Exercices

20/02/2025

3:00 - 4:00

EPFL

I. Economic analysis

Questions for discussion:
The economist's point of view (1/2)

1. Speed limit on roads: Should one reduce speed from 90 km/h to 80 km/h the speed limit on "départementales"?

2. Use a « Carbon tax »? What would be the way to determine its optimal price?

3. Is it better to store nuclear waste in deep geological storage (500m underground) or use surface storage?

4. equitable and efficient Location of a school shared by 3 cities (triangle). What are the tradeoffs?

   Optional hint for students who enjoy math. : Perpendicular of the bisector of the segments vs Fermat-Torricelli's point

Questions for discussion: The economist's point of view (2/2)

Class Activity Plan (18 minutes)

1. Divide students into 4 groups, one group per question (1 min)

2. Summarize the question (1 min)

3. Discuss economic tradeoffs (2 min)

4. Identify pros and cons using a structured method (2 min)

5. Each group presents their case study on the board (2 min × 4 groups)

After 6 minutes the first group starts

One minute for teacher's comments

II. Hotelling model (1929)

Hotelling, H. (1929). *Stability in Competition.* The Economic Journal, **39**(153), 41–57. https://doi.org/10.2307/2224214

Location and price equilibria: linear space

- 2 Firms on the segment [0,1], location at x_1 et x_2

- Uniform distribution of consumers; each buys one unit of the good

- Utility of the consumer at x who buys from i: $U(x,i) = A - p_i - t|x-x_i|$, i=1,2, p_i =price of Firm i, A constant (to be interpreted); t = linear transport cost

Q1 Equal prices (=1) : which locations 2 firms choose?

Q2 Equal prices (=1): which locations 3 firms choose? And 4 firms?

- 2 firms: x_1 = 0.20 et x_2 = 0.80 fixed. Assume each firm maximizes his profit (Bertrand; i.e. taking as fixed competitor's price, and fixed location).

Q3 Display market area, for linear costs transportation costs.

Q4 Intuitively where firms locate?

Q5 Optimal (efficient) locations for 2 firms for linear fixed prices: intuition & solution

III. Perfect competition

Perfect competition (difficult)
Started in class to finish alone

$TC(y) = y^{0.5} + y^{1.5}$: Total production Cost

$D(p) = 1600 / p^2$: Market Demand.

N Firms : fixed in short term, variable in the long run.

Q1 Compute and graph marginal cost MC(y), and average costs, AC(y).

Q2 What are supply & equilibrium price in the short run (N = 100)?

(Hint: Profit should be positive).

Q3 What are equilibrium price and N in the long-run ?

(Hint: Free entry imposes zero profit).