Elements of Microeconomics: TA Session

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Competitive market

In a (perfectly) competitive market, buyers and sellers are **price takers**

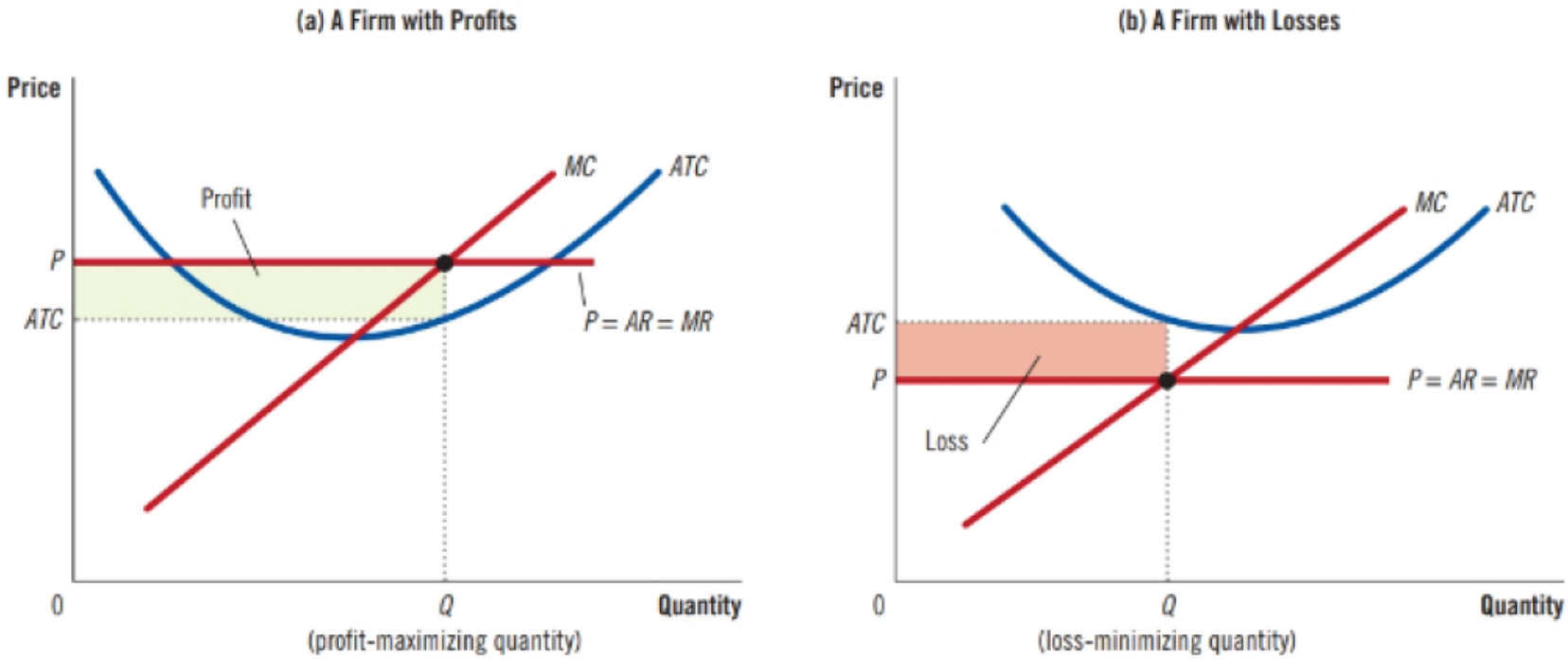
Three characteristics of a perfectly competitive market:

- The market has many buyers and sellers
- The goods offered by sellers are (largely) the same
- Firms can freely enter or exit the market

For a firm in a perfectly competitive market:
average revenue = marginal revenue = price

Profits and losses

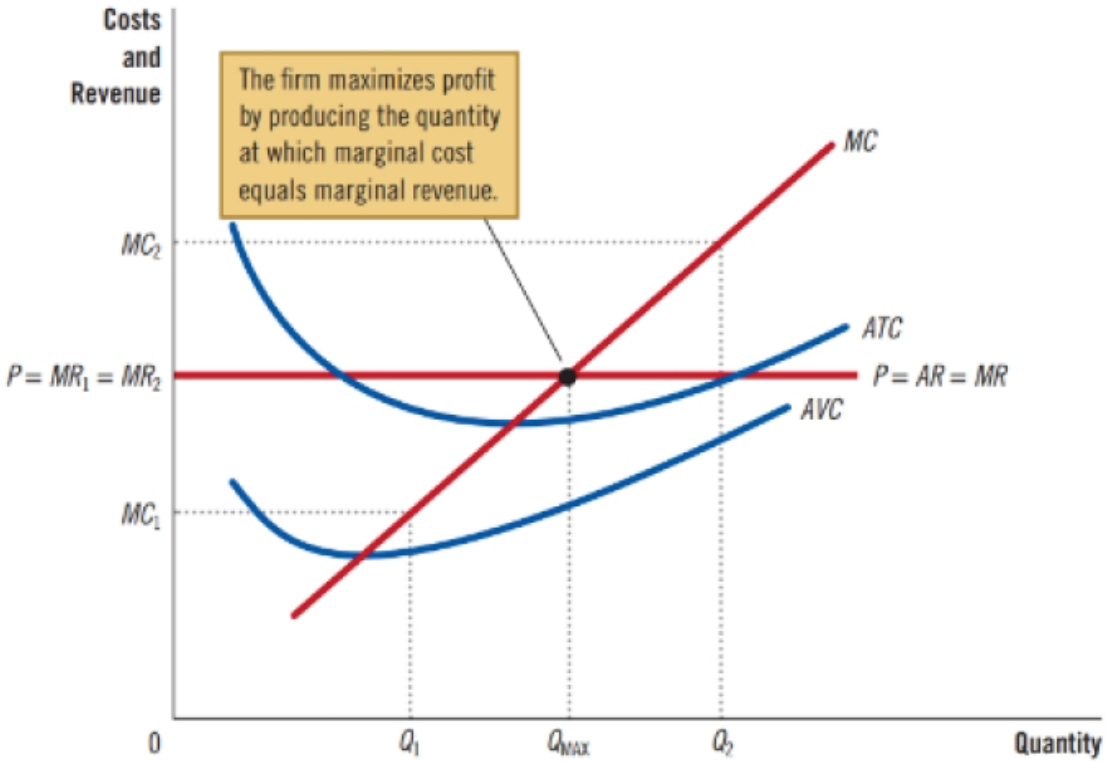
$$\text{Profit} = (P - ATC) \times Q$$



Profit maximization

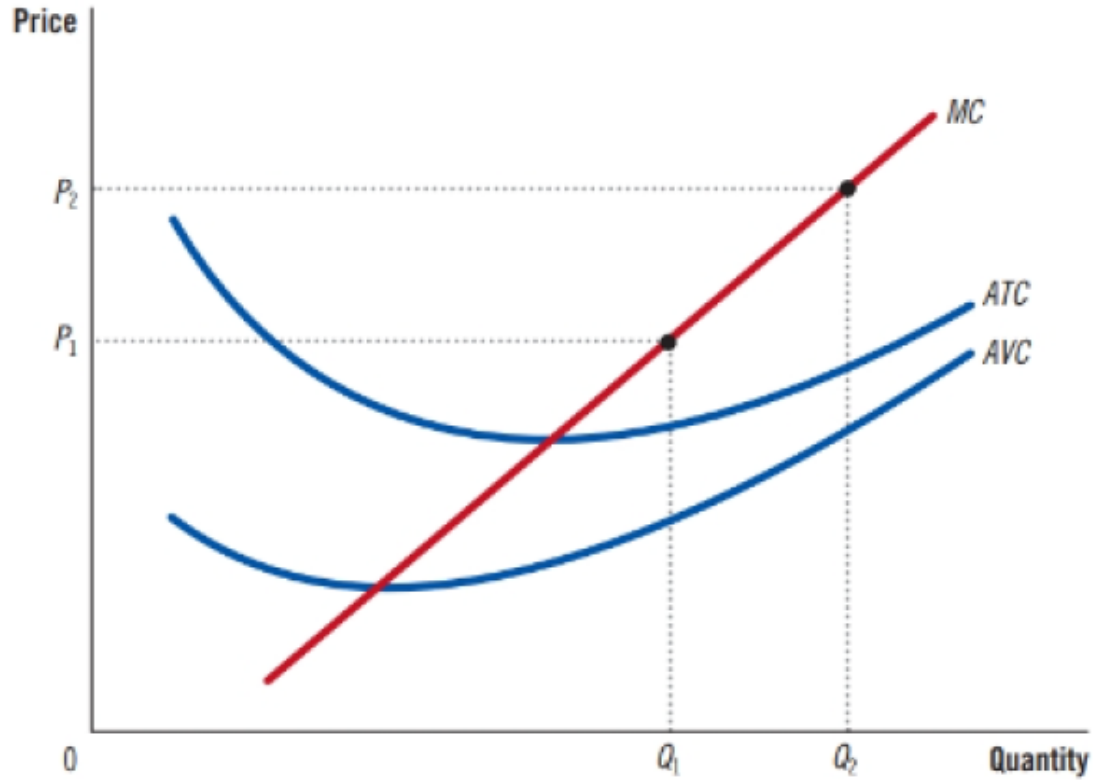
To maximize profit, the firm chooses the quantity of production where $MR = MC$

- Recall from chapter 1 that the firm keeps producing until marginal benefit equals marginal cost



Competitive firm's supply curve

The MC curve is the competitive firm's supply curve



The decision to shut down

- **Shutdown:** a short-run decision not to produce anything during a specific period due to current market conditions
- **Exit:** a long-run decision to permanently leave the market

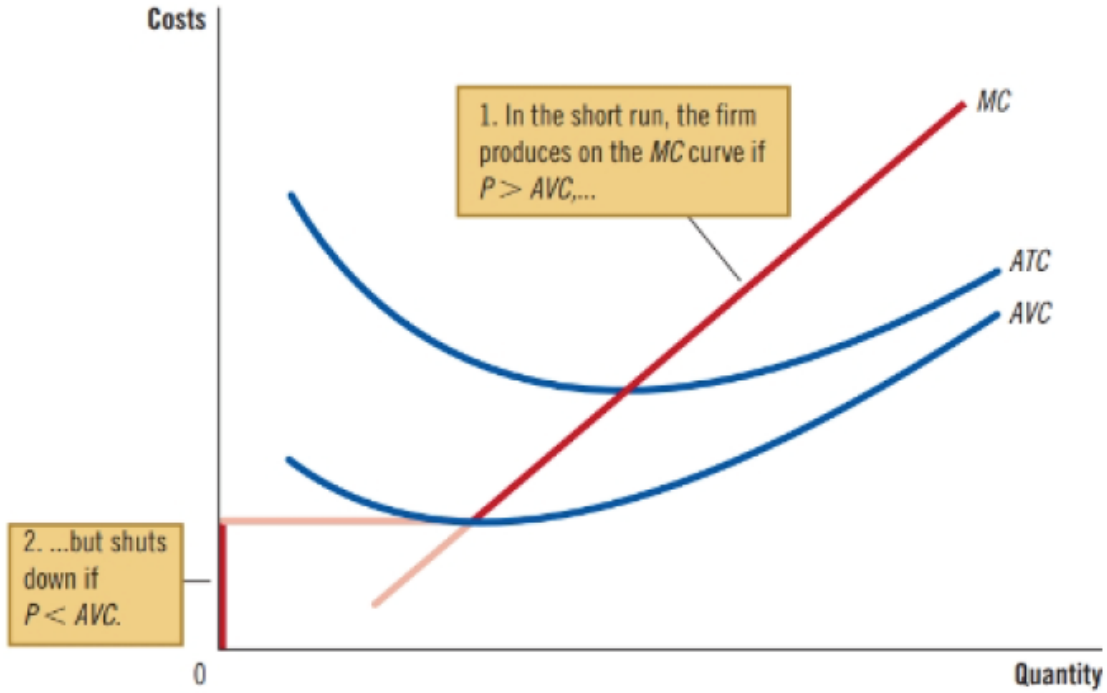
When a firm shuts down, it pays no variable cost and earns no revenue

A firm chooses to shut down if:

$$\begin{aligned} & TR < VC \\ \implies & TR/Q < VC/Q \\ \implies & P < AVC \end{aligned}$$

The decision to shut down

A firm shuts down if $P < AVC$



Recall that MC and AVC curves cross where AVC is lowest

- The firm chooses to shut down if price is lower than the firm's minimal AVC
- The firm's short-run supply curve is the part of MC curve that lies above the AVC curve

The decision to exit

In the short run, a firm's fixed cost is a **sunk cost**: a cost that has already been committed and cannot be recovered

But in the long run, the decision to exit the market will save the fixed costs as well

A firm chooses to exit if:

$$\begin{aligned} & TR < TC \\ \Longrightarrow\ & TR/Q < TC/Q \\ \Longrightarrow\ & P < ATC \end{aligned}$$

On the contrary, a firm chooses to enter if:

$$P > ATC$$

- If profits are positive, more firms will enter the market; if profits are negative, existing firms will exit the market
- **In equilibrium, all firms make zero profit!**

Competitive market's short-run supply curve

Suppose all firms in the market are identical

In the short run, the number of firms is fixed. To derive the entire market's supply curve, just multiply Q by the number of firms

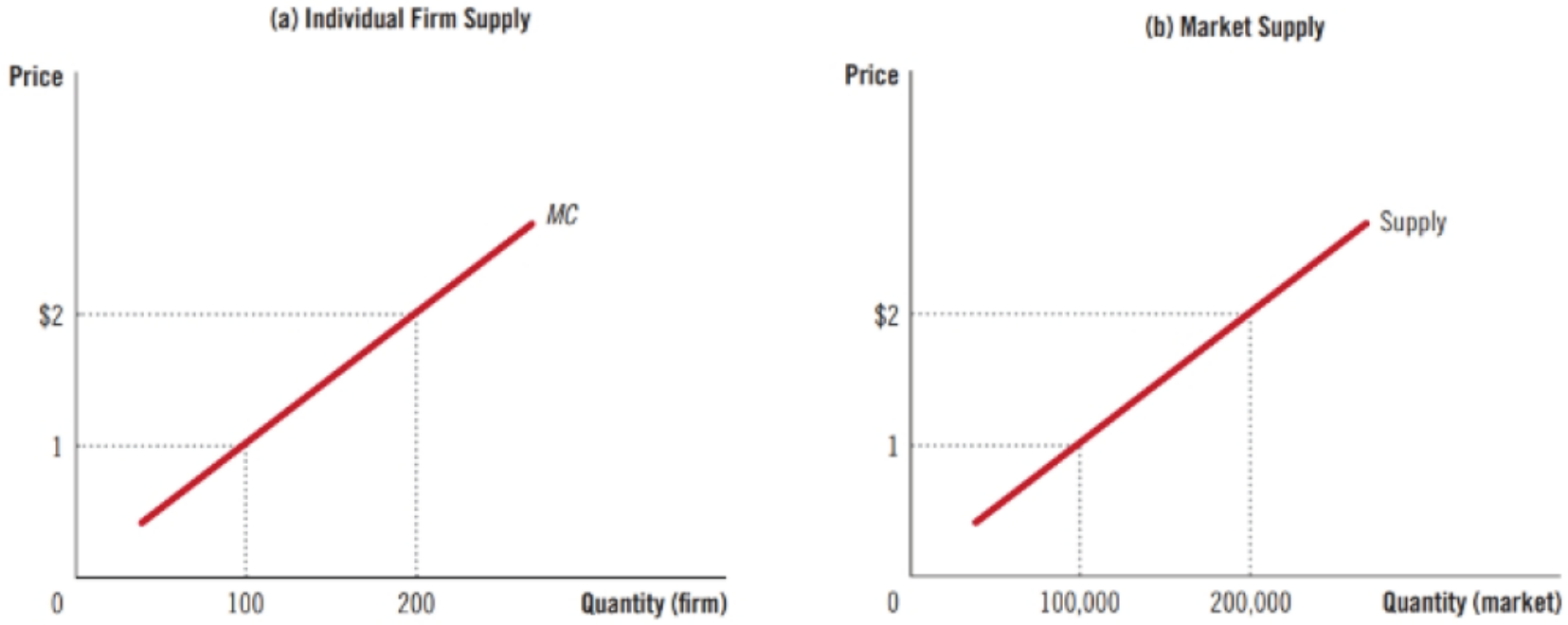


Figure: Market with 1,000 firms

Competitive market - exercise

Consider a perfectly competitive market for apple pies. The market demand curve is $Q = 400 - 5P$. Each firm's short-term supply curve is $q = 2 + \frac{P}{2}$. Each firm's AVC and FC is given below.

Quantity	AVC	FC
5	1	36
6	2	36
7	3	36
8	4	36
9	5	36

1. At the beginning, there are 74 identical firms in this market.
   (a) What is the market's short-term supply curve?
   (b) What is the market's shot-term equilibrium price and quantity?
   (c) What is each firm's profit?
   (d) In the long run, how will the number of firms change?

Competitive market - exercise

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Quantity	AVC	FC
5	1	36
6	2	36
7	3	36
8	4	36
9	5	36

2. Suppose the number of firms decreases to 50.
   (a) What is the market's short-term supply curve?
   (b) What is the market's shot-term equilibrium price and quantity?
   (c) What is each firm's profit?
   (d) In the long run, how will the number of firms change?

Competitive market - exercise

Consider a perfectly competitive market for apple pies. The market demand curve is $Q = 400 - 5P$. Each firm's short-term supply curve is $q = 2 + \frac{P}{2}$. Each firm's AVC and FC is given below.

Quantity	AVC	FC
5	1	36
6	2	36
7	3	36
8	4	36
9	5	36

3. Suppose the number of firms is now 60.
   (a) What is the market's short-term supply curve?
   (b) What is the market's shot-term equilibrium price and quantity?
   (c) What is each firm's profit?
   (d) In the long run, how will the number of firms change?

Competitive market exercise - explained

1. Market's short-term supply curve: $Q = 74 \times (2 + \frac{P}{2}) = 148 + 37P$

   Short-term market equilibrium:
   $Q = 148 + 37P = 400 - 5P \implies P^* = 6, Q^* = 370, q^* = 5$

   Each firm's profit
   $= P^* q^* - AVC \cdot q^* - FC = 6 \times 5 - 1 \times 5 - 36 = -11$

   Profit is negative, in the long run firms will exit, and firm number will decrease.

Competitive market exercise - explained

2. Market's short-term supply curve: $Q = 50 \times (2 + \frac{P}{2}) = 100 + 25P$

   Short-term market equilibrium:
   $Q = 100 + 25P = 400 - 5P \implies P^* = 10, Q^* = 350, q^* = 7$

   Each firm's profit
   $= P^* q^* - AVC \cdot q^* - FC = 10 \times 7 - 3 \times 7 - 36 = 13$

   Profit is positive, in the long run firms will enter, and firm number will increase.

Competitive market exercise - explained

3. Market's short-term supply curve: $Q = 60 \times (2 + \frac{P}{2}) = 120 + 30P$

   Short-term market equilibrium:
   $Q = 120 + 30P = 400 - 5P \implies P^* = 8, Q^* = 360, q^* = 6$

   Each firm's profit $= P^* q^* - AVC \cdot q^* - FC = 8 \times 6 - 2 \times 6 - 36 = 0$

   Profit is zero, this is the long-run equilibrium, and firm number will not change.