

Oligopoly

① Price that each firm chooses
Quantity that each firm produces } 4 variables of interest

② Homogenous Product
2 firms in market }

③ Price leader | quantity leader
Price follower | quantity follower

④ Strategic interactions
↳ sequential games

Simultaneous Games

↳ each firm can simultaneously choose price or quantity.

4 possibilities

- ① quantity leadership
- ② Price leadership
- ③ simultaneous qty setting
- ④ " " Price setting

Another possibility

↳ collusion (cooper^t game)

① Quantity leadership

↳ what output should leader choose to maximize its profit?

Followers' Problem

In order for leader to make a sensible decision, it has to consider follower's profit max. problem

Follower

$$\max_{y_2} P(y_1, y_2) y_2 - C_2(y_2)$$

The leader's output is predetermined. The production by leader has already been made, and follower simply views it as a constant.

followers choose an output where $MR = MC$

$$MR_2 = P(y_1 + y_2) + \frac{\Delta P}{\Delta y_2} y_2 = MC_2$$

$$y_2 = f_2(y_1) \rightarrow \text{Reaction function.}$$

$$\pi_2(y_1, y_2) = [a - b(y_1 + y_2)]y_2 \quad [\text{since cost} = 0]$$

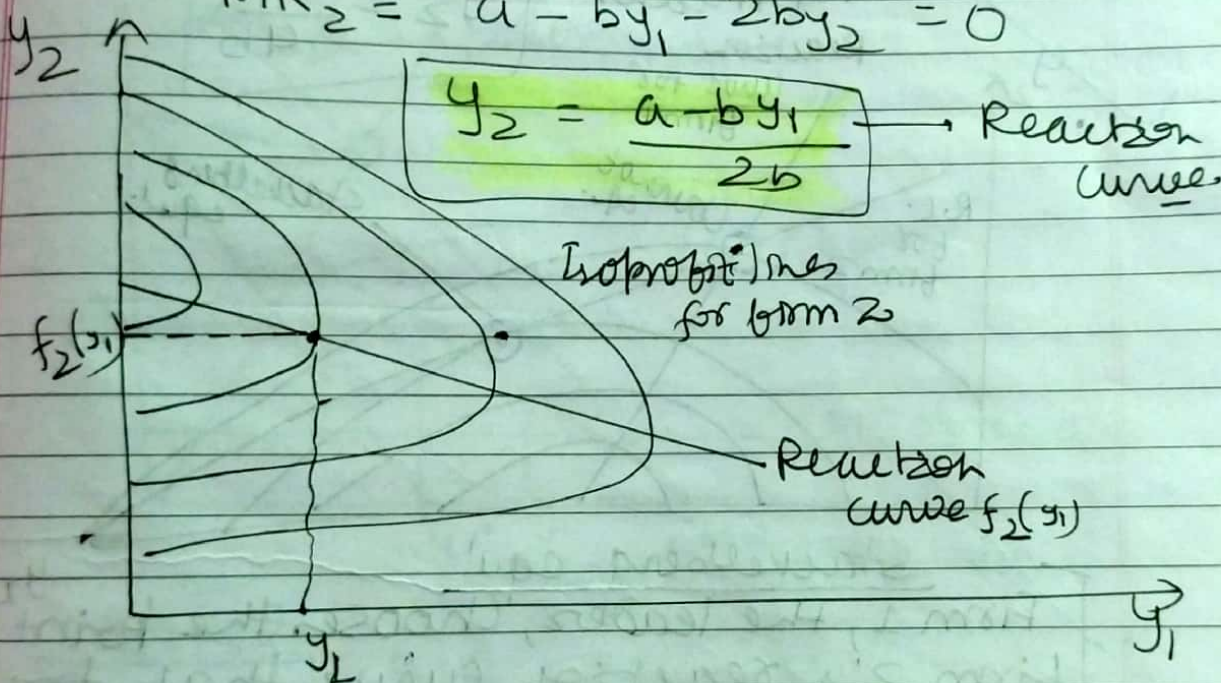
$$\pi_2 = ay_2 - by_1y_2 - by_2^2$$

Use this expression to draw isoprofit lines

$$ay_2 - by_1y_2 - by_2^2 = \pi_2$$

For each possible choice of y_1 , firm 2 has y_2 :

$$MR_2 = a - by_1 - 2by_2 = 0$$



When $y_1 = 0$, $y_2 = \text{Monopolist} = \text{Maximum profit}$

Leader's problem

$$\max_{y_1} P(y_1 + y_2)y_1 - C_1(y_1)$$

$$\text{such that } y_2 = f_2(y_1)$$

$$\max_{y_1} P[y_1 + f_2(y_1)]y_1 - C_1(y_1)$$

When leader contemplates changing its output it has to recognise the influence it exerts on followers.