lump together in the middle of the line in order to attract as many consumers as possible. When firms set prices (after location choices), in our model we found that the firms want to move as far apart from one another as they can (maximal differentiation). That is, the competition effect dominated.

Extra plus if they challenge the model, e.g. by considering other possible transportation costs, or by pointing out that firms wouldn't want to move infinitely far away – at some point it is better to capture more customers at the same price than to raise the price even more.

c) The competition authorities often employ a screening tool called upward pricing pressure (UPP) in order to assess whether such a merger might cause social harm. Technically, we say that there is upward pricing pressure if $e_1 < (p_2 - c_2)DR_{12}$, where e_1 measures the reduction in marginal costs to firm 1 when firm 1 and firm 2 merges, p_2 and c_2 represent the

pre-merger price and marginal cost for firm 2, while DR_{12} represents the diversion ratio from firm 1 to firm 2, i.e. $\frac{\partial q_2}{\partial p_1} / \frac{\partial q_1}{\partial p_1}$, evaluated at the pre-merger levels.

i. Explain why there might be a problem for society if two firms, who are close competitors, merge.

ii. Explain the strengths and weaknesses of the UPP as a merger screening tool.

A problem because after the merger, the merged firms have an incentive to raise the price because they can internalize parts of the competitive externality they exerted on one another pre merger. The problem is most severe if the firms were close competitors (severe pre-merger competitive pressure) and the merger gives rise to few marginal efficiency gains. The UPP measures this, by calculating the initial incentive for the merged firm to unilaterally raise the price following the merger. It compares, on the margin, whether the firm would want to raise the price. Its main strength is that it is easy to compute. Its main weaknesses are that it doesn't capture the multilateral aspects of the post-merger competition (i.e. are there other firms that will respond by raising their price, such that prices spiral further up) and that it is only based on local facts around the pre-merger equilibrium, i.e. it imposes strong assumptions on the demand and cost structure. Because of these weaknesses, one has to use different UPP/GUPPI values when screening mergers in different markets, depending on the circumstances.

d) Netflix recently announced that they will start running ads on their platform. Discuss the tradeoffs Netflix should have considered in making such a decision. What extra possibilities does the digital nature of Netflix' business bring in this regard?

Elements I'm looking for: two-sided market/platform, viewers dislike ads whereas Netflix make money off them, need to balance the two. Extra points for including the film makers here – what are their preferences? Since they're digital, they can price discriminate easily, e.g. with a free tier with ads, and a paid model without, or different combinations of ads and payments

e) These days, the Norwegian ministry of trade and fisheries is deciding how it wants to allocate permits to ocean-based fish farming in Norway. (Thus far, Norway has only had permits for fish farming in the fjords, and ocean-based fish farming without a permit has not allowed and has not been tested.) Explain the pros and cons of using an auction as an allocation mechanism in this case.

Elements I'm looking for: can separate allocation and payment, and in principle achieve efficient allocation. Considerable common values here, thus potential for winner's curse. Should therefore allow buyers to learn from one another (e.g. sequential and open info). The government might care for many other things than price (lice, fish health, etc.), thus a need to either screen buyers before they enter the auction, or to award permits based on more than just the monetary bid.

Question 2 – math (25 percent weight)

Suppose there is a vertical chain with one manufacturer who produces a good at a constant marginal cost c, sells it to a retailer at price w, who in turn resells this to the consumers at a price p. Apart from the manufacturing costs, the manufacturer has no other costs. The retailer has no other costs apart from the wholesale price of the good. Demand is given by $q = a - bp$. Assume throughout that $a = 10, c = 2, b = 1$.

a) What is the socially efficient price at which this good should be sold?
b) Under vertical separation, i.e. when the manufacturer and the retailer set their prices in order to maximize their own profits independently of one another, what do you expect the retail price to be?
c) What price would you expect under vertical integration, i.e. when the manufacturer and the retailer acts as one, and set the retail price in order to maximize joint profits?
d) Explain the difference between your answer to questions a), b) and c).
e) Extend the problem so that the manufacturer offers the retailer a take it or leave it-contract with a two-part tariff, so that in total the retailer pays the manufacturer $F + wq$. With our numerical example values, what is the highest value of F that the retailer will accept? What do you expect the retail price to be if both firms maximize their own profits?

Answers:

a)

$p = c = 2$. At any other price, there will be consumed a socially inefficient amount (i.e. marginal willingness to pay would differ from the marginal production cost).

b)

The retailer solves $\max_p (p - w)(a - bp) \Rightarrow p^{VS} = \frac{a+bw}{2b} \Rightarrow q(w) = a - b\left(\frac{a+bw}{2b}\right) = \frac{a}{2} - \frac{bw}{2}$.

The manufacturer then solves $\max_w (w - c)\left(\frac{a}{2} - \frac{bw}{2}\right) \Rightarrow w^{VS} = \frac{a+bc}{2b}$.

In the numerical example, this means $w^{VS} = \frac{10+2}{2} = 6, p^{VS} = \frac{10+6}{2} = 8$.

c)

The integrated firm solves $\max_p (p - c)(a - bp) \Rightarrow p^{VI} = \frac{a+bc}{2b} = \frac{(10+2)}{2} = 6$.

d)

The answer to a) is the efficient outcome, which only arises under perfect competition. The answer to c) is the one that maximizes the joint profit of the two firms. Here they exploit market power and the price is above a). Under b) the price is even higher because we have a vertical externality between the two firms – the only way for them to make profits is by distorting the per-unit price. Thus both mark up the price and the end result is worse than under c).

e)

The best thing for the manufacturer is to set $w = c = 2$ and set F as high as possible. The retailer will then solve the same problem as in c), and get a profit $\Pi^R = (p - c)(a - bp) = (6 - 2)(10 - 6) = 16$. He will therefore set a price equal to 6 and will be willing to pay up until 16 in a fixed fee to the manufacturer to be allowed to retail his goods.