cover page for a written examination/test

Name of subject: Competition Policy and Regulation

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Lecturers: Jan Boone, Lapo Filistrucchi and Yuxin Yao

Telephone number of departmental secretariat: 31 (0)13 466 2019, 2416

Students are expected to conduct themselves properly during examinations and to obey any instructions given to them by examiners and invigilators. Firm action will be taken in the event that academic fraud is discovered.

Enter your ANR!

Each question should be answered on TU exampaper, each furnished with the candidate's name and ANR number. If candidates are unable or unwilling to answer a question, they must nevertheless submit a sheet of paper containing details of their name and ANR, together with the number of the question concerned. The 6 digit ANR number is printed on the TU card.

- Candidates are allowed to use a calculator, but no books or notes.

- This exam consists of 2 questions.

- Candidates must write clearly.

- Candidates must convince us that they understand the material of this course. Motivate your answers!

- There is no reason to panic! If you feel that you miss relevant information to answer a question, state this explicitly and assume the information that you need. Then we can see whether we can give points for this.

- If you don't write anything, we cannot give you any points!

Question 1 (50 points)

The antitrust authority (AA) of the town of Bolzano[1] is notified a merger between the two biggest producers of apples. The first producer produces only apples of the variety Granny Smith. The second producer produces apples of varieties Golden Delicious and Gala. The two merging parties claim that the merger will not raise concerns of unilateral effects because Granny Smith apples are acidic, while Golden Delicious and Gala are sweet. Hence the two producers should be seen as producing independent or even complementary products. The questions arise of whether Granny Smith, Golden Delicious and Gala a) are substitutes, complements or independent products b) belong to the same relevant market. More generally, the AA needs to decide whether to clear the merger or not.

The AA hires a consultancy which reports the following estimates of residual demands for the three varieties of apples

$$q_{GS} = \alpha + \beta p_{GS} + \gamma p_{GD} + \delta p_G$$

$$q_{GD} = \zeta + \eta p_{GS} + \theta p_{GD} + \iota p_G$$

$$q_G = \kappa + \lambda p_{GS} + \mu p_{GD} + \nu p_G$$

where $\alpha = 100(20); \beta = -2(0.5); \gamma = 1(0.4); \delta = 0.5(1); \zeta = 50(10); \eta = 0.5(0.1); \theta = -3(1); \iota = 2(0.5); \kappa = 200(50); \lambda = 1(1.5); \mu = 2(0.5); \nu = -4(1)$

(in parenthesis are the standard errors of the estimates)

(a) (5 points) Are the 3 products independent, substitutes or complements? Why?

(b) (5 points) Assume the 2 producers compete in prices, they have no fixed costs and their marginal costs are constant and equal respectively to $MC_{GS} = 2; MC_{GD} = 2; MC_G = 1$. Calculate the pre-merger equilibrium prices and quantities (hint: look also at the standard errors).

(c) (5 points) Using the prices and quantities calculated above, substitute the corresponding values in the following matrix of own and cross price elasticities

$$\begin{bmatrix} \epsilon_{GS,GS} & \epsilon_{GS,GD} & \epsilon_{GS,G} \\ \epsilon_{GD,GS} & \epsilon_{GD,GD} & \epsilon_{GD,G} \\ \epsilon_{G,GS} & \epsilon_{G,GD} & \epsilon_{G,G} \end{bmatrix}$$

where $\epsilon_{GS,GD}$ is the elasticity of the demand for Granny Smith with respect to the price of Golden Delicious (and similarly for the other elements of the matrix).

(d) (5 points) Using the prices and quantities calculated above, substitute the corresponding values in the following vector of markups

$$\begin{bmatrix} m_{GS} & m_{GD} & m_G \end{bmatrix}$$

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[1]Bolzano is the capital city of South Tyrol, the most important apple cultivation area in all of Europe (Trentino-South Tyrol covers 70% of apple production in Italy and 15% of the production in Europe). Clearly there is no AA of Bolzano. There is however an Italian AA that might investigate a merger in the market considered here.

(e) (5 points) Explain (in one paragraph) the procedure and the rationale behind the SSNIP test.

(f) (5 points) Perform the SSNIP test by Critical Loss Analysis: do the 3 products belong to the same relevant market?

(g) (5 points) Give a definition/explanation of what are i) unilateral (or non-coordinated) effects of a merger and ii) coordinated (or pro-collusive) effects of a merger (3 lines for each definition).

(h) (5 points) Using the estimates above, calculate the following diversion ratios

$$D_{GS,GD}, D_{GS,G}, D_{GD,GS}, D_{GD,G}, D_{G,GS}, D_{G,GD}$$

where $D_{GS,GD}$ is the percentage of sales of Golden Delicious which is diverted to Granny Smith when the price of Golden Delicious increases (and similarly for the others).

(i) (5 points) Calculate Upward Pricing Pressure (UPP) for the price of Golden Delicious, Granny Smith and Gala apples allowing for an efficiency credit of 5%. Should this merger be investigated based on UPP analysis? Would the conclusion change if you allowed for an efficiency credit of 10%?

(j) (5 points) Assume that if the merger is cleared there will be efficiency gains such that post-merger $MC_{GS} = 1; MC_{GD} = 1; MC_G = 1$. Calculate the post-merger equilibrium prices and quantities. According to your merger simulation, would the merger raise concerns of unilateral effects? If you were the AA would you allow the merger? Why?

Question 2 (50 points)

Consider two upstream health care providers P_1, P_2 and one downstream insurer I. The providers –simultaneously and independently– make take-it-or-leave-it offers to I. We are interested in whether I contracts with both providers (we call this the common outcome) or only one of them (exclusive outcome).

Each provider can treat a patient at cost c normalized to 0. Providers have no fixed costs. If a patient has no insurance, her outside option equals 0. The insurer charges a premium σ. In the exclusive outcome, a patient with insurance can go to the contracted provider only. Demand for insurance with only one contracted provider is given by $1 - \sigma$ (independent of whether P_1 or P_2 is contracted). Demand for insurance with both providers contracted is given by $1.2 - \sigma$. In this case, the patient has a choice of a provider which she values. For each patient there is a probability $1/2$ that she will visit P_1 if she has the choice between the two providers.

To simplify notation, we assume that someone with insurance needs one treatment (with probability 1) next period.

I announces that it wants to contract both providers (common outcome). Each provider bids a price per treatment p_i (linear pricing).

(a) (5 points) Explain why I chooses σ to solve

$$\max_{\sigma}(1.2 - \sigma)(\sigma - \tfrac{1}{2}(p_1 + p_2))$$

(b) (2 points) Show that $\sigma = 0.6 + \tfrac{1}{4}(p_1 + p_2)$.

(c) (3 points) Explain why P_i chooses p_i to solve

$$\max_{p_i} \tfrac{1}{2}p_i(0.6 - \tfrac{1}{4}(p_i + p_j))$$

with $i, j = 1, 2$ and $i \neq j$.

(d) (5 points) Show that in symmetric equilibrium $p_1 = p_2 = 0.8$.

(e) (5 points) Draw the demand curve $1.2 - \sigma$, indicate the σ charged by I. Show that consumer surplus (CS) in the common outcome is given by $CS^C = 0.02$.

Now I announces that it will accept the contract of one provider only (exclusive outcome).

(f) (3 points) Argue why providers set $p_1 = p_2 = 0$ when competing with linear contracts.

(g) (2 points) Show that I sets σ to solve

$$\max_{\sigma} \sigma(1 - \sigma)$$

(h) (5 points) Draw the demand curve as in (e) but now for the exclusive outcome. Indicate CS in the figure and show that $CS^E = 1/8 = 0.125$.

(i) (1 point) The excluded provider goes to the competition authority to complain about the outcome. He insists that the competition authority should enforce the common outcome in linear contracts because consumers prefer provider choice. Argue why the competition authority should (or should not) enforce the common outcome.

Suppose that providers use two-part tariffs instead of linear contracts. That is, each provider i offers a fixed fee t_i and a price per treatment p_i.

(j) (2 points) Argue that with two-part tariffs, in the exclusive outcome we find $CS^E = 0.125$.

(k) (3 points) Explain why in the common outcome with two-part tariffs, each provider offers $p_i = 0$.

(l) (5 points) Show that with two-part tariffs we have in the common outcome $CS^C = 0.18$.

(m) (9 points) Compare $CS^E - CS^C$ in the case with linear pricing and with two-part tariffs. Explain why the sign of $CS^E - CS^C$ differs between the two cases. Give 3 reasons (or externalities) for this.