이윤 = Rev(13장?) - Cost(12장)

13. Firms in Competitive Markets

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Questions:

In this chapter, we ask

- What is a perfectly competitive market?
- What is marginal revenue?
  How is it related to total and average revenue?
- How does a competitive firm determine the quantity that maximizes profits?
- When might a competitive firm shut down in the short run?
  Exit the market in the long run?
- What does the market supply curve look like in the short run?
  In the long run?

Introduction: A Scenario

- Three years after graduating, you run your own business.
- You must decide how much to produce, what price to charge, how many workers to hire, etc.
- What factors should affect these decisions?
  - Your costs (studied in preceding chapter)
  - How much competition you face
- We begin by studying the behavior of firms in perfectly competitive markets.

Characteristics of Perfect Competition

1. Many buyers and many sellers.
2. The goods offered for sale are largely the same.
3. Firms can freely enter or exit the market.

- 1 & 2 $\Rightarrow$ Buyers and sellers act as "price taker".

The Revenue of a Competitive Firm

- Total revenue (TR)

$$\text{TR} = P \times Q$$

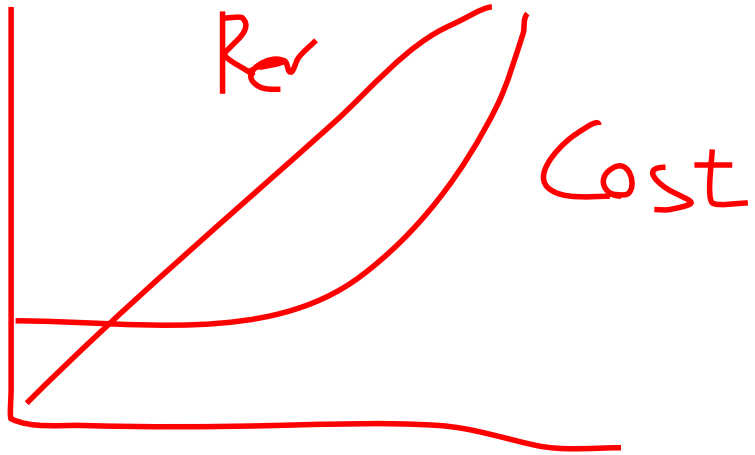
- Average revenue (AR)

$$\text{AR} = \text{TR}/Q = P$$

- Marginal revenue (MR):The change in TR from selling one more unit.

$$\text{MR} = \frac{\Delta \text{TR}}{\Delta Q} = P$$

MR = P for a Competitive Firm



- A competitive firm can keep increasing its output without affecting the market price.
- So, each one-unit increase in Q causes revenue to rise by P, i.e., MR= P.

* MR= P is only true for firms in competitive markets.

Profit Maximization

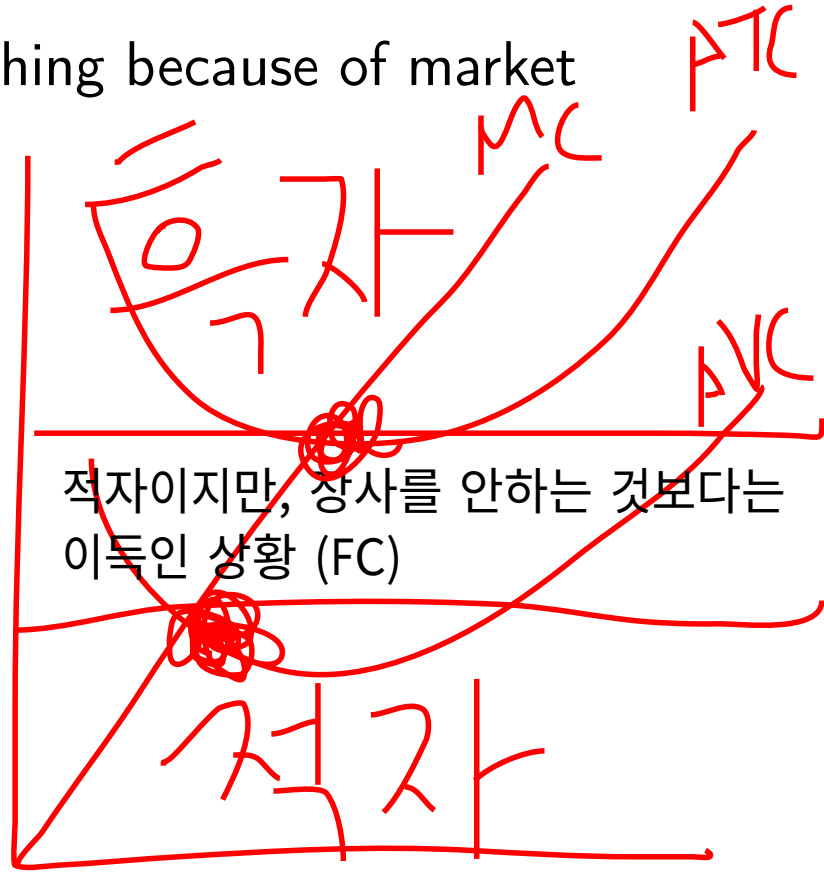
완전경쟁시장에서는 MR=MC인 지점이 최고의 수익을 올리는 곳이다.

- What Q maximizes the firm's profit?
- To find the answer, "think at the margin."
- If increase Q by one unit,revenue rises by MR,cost rises by MC.
  - If MR $>$ MC, then increase Q to raise profit.
  - If MR $<$ MC, then reduce Q to raise profit.
- **the MC curve is the firm's supply curve!!**

Shutdown vs. Exit

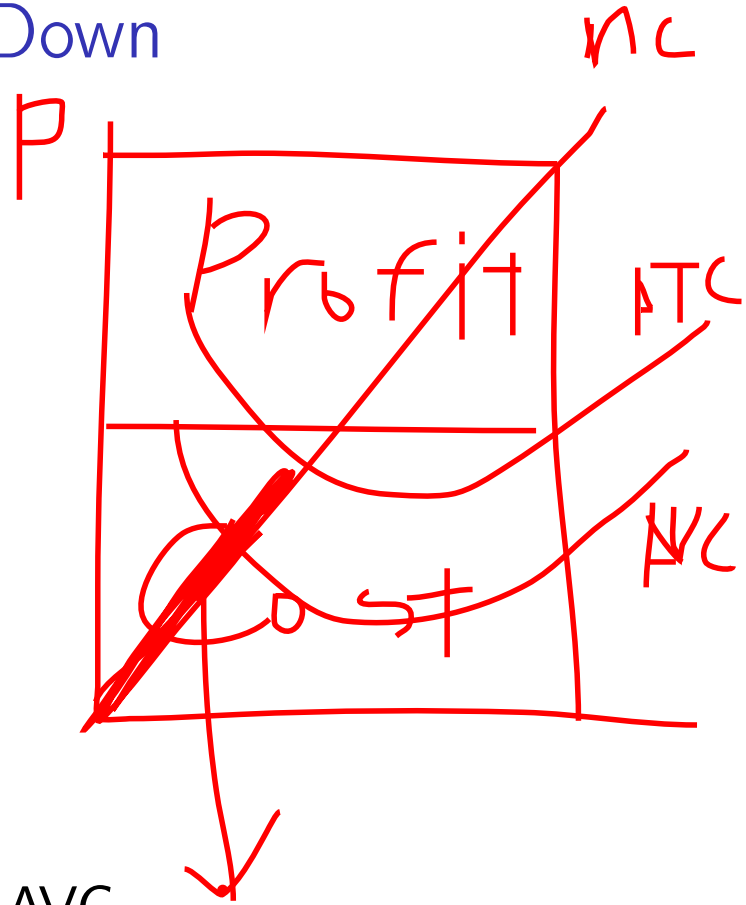
단기적으로는 FC를 고려 ㄴㄴ(어차피 내야한다.)
장기적으로는 FC를 고려 ㅇㅇ.
Shutdown은 잠시 장사를 안하는 것이고(휴업), Exit는 걍 던지는거다.(폐업)

- Shutdown:
  A short-run decision not to produce anything because of market conditions.
- Exit:
  A long-run decision to leave the market.
- A key difference:
  - If shut down in SR, must still pay FC.
  - If exit in LR, zero costs.



Prcfit = Rev - Cost

A Firm's Short-run Decision to Shut Down



- Cost of shutting down: revenue loss = TR
- Benefit of shutting down:
  cost savings = VC (firm must still pay FC)
- So, shut down if TR $<$ VC
- Divide both sides by Q: TR/Q $<$ VC/Q
- So, firm's decision rule is:

Shut down if $P <$ AVC

이 지점에서는 손해이다.

AVC인 이유는 FC는 어차피 내야하는 것이기 때문이다.
(적자이지만, 장사를 안하는 것 보다는 이득인 상황)

A Competitive Firm's SR Supply Curve

- If $P >$ AVC, then firm produces Q where P=MC
- If $P <$ AVC, then firm shuts down (produce Q=0).

The Irrelevance of Sunk Costs

- Sunk cost: a cost that has already been committed and cannot be recovered
- Sunk costs should be irrelevant to decisions;
  you must pay them regardless of your choice.
- FC is a sunk cost:
  The firm must pay its fixed costs whether it produces or shuts down.
- So, FC should not matter in the decision to shut down.

A Firm's Long-Run Decision to Exit

길게볼때 P<ATC면 나간다.

- Cost of exiting the market: revenue loss = TR
- Benefit of exiting the market:
  cost savings = TC (zero FC in the long run)
- So, firm exits if TR < TC
- Divide both sides by Q to write the firm's decision rule as:

$$\text{EXIT} \quad \text{if } P < \text{ATC}$$

A New Firm's Decision to Enter Market

P>ATC면 들어간다.

- In the long run, a new firm will enter the market if it is profitable to do so: if TR $>$ TC.
- Divide both sides by Q to express the firm's entry decision as:

$$\text{ENTER} \quad \text{if } P > \text{ATC}$$

Market Supply: Assumptions

1. All existing firms and potential entrants have identical costs.
2. Each firm's costs do not change as other firms enter or exit the market.
3. The number of firms in the market is
   - fixed in the short run (due to fixed costs)
   - variable in the long run (due to free entry and exit)

The SR Market Supply Curve

- As long as $P \geq$ AVC, each firm will produce its profit-maximizing quantity, where MR = MC.
- Recall from Chapter 4: At each price, the market quantity supplied is the sum of quantities supplied by all firms.

Entry & Exit in the Long Run

- In the LR, the number of firms can change due to entry & exit.
- If existing firms earn positive economic profit,
  - new firms enter, SR market supply shifts right.
  - P falls, reducing profits and slowing entry.
- If existing firms incur losses,
  - some firms exit, SR market supply shifts left.
  - P rises, reducing remaining firms' losses.

The Zero-Profit Condition

- Long-run equilibrium: The process of entry or exit is complete–remaining firms earn zero economic profit.
- Zero economic profit occurs when $P = \text{ATC}$.
- Since firms produce where $P = \text{MR} = \text{MC}$, the zero-profit condition is $P = \text{MC} = \text{ATC}$.
- Recall that MC intersects ATC at minimum ATC.
- Hence, in the long run, $\boxed{P = \text{minimum ATC}}$.

(이윤이 남으면 들어오기 때문에)

Why Do Firms Stay in Business if Profit is zero?

- Recall, economic profit is revenue minus **all** costs, including implicit costs like the opportunity cost of the owner's time and money.
- In the zero-profit equilibrium,
  - firms earn enough revenue to cover these costs
  - accounting profit is positive

The Long-Run Supply Curve

- In the long run, the typical firm earns zero profit.
- The LR market supply curve is horizontal at P = minimum ATC.
- SR & LR Effects of an Increase in Demand
  1. A firm begins in long-run eq...
  2. ...but then an increase in demand raises P,...
  3. ...leading to SR profits for the firm.
  4. Over time, profits induce entry, shifting S to the right, reducing P...
  5. ...driving profits to zero and restoring long-run eq.

Why the LR Supply Curve Might Slope Upward

- The LR market supply curve is horizontal if
  1. all firms have identical costs, and
  2. costs do not change as other firms enter or exit the market.
- If either of these assumptions is not true, then LR supply curve slopes upward.

1) Firms Have Different Costs

- As P rises, firms with lower costs enter the market before those with higher costs.
- Further increases in P make it worthwhile for higher-cost firms to enter the market, which increases market quantity supplied.
- Hence, LR market supply curve slopes upward.
- At any P,
  - For the *marginal* firm, $P =$ minimum ATC and profit $= 0$.
  - For lower-cost firms, profit > 0.

2) Costs Rise as Firms Enter the Market

- In some industries, the supply of a key input is limited (e.g., amount of land suitable for farming is fixed).
- The entry of new firms increases demand for this input, causing its price to rise.
- This increases all firms' costs.
- Hence, an increase in P is required to increase the market quantity supplied, so the supply curve is upward-sloping.

CONCLUSION: The Efficiency of a Competitive Market

- Profit-maximization: MC = MR
- Perfect competition: P = MR
- So, in the competitive eq: P = MC
- Recall, MC is cost of producing the marginal unit. P is value to buyers of the marginal unit.
- So, the competitive eq is efficient, maximizes total surplus.
- In the next chapter, monopoly: pricing and production decisions, deadweight loss, regulation.