Kvantifikace dopadů mergers

Oligopoly

Vězňovo dilema

		B	
		talk	silent
A	talk	A = 2, B = 2	A = 0, B = 5
	silent	A = 5, B = 0	A = 1, B = 1

		Coca-cola	
		advertise	not-advertise
Pepsi	advertise	P = 3, C = 3	P = 13, C = -2
	not-advertise	P = -2, C = 13	P = 8, C = 8

Cournout oligopoly

Cournout oligopoly

- Homogenous good
- Competing in quantities
- Preferences -> biggest profit
- Evaluating Cournout:
  1. Estimate residual demand
  2. Estimate marginal revenue *given the other firm`s quantity*
  3. Firm 1: *marginal revenue = marginal costs*
  4. Firm 2: *marginal revenue = marginal costs*
  5. Solve

Cournout oligopoly: merger control

- Hypothethical example: *Two symmetric firms in the same market want to merge:*
  - *Inverse demand:* $P = a - b * Q$
  - *Residual demand:* $P = a - b * (q_1 + q_2)$
  - *Marginal costs of 1 firm:* mc_1
  - *Total revenue of 1 firm:* $TR = [a - b * (q_1 + q_2)] * q_1$
  - *Marginal costs of 2 firm:* mc_2
  - *Total revenue of 2 firm:* $TR = [a - b * (q_1 + q_2)] * q_2$
- Symmetry implies:
  - $Q = N * q_i$
  - $mc_i = mc_j$

Cournout oligopoly: pre-merger

$$q_1 = \frac{a - bq_2 - \mathrm{mc}_1}{2b} \quad \text{and} \quad q_2 = \frac{a - bq_1 - \mathrm{mc}_2}{2b}.$$

Solving these two equations would give us Cournot–Nash equilibrium quantities,

$$q_i = \frac{a + \mathrm{mc}_j - 2\mathrm{mc}_i}{3b}.$$

Summing across firms we can calculate the total industry output:

$$Q = \frac{2a - \mathrm{mc}_1 - \mathrm{mc}_2}{3b}.$$

And substituting total output into the inverse demand function implies that the market price will be

$$P = \frac{a + \mathrm{mc}_1 + \mathrm{mc}_2}{3}.$$

Cournout oligopoly: post-merger

$$\max_{q_1,q_2}(P(q_1+q_2)-\mathrm{mc}_1)(q_1+q_2)=\max_{Q}(P(Q)-\mathrm{mc}_1)Q,$$

where the equality follows since the former optimization program only depends on the total output, $Q = q_1 + q_2$. The first-order condition for profit maximization is

$$P(Q)+P'(Q)Q=\mathrm{mc}_1.$$

Replacing the demand function and its derivative, we obtain the optimal monopoly quantity which will also depend on the demand parameters and the firm's costs

$$a-bQ-bQ=\mathrm{mc}_1$$

so that post-merger market output is

$$Q=\frac{a-\mathrm{mc}_1}{2b}\quad\text{and}\quad P=\frac{a+\mathrm{mc}_1}{2}.$$

Cournout oligopoly: reaction functions

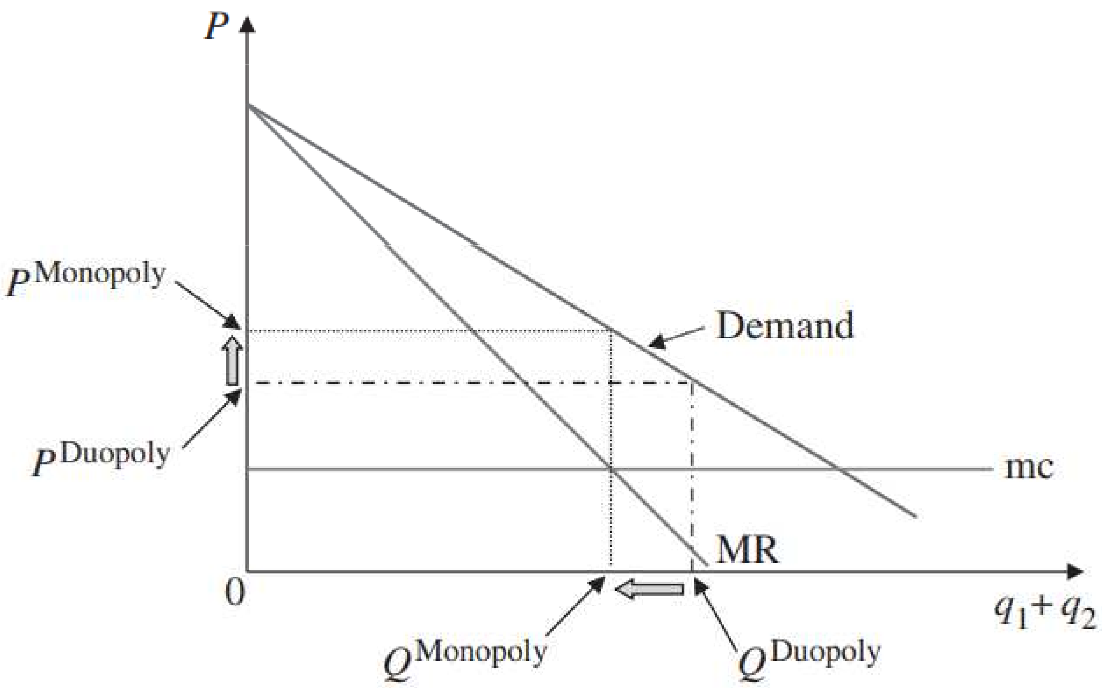
The reaction functions of firms in a market with N symmetric firms are

$$q_i = \frac{a - \text{mc}}{b(N + 1)}$$

and the market price will be

$$P = \frac{a + N\text{mc}}{N + 1}.$$

Hypothetical merger: results



I hate maths, what should I do?

- In symmetric markets, the reaction function is:
  - $q_i = \frac{a-mc}{b(N+1)}$
- In symmetric markets ($Q = N * q_i$), the total quantity is:
  - $Q = N\frac{a-mc}{b(N+1)}$
- In symmetric markets ($Q = N * q_i$), the price is:
  - $P = \frac{a+Nmc}{N+1}$

Case study

- Three symmetric firms, with following demand function:
  - $P = 1 - Q, i.e.\ P = 1 - (q_1 + q_2 + q_3)$
  - $mc = 0$
- Two firms want to merge
- Calculate:
  - Pre and post-merger quantities
  - Pre and post-merger prices