

Today 14:23

I am [REDACTED] a BE student who study EE481 with you. I am writing this email to ask you about the materials.

Q1: From the picture 1 and 2, I wonder why we do not use $MC = 50$ (5 firms, MC per firm = 10) when we have to compute for the profit of the collusion (behaving like Monopoly).

Thank you for introducing yourself to me!

Answer:

→ MC is the marginal cost of producing 1 more unit of output. So, if the producer is a cartel composed of 5 firms, their marginal cost of produce 1 more unit would be 10.

If each one of them produce 1 more unit "EACH", then the mc would be 50... but in that case, the cartel would be producing 5 more units (not 1 more unit).

Dynamic Oligopoly

Example: the exact value of δ (cont.)

Picture 1.

π_i^q = checking profit $\rightarrow$ the firm leads q_i^* that maximizes its profit given that all other firms still produce the **correlated quantity** ($Q_2^* = Q_3^* = 12 + q_i^*$)

$\pi_i^q = P \cdot q_i^q - MC \cdot q_i^q$
 $= (P - MC) q_i^q$
 $= (130 - (4 \cdot q_i^q + q_i^q)) - 10) q_i^q$
 $= (130 - (4 + 1)q_i^q - 10) q_i^q$
 $= (72 - 5q_i^q) q_i^q$
 $= 72q_i^q - 5q_i^{q^2}$

$FOC: \frac{\partial \pi_i^q}{\partial q_i^q} = 72 - 2q_i^q = 0$

$q_i^q = 36$

$\pi_i^q = (72 - 5 \cdot 36) \cdot 36 = -894$

$\pi_i^{mono} = TR - TC$, constant MC
 $= PQ - MC \cdot Q$
 $= (P - MC)Q$ $\rightarrow$ **own demand** P_Q
 $= (P(Q) - MC)Q$ $\rightarrow$ **50?**
 $= (130 - Q - 10)Q$
 $= 120Q - Q^2$

$FOC: \frac{\partial \pi_i^{mono}}{\partial Q} = 120 - 2Q = 0$

$Q = 60$

$\pi_i^{mono} = (P - MC)Q$
 $= (130 - 60 - 10)60$
 $= 60 \cdot 60 = 3600$

$\frac{\pi_i^{mono}}{5} = \frac{3600}{5} = 720 = \pi_i^*$

Annotations:
 - include all 5 firms
 - you produce a lot more than your competitors
 - π_i^q is quantity
 - Q is quantity
 - $Q_2^* = Q_3^* = 12 + q_i^*$
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Dynamic Oligopoly

Example: the exact value of δ

Picture 2

Suppose there are 5 firms in the market. Each firm's marginal cost is 10 and the market demand curve is $P = 130 - Q$. Find the value of δ that makes collusion sustained in this case.

$$\delta > \frac{\pi_i^r - \pi_i^v}{\pi_i^c - \pi_i^v}$$

- We need to find $\pi_i^r, \pi_i^*, \pi_i^c$ for each firm.

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Q2: From the picture 3 and 4, Could you please clarify more about the conduct parameter? I wonder why, in the case of third-degree price discrimination, the conduct parameter for monopoly is 1, but it is also equal to one in the case of cournot.

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$$\frac{P - MC_i}{P} = -\frac{1}{\varepsilon_i} \cdot S_i = \theta$$

$$= \frac{S_i \cdot \theta}{|\varepsilon_i|}$$

$\frac{\partial Q}{\partial q_i} = \theta$ is a conduct parameter

$$\theta \in [0, \frac{1}{S_i}]$$

θ is a measure of the degree of collusion between firms. $\theta = 0$ if perfect competition, $\theta = 1$ if monopoly.

$\theta = 0$ if perfect competition, $\frac{\partial Q}{\partial q_i} \approx 0$ bc firm i is very small in this market.

$\theta = 1$ if cannot (non-cooperative oligopoly) bc firm i produce independently

$\theta = \frac{1}{S_i}$ if cartel bc each firm produces = market share to achieve 1 unit increase in the total market quantity.

$$S_i \in [0, 1]$$

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First- and Third-Degree

Third-Degree Price Discrimination

- Profit-maximizing price for "each group" of consumers. There could be some deadweight loss.

$$\text{from: } \frac{P - MC_i}{P} = \frac{|\eta_{D_i}|}{|\varepsilon_i|} \rightarrow \frac{1}{S_i} = \frac{1}{1} = 1 \text{ } \} \text{ monopoly}$$

$\rightarrow$ Assume supplier is a monopoly on their residual demand.

$$|\eta_{D_i}| = 1, \theta = \frac{1}{S_i} = 1$$

$$\frac{P - MC_i}{P} = \frac{1}{|\varepsilon_i|}$$

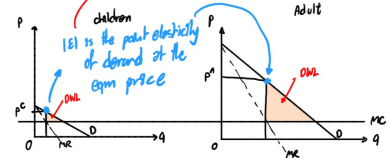
$$P = \frac{P}{|\varepsilon_i|} + MC_i$$

$$\left(\frac{P - P}{|\varepsilon_i|} \right) = MC_i$$

$$P \left(1 - \frac{1}{|\varepsilon_i|} \right) = MC_i$$

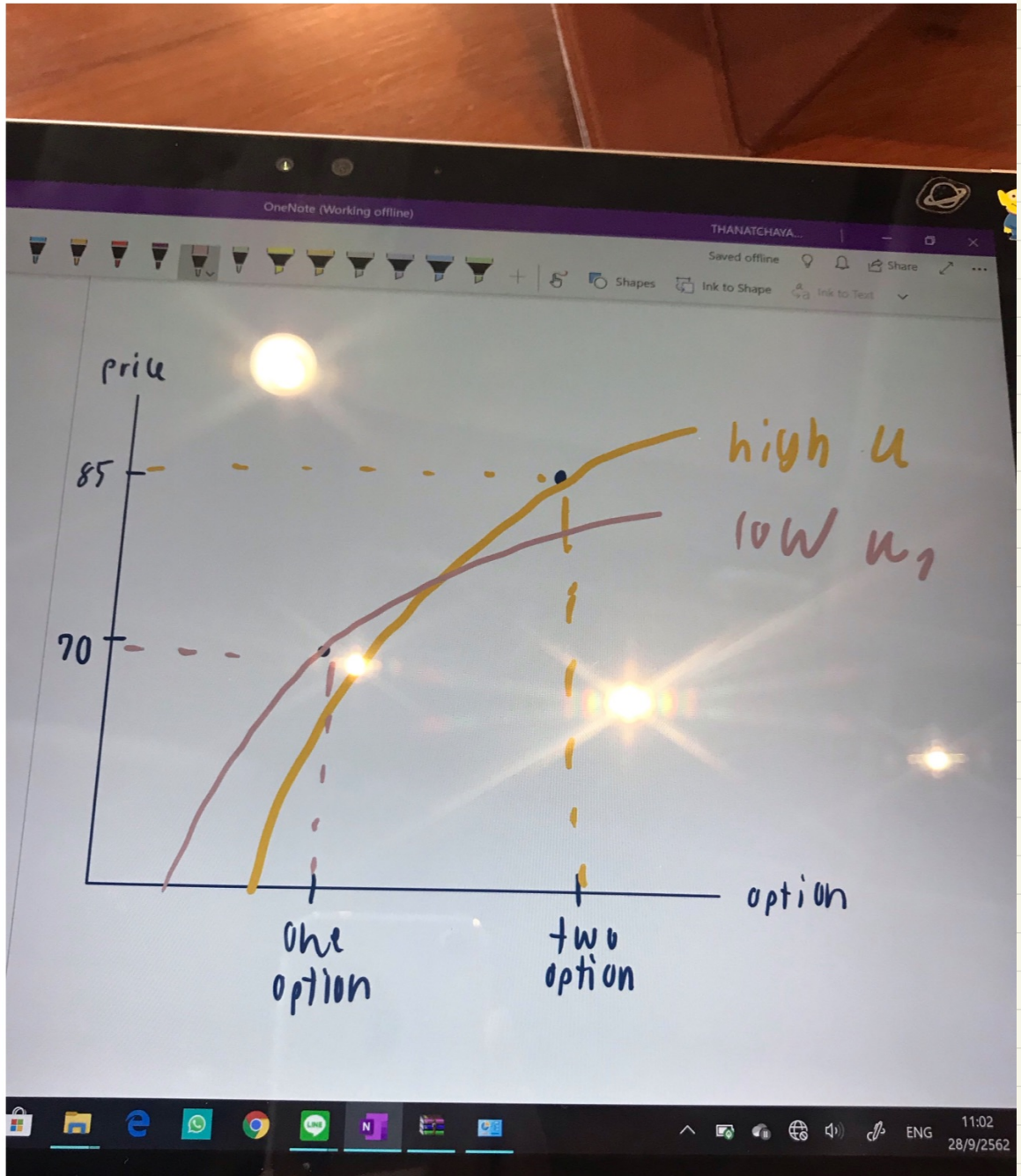
$$P = \frac{MC_i}{\left(1 - \frac{1}{|\varepsilon_i|} \right)}$$

The group price the firm charges depend on the point elasticity of demand of the customer ($|\varepsilon_i|$)
The higher the $|\varepsilon_i|$, the lower the P .



อาจารย์คะ หนูขอถามว่าเรื่อง two two part tariff อะค่ะ ว่า

1.เวลาเราวาดกราฟของ low type มันจำเป็นต้องวาดเป็นเส้นที่ U_0 ตลอดมั้ยคะ หรือว่าจริงๆไม่จำเป็นต้อง เช่นข้อ the economist หนูวาดแบบนี้ได้มั้ยคะ



ตอบ: It is possible to draw the low-type indifference curve as shown in the picture. However, this drawing does not assume that the Economist has extracted "all" the possible consumer surplus from the low-type. In other words, they can do better by charging a higher price for the digital only or print only options.

If the low-type indifference curve starts from the origin and go through the "one option" bundle, this will assume that the Economist is able to extract the maximum surplus from the low-type.

2.เส้น U_0 มันมีความหมายว่า utility เราเป็น 0 แล้วทำไมคนถึงต้องซื้อของอันนั้นด้วยคะ เวลาเราเอาไปตัดกับ option ที่ firm เสนอมาอะคะ

U_0 means additional utility from consuming the product = 0. You are absolutely right--if someone receive no utility from consuming something, why would they consume it? In real life, this similar to a situation where the winner of an auction ends up paying a price equals to their willingness to pay.

In theory, we just assume that the firm is smart enough to offer a bundle which extracts all the consumer surplus (CS) from low-type consumers. Therefore, the consumers are "just" indifferent between consuming and not consuming. In which case, we assume that they buy.

3.แล้วเส้นนั้นมันแสดงถึงการที่ firm capture all CS ด้วยรีเปลา

ใช่คะ