

EXERCISE 1 – QUESTIONS ABOUT THE LECTURES

Briefly answer both questions (no more than 10 lines per question):

- 1 – Explain the concept of yardstick competition. How does it help the regulator deal with informational asymmetries about costs?
- 2 – Generally speaking, what is an informational rent? In the Laffont-Tirole (1986) model seen in class, how is this informational rent determined? Explain the following sentence: “The optimal level of effort required by the regulator to the high-cost firm is not the first-best one, because of the size of the informational rent the regulator would have to give to the low-cost firm.”

EXERCISE 2 – ABOUT EXTERNALITIES

An airport is situated close to a residential building, called “le Domaine des Dieux” and managed by a private firm. We denote by x the number of overflights and by y the number of flats inside the residential building. The profit of the firm owning the airport and the profit of the firm owning the private residential building are respectively:

$$\begin{cases} \pi_A = 24x - x^2 \\ \pi_B = 18y - y^2 - xy \end{cases}$$

- 1 – Suppose first that the airport and the building are owned by one single society. Determine the levels x^* and y^* which maximize the profit of this society.
- 2 – Suppose then that the airport and the building are owned by two different companies, each of them maximizing their profit. Determine x^e and y^e . Compare with the levels found in the previous question and explain.
- 3 – Show that the solution (x^*, y^*) can be obtained by two independent companies if you impose a tax t on each overflight. Find the accurate level of t and comment.
- 4 – (Bonus question) Show that the same result can be obtained if the company owning the residential building gives a subsidy S , with expression $S = (x^e - x)s$ to the airport. Saying it differently, the company owning the private building pays the airport so as to make it reduce overflights below x^e . Determine the appropriate level of s .