



MARKETPOWER

Firms, industries and market structures

- **A firm (or business)** is an organization that employs factors of production to produce and sell a good or services.
- A group of one or more firms producing identical or similar goods or services is an **industry**.
- **Market structure** describe characteristics of a market organization that determine the behavior of firms. We use it to analyse industries.

Four market structures

The fundamental distinction between market structures is the extent to which each individual firm in the industry is **able to control the price** at which it sells its product. → **Market Power**



Market power & Market failure

The greater the market power the greater the allocative inefficiency.

- Perfect competition
 - zero market power → allocative efficiency without market failure
- Monopolistic competition
- Oligopoly
- Monopoly
 - great market power → allocative inefficiency (market failure)

Market structure	No. of firms	Product differentiation	Barriers to entry	Market power	Degree of competition	Examples
Perfect competition	Large no. of small firms	Homogeneous products (identical, no brand names)	No barriers to entry	None	Perfect	Agriculture, silver and gold, stock and bond, foreign exchange market
Monopolistic competition	Large No. of small/medium firms	Product differentiation	No barriers to entry	Some	A good amount	Shoe, clothing, computer, restaurant, novel
Oligopoly	Small no. of large firms	Differentiated or undifferentiated	High barriers to entry	Significant	Some	Coca-Cola & Pepsi, car industry, airlines Oil, steel
Monopoly	Single seller or dominant firm	Unique goods without close substitutes	High barriers to entry	Very significant	None	Electricity supply, water supply, train system in China. Microsoft operating system with windows

The background of the slide features a 3D illustration of several red stick figures running on a series of parallel, grey, arrow-shaped paths that recede into the distance. The figures are in various stages of a running stride, conveying a sense of motion and competition. The overall scene is set against a light, grid-like background.

Perfect Competition

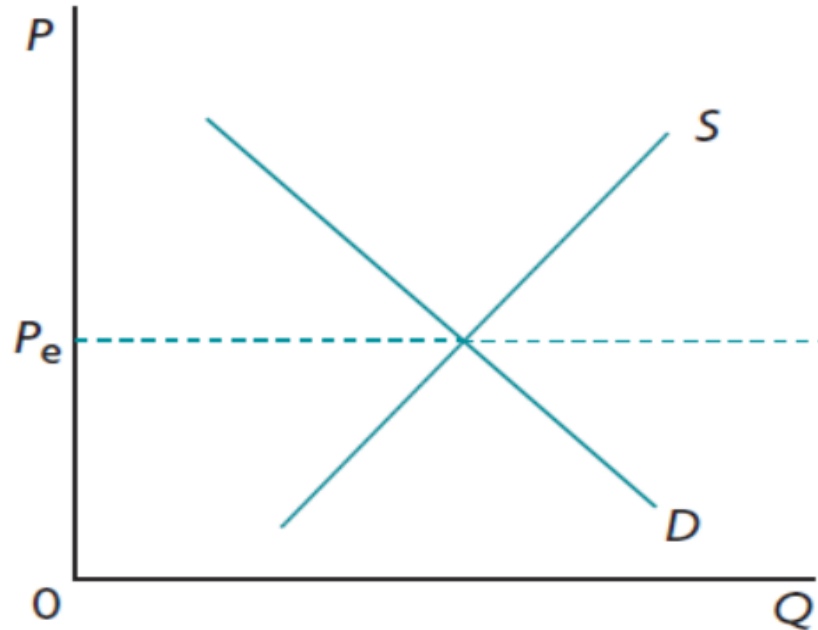
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Characteristics of perfect competition

- **A large number of firms.**
 - Small output in relation to the size of the market.
 - Firms act independently
- **All firms produce identical, or homogeneous products.** → price taker
- **Free entry and exit.**
 - no barriers to entry into and exit from the industry.
- **Perfect (complete) information.** (info. of products, prices, resources and methods of production) – no symmetric information
 - no firm has access to information not available to others that would allow it to produce at a lower cost compared to its competitors.
 - all consumers are aware of the market-determined price.
 - improvements in production technologies achieved by one firm can spill-over to all the other suppliers in the market

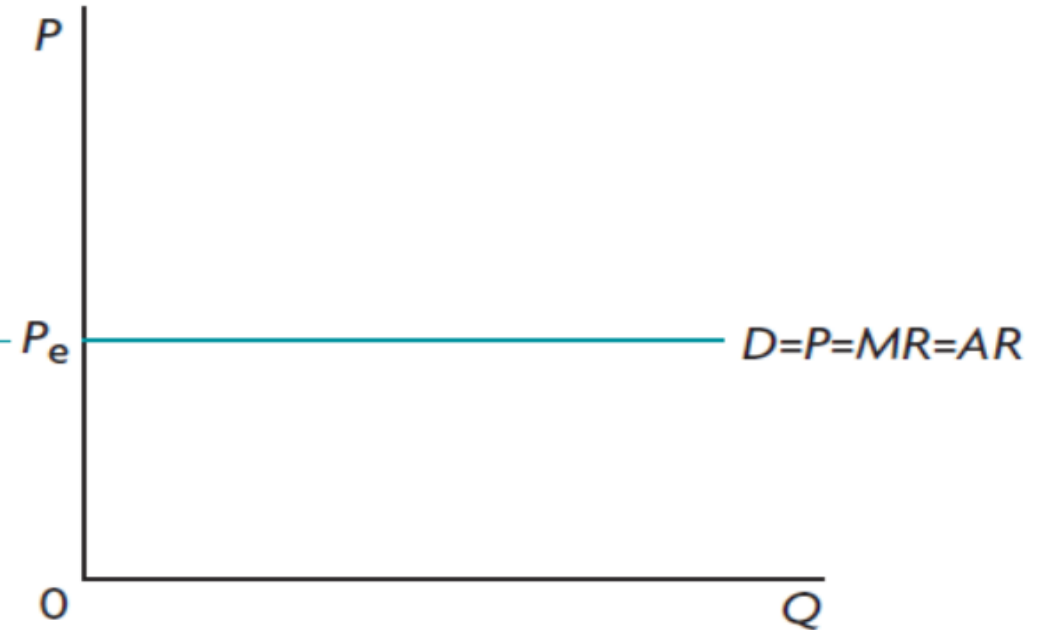
Demand curve for market & individual firm

a Market/industry



Market demand and supply curve
Market equilibrium price at P_e .

b Individual firm

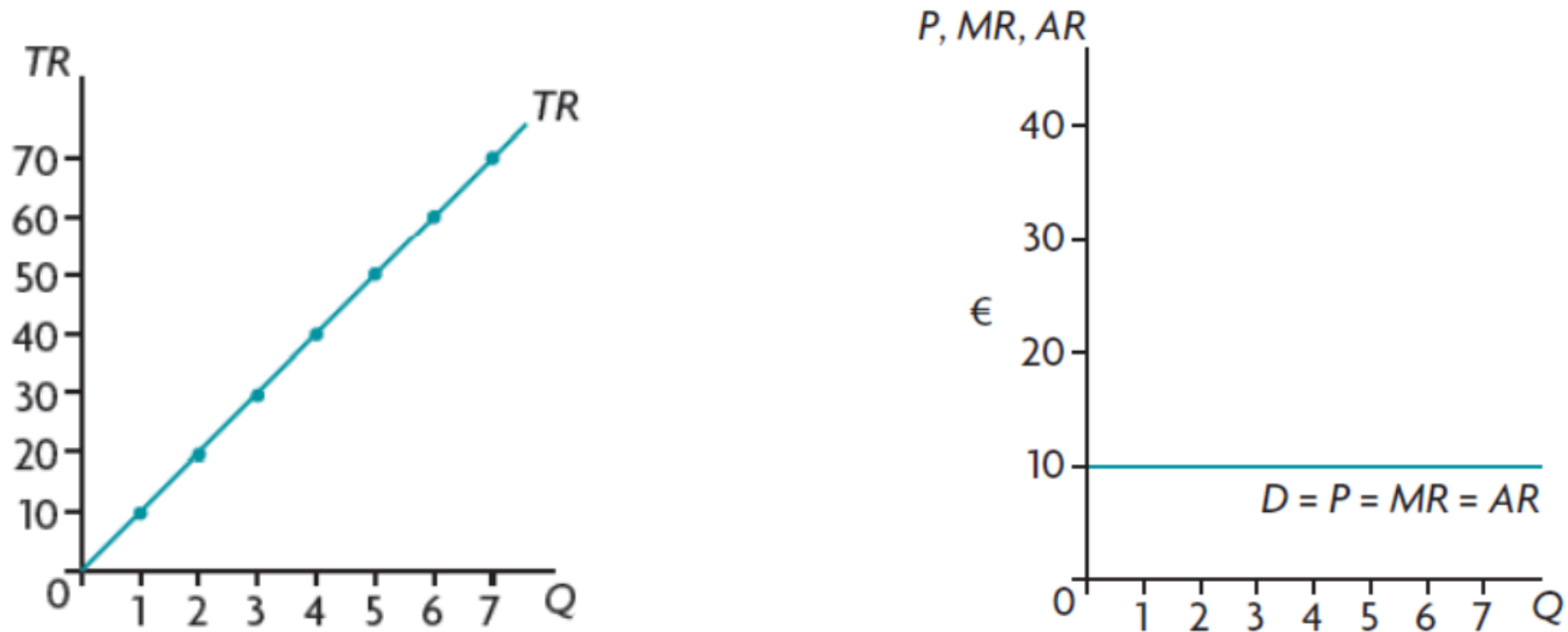


Perfect elastic of demand (=infinity)

- Each individual small firm is a price-taker, it can only accept the price and sell all the output at P_e to maximize its profit.

Revenue concept

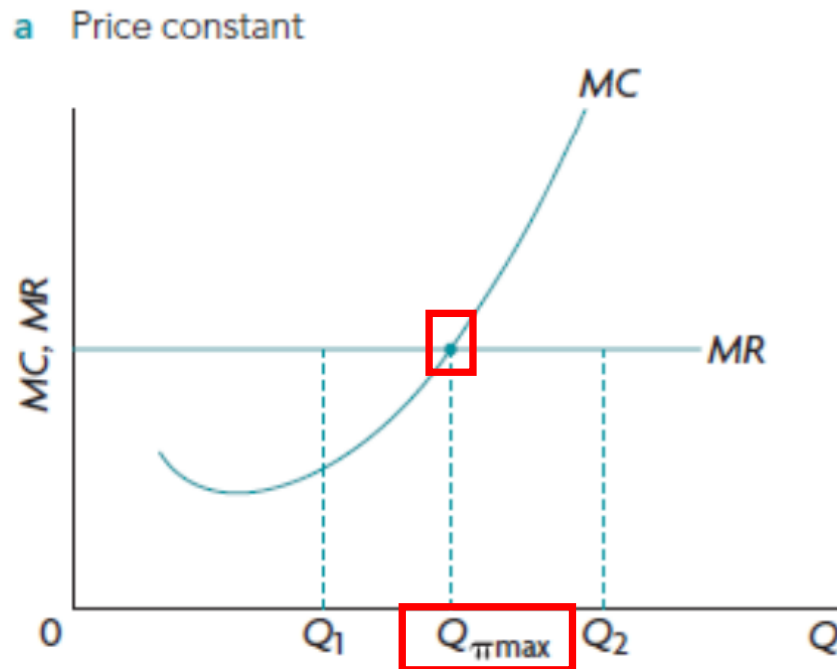
- Since all the firms are price taker, Price keeps constant.
- A firm's TR equals the given price multiplied by the quantity sold.
- A firm's marginal revenue (MR) = the change in total revenue that results from one-unit increase in the quantity sold



Short-run profit maximising level of output

At short-run, there are at least one fixed input.

→ The number of firms in the industry is also fixed. (Because to enter or leave an industry, a firm must be able to vary all its inputs.)



- The goal of the firm is to maximize profits.
- Since the firm cannot decide the price, so in order to maximize the profit, the firm can only make a choice on how much quantity of output it should produce.
- $MR = MC \rightarrow$ Profit-maximizing (loss-minimizing) level of output = $Q_{\pi\max}$

Short-run profit maximisation based on the marginal revenue and marginal cost rule

Three steps:

1. Compare marginal revenue with marginal cost to determine profit maximizing (or loss-minimizing) level of output.
2. Compare average revenue (or price) and average total cost to determine the amount of profit (or loss) per unit of output.

$$\therefore \text{Profit} = \text{TR} - \text{TC}$$

$$\therefore \text{Profit}/Q = \text{TR}/Q - \text{TC}/Q$$

$$\therefore \text{Profit}/Q = \text{AR} - \text{ATC} = P - \text{ATC}$$

Price (perfectly elastic demand curve)
decides the profit level.

→ We can compare **average revenue (price)** and **average cost** to determine the amount of profit (or loss) per unit of output and calculate the total profit (total loss)

3. Find total profit (or total loss)

$$\text{Total profit} = (\text{AR} - \text{ATC}) * Q$$

Firm with Abnormal profit

Step 1: Find $MR=MC$ for profit-maximizing (or loss-minimizing) level of output. → Q_1

Step 2: Compare $AR(P)$ and ATC to determine the amount of profit (loss) per unit of output.

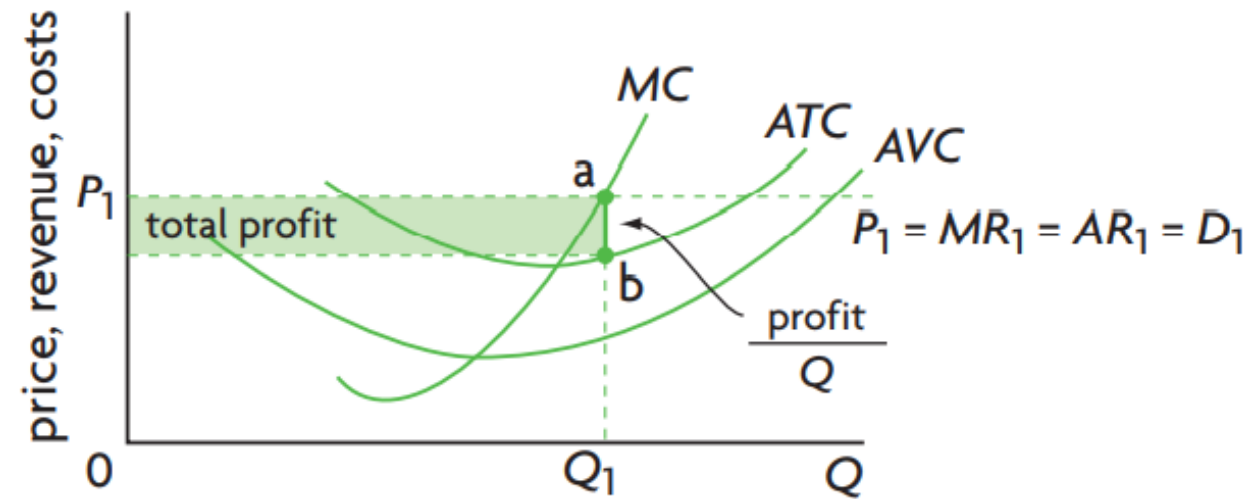
→ $AR(P) > ATC$; diff. = ab

Step 3: find total profit (loss)

→ Total profit = $ab * Q_1$

→ Abnormal profit

(a) Economic profit



Firm with normal profit

Step 1: Find $MR=MC$ for profit-maximizing (or loss-minimizing) level of output. $\rightarrow Q_2$

Step 2: Compare $AR(P)$ and ATC to determine the amount of profit (loss) per unit of output.

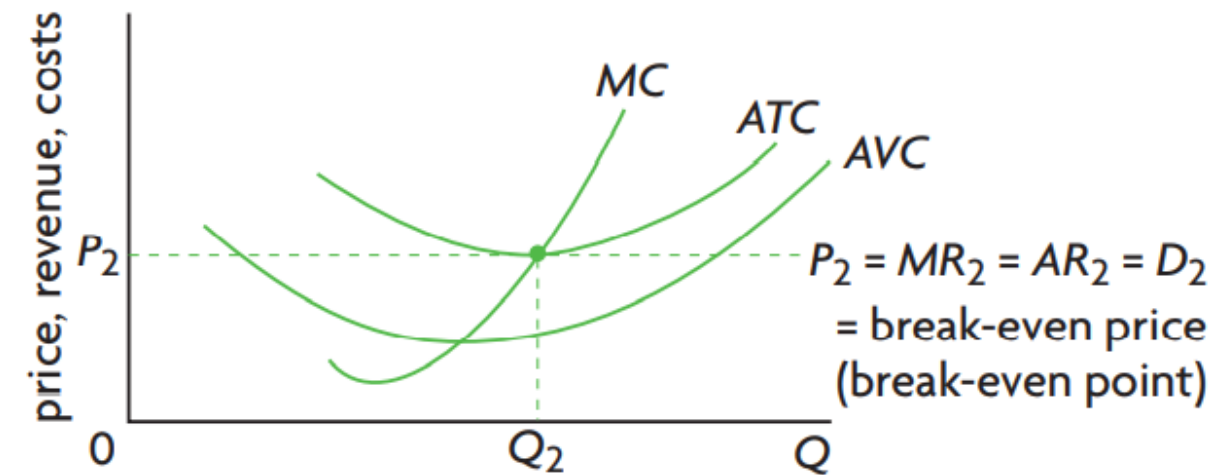
$\rightarrow AR(P)=ATC; \text{diff}=0$

Step 3: find total profit (loss)

$\rightarrow \text{Total profit} = 0 * Q_2 \text{ (Normal profit)}$

\rightarrow **Break-even point** (at this price the firm breaks even, so that its total revenues are equal to its total economic costs (implicit plus explicit)).

(b) Zero economic profit (normal profit)



Temporary shut-down in short run

- In short run, the firm cannot exit the industry, but sometimes the price falls that it cannot cover its cost, the firm will be experiencing a loss. So, it will have to make a choice of whether it should shut-down or not.
 - Choice a: shut-down.
 - Choice b: keep producing its loss-minimizing output

Temporary shut-down in short run

- $TC = TFC + TVC$
- $ATC = AVC + AFC$

- If $TC > TR > TVC$ ($ATC > AR > AVC$), the firm is able to cover all the variable cost and part of the fixed cost.
 - It will decide to keep producing its loss-minimizing output.
- If $TR = TVC$ ($AR = AVC$), the firm is indifference between keep producing and shut-down.
 - **Shut-down point**
- If $TR < TVC$ ($AR < AVC$), the firm cannot cover its variable cost.
 - It will decide to shut-down temporarily and save the variable costs.

The firm will shut down if it cannot cover average variable costs.

Firm in loss when $ATC > AR > AVC$

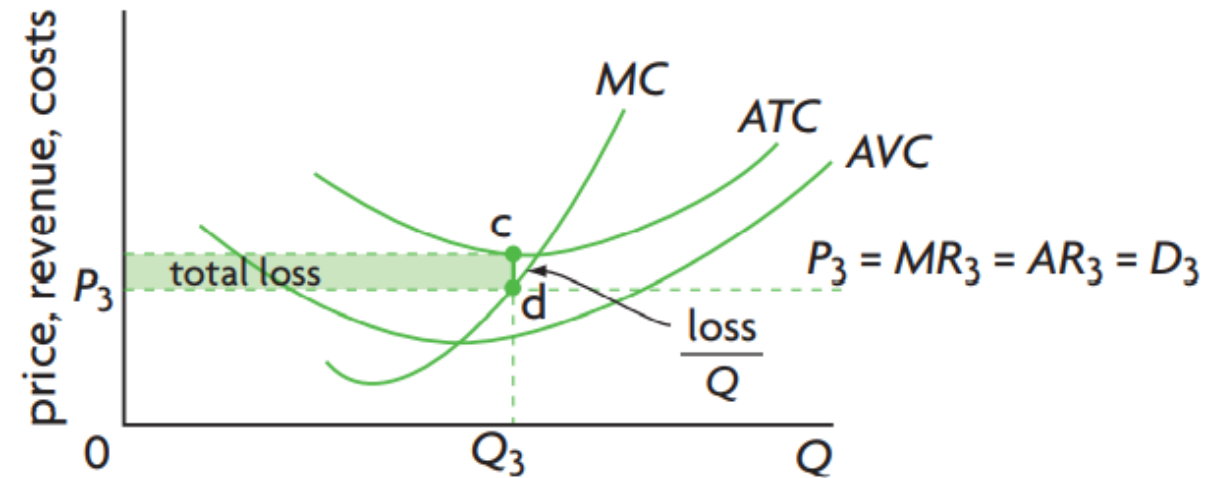
Step 1: Find $MR=MC$ for profit-maximizing (or loss-minimizing) level of output. $\rightarrow Q_3$

Step 2: Compare $AR(P)$ and AC to determine the amount of profit (loss) per unit of output. $\rightarrow AR(P) < ATC$; $\text{diff} = cd$ (negative profit) loss

Step 3: find total loss $\rightarrow cd * Q_3 \rightarrow \text{Loss}$

- The diff. between ATC & AVC is AFC . In short-run, if the firm stop the production, it will have zero revenue and zero variable cost, but it will have to pay the fixed cost anyhow.
 - Since $AR(P)$ is higher than AVC but lower than ATC .
 - To minimizing the loss, if the firm continue the production and it could cover all of its variable cost and a portion of its fixed cost, it is worthwhile to keep producing.
- \rightarrow The firm should not shut down in the short run, it should produce its loss-minimizing output. (Loss per unit = $ATC - P_3$)

(c) Economic loss: the firm continues to produce



Firm in loss when $AR = AVC$

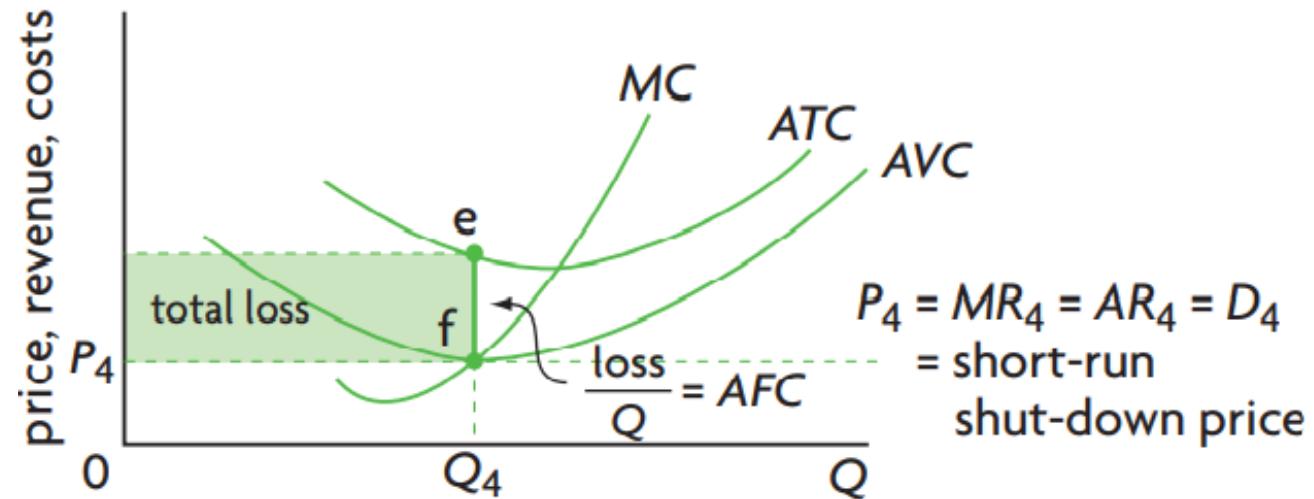
Step 1: Find $MR=MC$ for profit-maximizing (or loss-minimizing) level of output. $\rightarrow Q_4$

Step 2: Compare $AR(P)$ and AC to determine the amount of profit (loss) per unit of output. $\rightarrow AR(P) < ATC$; $\text{diff} = ef$ (negative profit) loss

Step 3: find total loss $\rightarrow ef * Q_4 \rightarrow \text{Loss}$

- price $P = \text{minimum } AVC$ is the shut-down price.
- Firm's loss per unit = $ATC - AVC = AFC$
- At the shut-down price, the firm is indifferent between producing Q_4 and not producing at all, because either way it will have a loss equal to fixed costs.

(d) Loss in the short run and the shut-down price



Firm in loss when $AR < ATC$

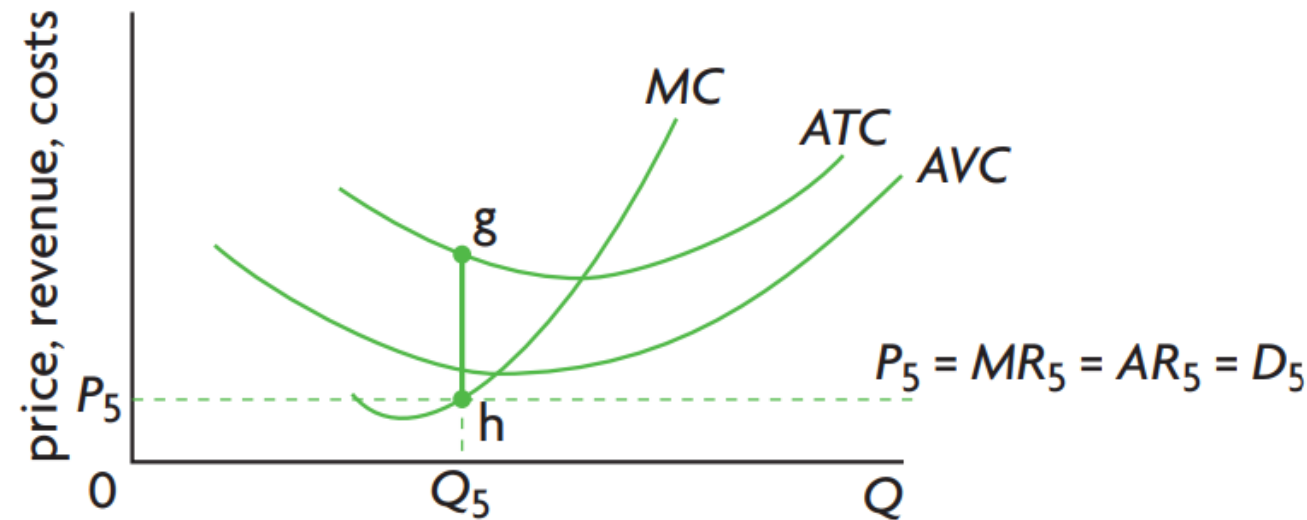
Step 1: Find $MR=MC$ for profit-maximizing (or loss-minimizing) level of output. $\rightarrow Q_5$

Step 2: Compare $AR (P)$ and AC to determine the amount of profit (loss) per unit of output. $\rightarrow AR(P) < ATC$; diff = gh (negative profit) loss

Step 3: find total loss $\rightarrow gh * Q_5 \rightarrow \text{Loss}$

- At Q_5 , the loss per unit is equal to the distance between points g and h , which is greater than AFC .
- If the price falls below the shut-down price, or below minimum AVC , the firm should shut down (stop producing).
- The firm is better off not producing at all, and its loss will equal to its fixed costs.

(e) The loss-making firm that will not produce



The shut-down price

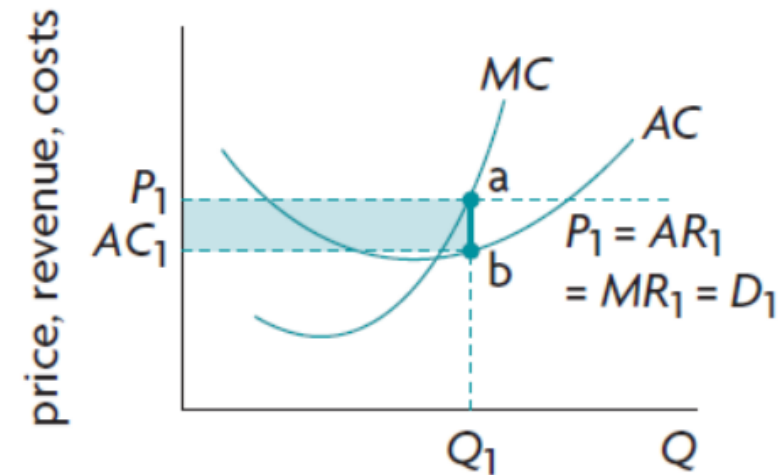
- **In short run**: the firm will continue to produce as long as the price is greater than minimum AVC, even though it may be making a loss.
 - In short run, a loss making firm still have to pay the fixed cost and cannot exit the industry.
 - It will shut-down when price $<$ minimum AVC
 - **In Long run**: the firm stops producing (leaves the industry) and shuts down when price falls below minimum ATC
 - It will shut-down when price $<$ minimum ATC
- P = minimum ATC is the lowest price that the firm would be willing to accept in order to remain in the business.

Short-run profit maximization in perfect competition

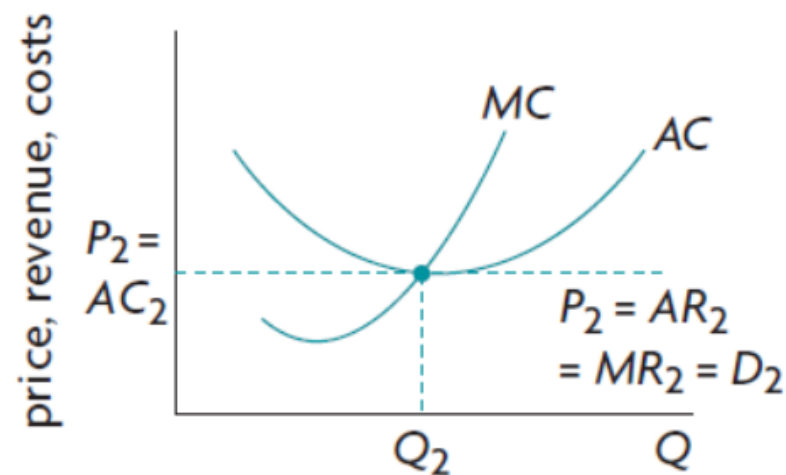
At the profit-maximizing level of output Q :

- If $AR > AC$ (or $P > AC$), the firm makes abnormal profit (positive profit)
- If $AR = AC$ (or $P = AC$), the firm makes normal profit (zero profit)
- If $AR < AC$ (or $P < AC$), the firm makes a loss (negative profit)

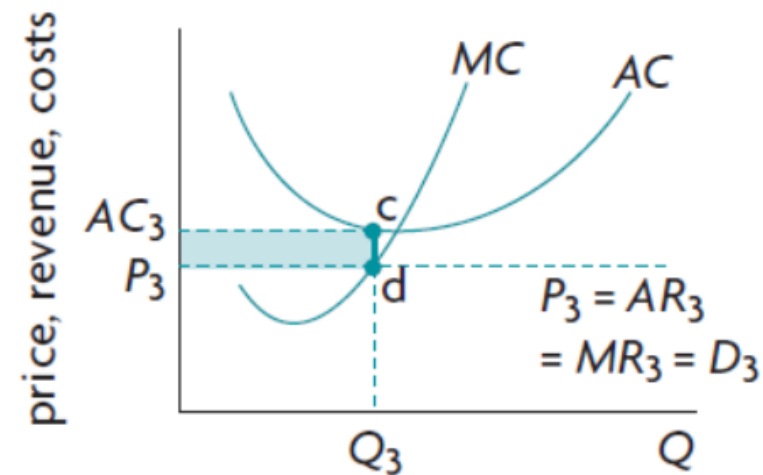
a Abnormal profit



b Normal profit



c Loss



- The firm will not offer any supply if the price falls below minimum AVC. Therefore, the firm's short-run supply curve is the **bold face segment of the MC curve** which begins at $P = \text{minimum AVC}$.
- The industry (market) supply curve is the sum of all individual firm MC curves above minimum AVC.

→ The **short-run supply curve** of the perfectly competitive firm is the portion of its marginal cost curve that lies above the point of minimum AVC.

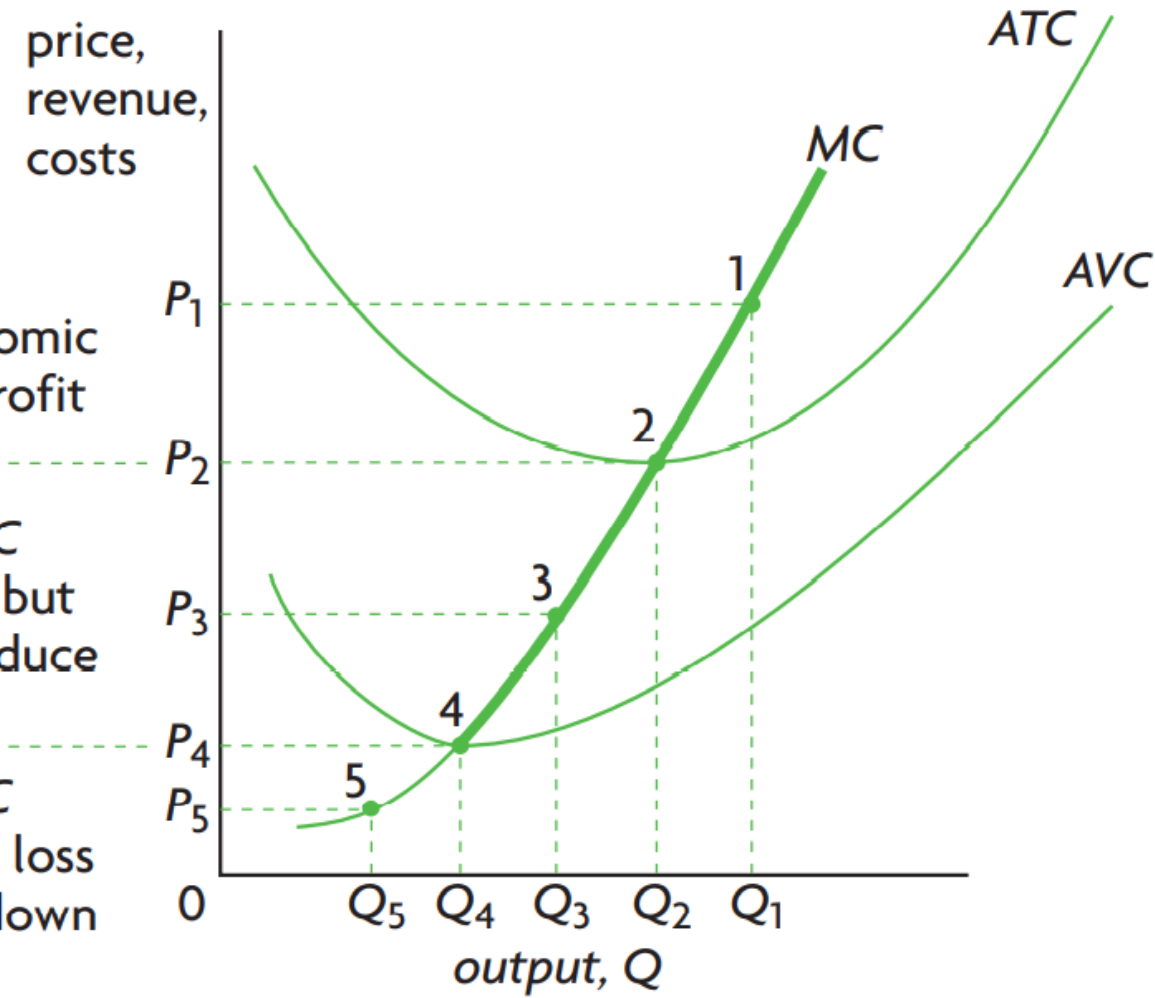
$P = \text{minimum ATC} = \text{break-even price}$
 firm makes normal profit,
 or zero economic profit

$P = \text{minimum AVC} = \text{shut-down price}$
 firm is indifferent between producing
 at a loss or not producing

$P > ATC$
 firm makes economic
 (supernormal) profit

$ATC > P > AVC$
 firm makes loss but
 continues to produce

$P < AVC$
 firm makes loss
 and shuts down



The break-even price

- The break-even price, or the price at which total revenues are exactly equal to total costs, occurs at the firm's break-even point.
- It is the **same for both the short run and the long run**, and is where **$P = \text{minimum ATC}$** .
- the firm earns normal profit.
- In the **long run**, the break-even price = shut-down price

Profit maximization in the long run

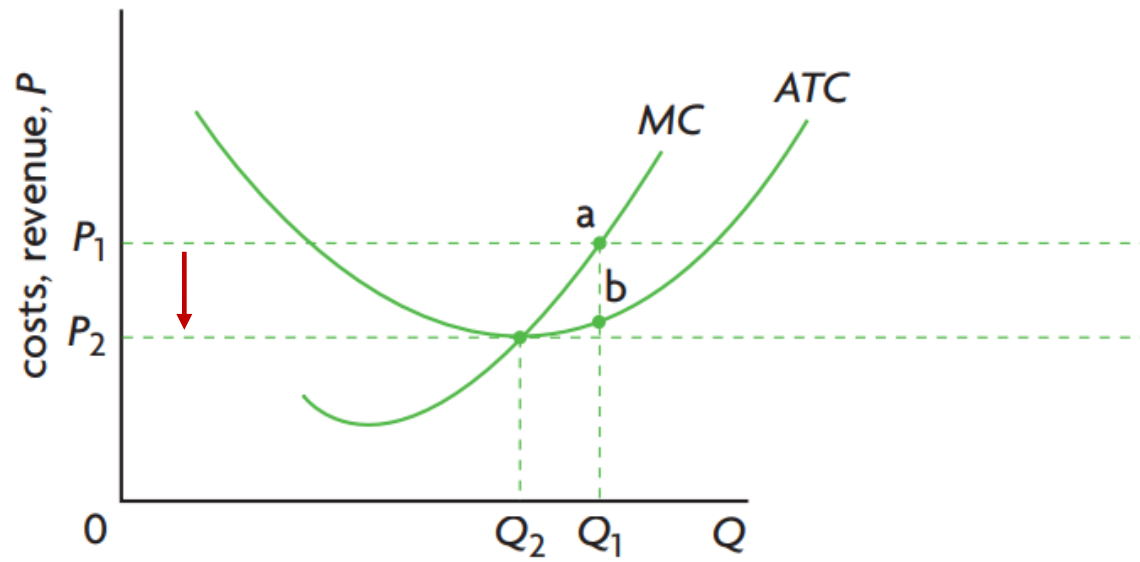
In the long run:

- All the firm's factors of production are variable.
- **Free entry of firms in an industry**
 - New firms can join the industry
 - Existing firms can change their size.
 - Existing firms can leave the industry.

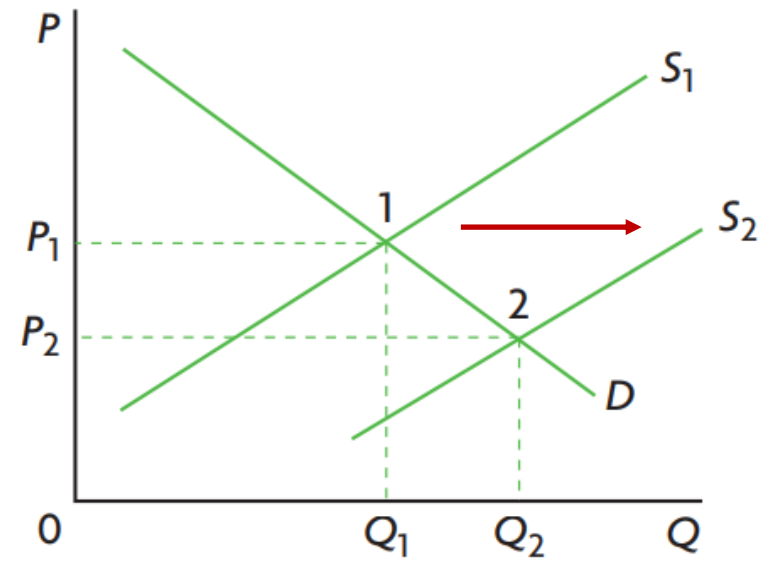
Abnormal profit in short run to normal profit in the long run

- For firms used to earn **abnormal profits** ($P > ATC$)
 - Original market equilibrium D and S_1 intersect with price P_1 .
 - Firms in the market produce output **Q_1** ($MC=MR$) and earn **abnormal profit $(a-b)/\text{unit}$** .
 - In the long run, **new firms are attracted into the industry** by the abnormal profit.
 - The industry **supply curve shift rightwards** from S_1 to S_2 , output $Q_1 \rightarrow Q_2$, it will reduce the price to P_2 until it is just equal to minimum ATC (AC).
- **$P=ATC(AC)$, break-even price, all the firms earning normal profit.**

(a) The firm



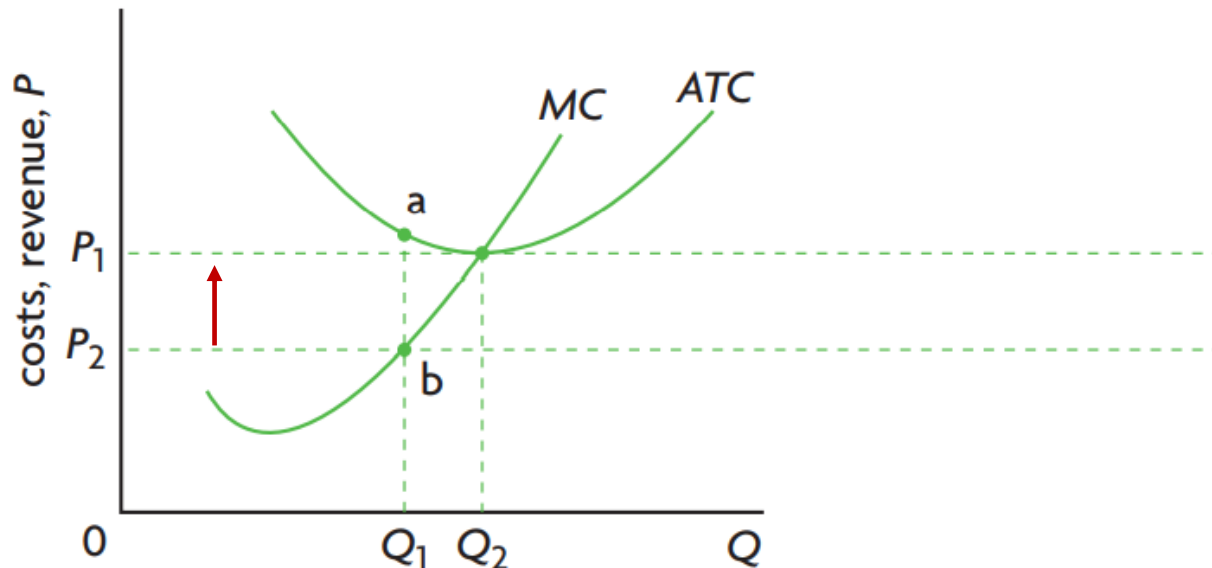
(b) The industry



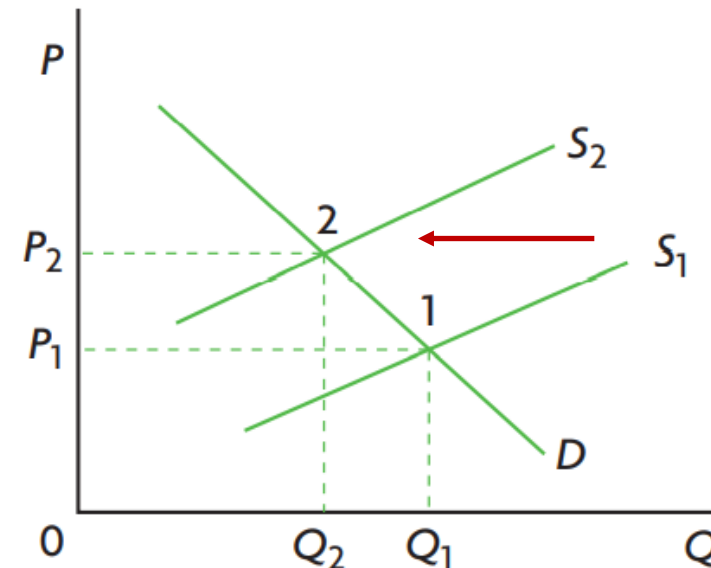
Negative profit in short run to normal profit in the long run

- For firms used to make a **loss** ($P < ATC$)
 - Original market equilibrium D and S1 intersect with price P1.
 - Firms in the market produce output **Q_1 ($MC=MR$)** and making a **loss of $(a-b)/\text{unit}$** .
 - In the long run, some firms would close down or switch to other industry.
 - The industry **supply curve shift leftwards** from S1 to S2, output $Q_1 \rightarrow Q_2$, it will raise the price to P2 until it is just equal to minimum ATC(AC).
- **$P=ATC(AC)$, break-even price, earning normal profit.**

(c) The firm



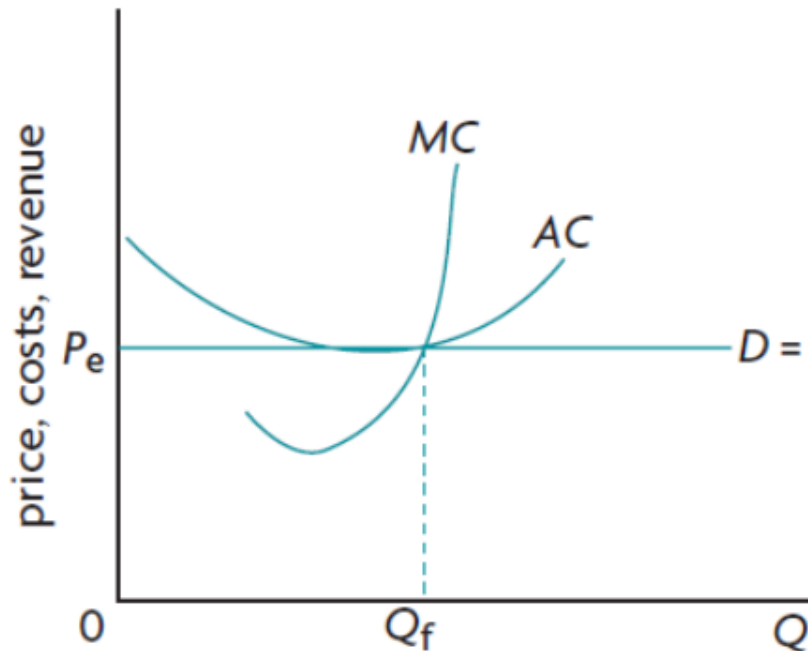
(d) The industry



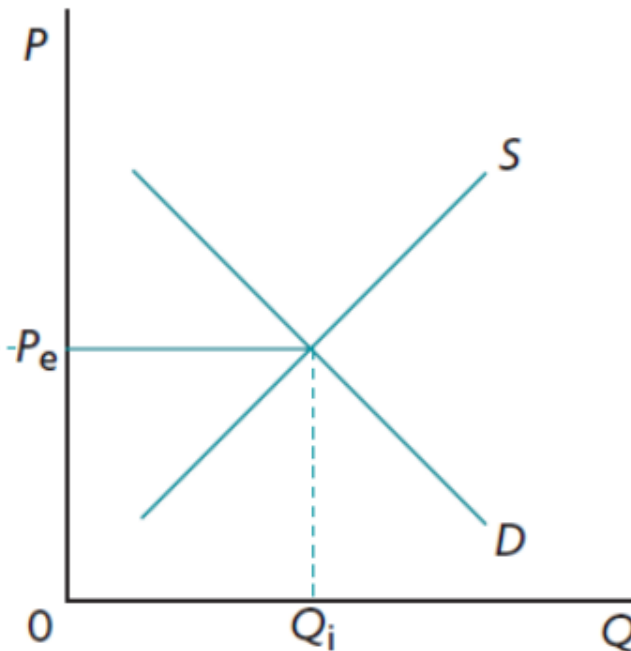
Profit maximization in the long run

- In the **long run equilibrium** of perfect competition, all firms earn normal profit (zero profit)
 - Each firm is producing in profit maximization point **$MC=AC$ with P_e and Q_f** .
 - The whole industry produces output Q_i .

a The firm



b The industry



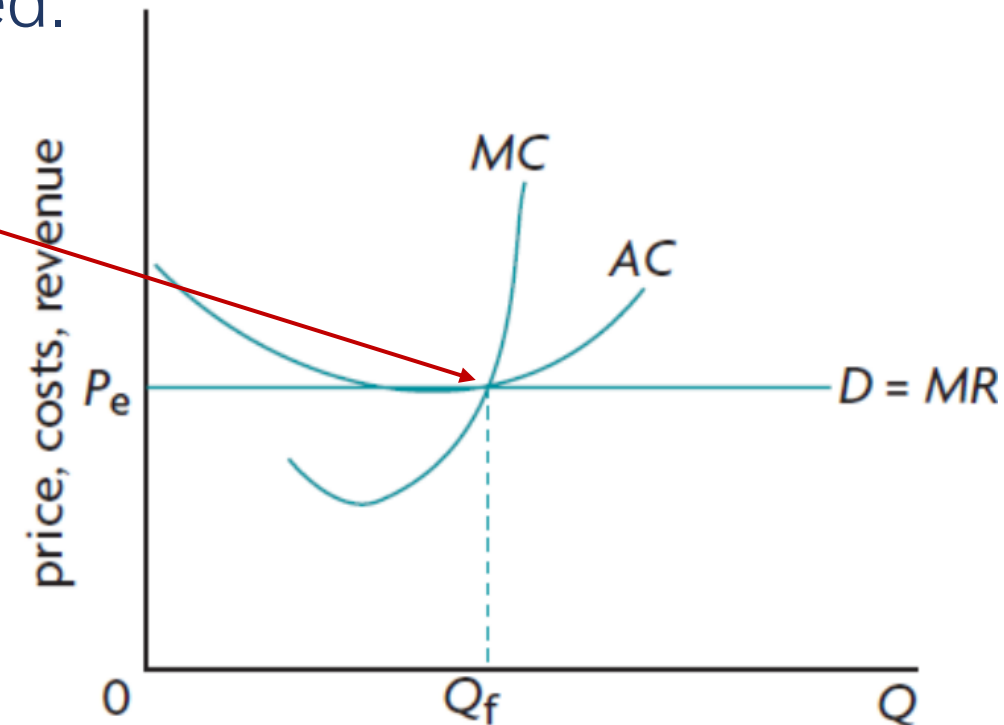
Productive efficiency

- **Productive(technical) efficiency** occurs when production takes place at the **lowest possible cost**.
- A **firm** is said to be **productively efficient** when it is producing at the lowest point on the short run average cost curve (this is the point where marginal cost meets average cost).
- **Measured in terms of the minimum ATC**
- At minimum ATC, the resources are being used economically and are not being wasted.
- Getting the most production from available resources

Productive efficiency in perfect competition

- In the long run equilibrium, the firm is producing Q_e with price P_e .
The firm is producing at the lowest point on average cost curve
- **Marginal cost = Average total cost**
- In the case of monopolistic competition, monopoly, oligopoly – productive efficiency is usually not achieved.

Production needs to occur **at the lowest point on The average total cost curve**



Allocative efficiency achieved at $MB=MC$ when Social Surplus is maximized.

Social
Surplus

=

Consumer
Surplus

+

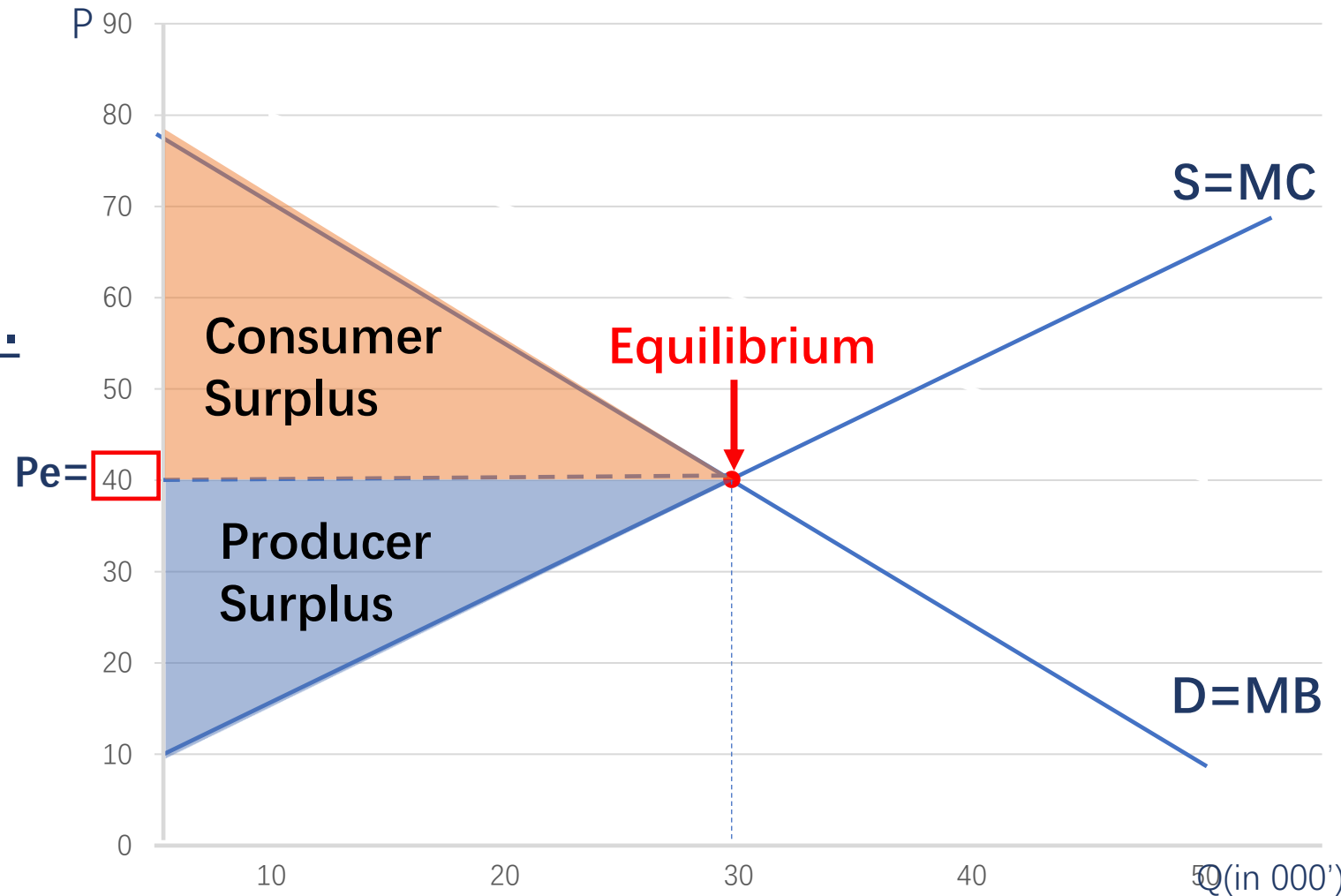
Producer
Surplus

At the point of competitive
market equilibrium, $MB=MC$

→ Allocative efficiency

→ Social welfare is maximum.

Society is making the best
possible use of its scarce
resources.



Allocative efficiency

at the level of the individual firms

- Allocative efficiency at the level of the **market**:
→ **MB = MC**
- Allocative efficiency at the level of the **individual firm**:
→ **P = MC**
- Allocative efficiency occurs when firms produce the particular combination of goods and services that consumers mostly prefer. Allocating the right amount of scarce resources to the production of **the right products**
- $P = MC = MB$
 - Price = Marginal benefit consumer derive from consumption of one more unit of the goods (the amount of money consumers are willing to pay to buy one more unit)
 - Marginal cost measures the value of the resources used to produce one extra unit of the good.
- If $P > MC$, underallocation of resources, more should be produced.
- If $P < MC$, overallocation of resources, less should be produced.

Allocative efficiency

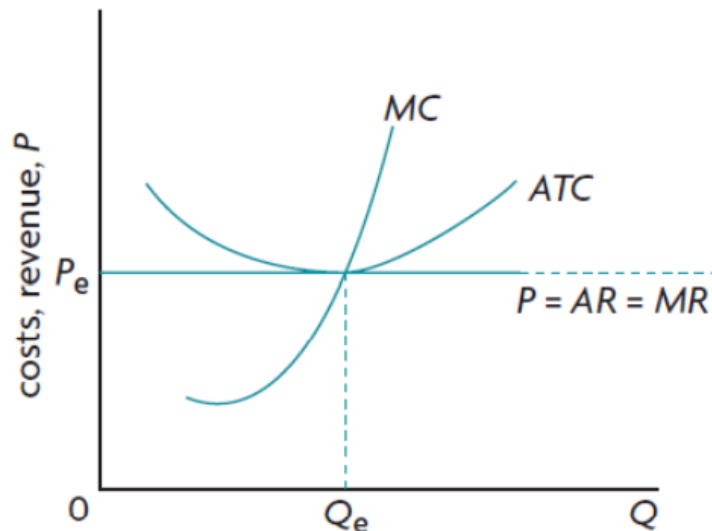
at the level of the individual firms

- **In short run equilibrium**, the perfect competitive firm achieves allocative efficiency but is unlikely to achieve productive efficiency (rarely).
- **In long-run equilibrium**, Perfect competition is the only market structure where productive efficiency and allocative efficiency occurs.

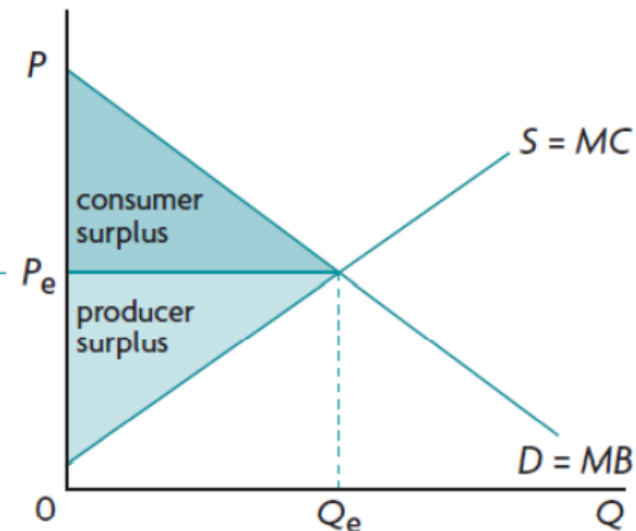
- The firm is earning normal profit, the perfect competitive firm achieves **allocative efficiency** where $P = MB = MC$.
- It also achieves **productive efficiency** where the production takes place at minimum ATC.

- The industry is achieving **allocative efficiency**
- $MC = MB$, Social surplus (CS + PS) maximum.

a The firm



b The market/industry



Evaluating perfect competition (AO3)

Advantages:

1. Allocative efficiency

- Best or 'optimal' allocation of resources
- Achieved through $P = MC$ in long-run equilibrium

2. Productive efficiency

- production at minimum ATC

3. Low prices for consumers

- a) Production at the lowest possible cost
- b) Absence of abnormal profits

4. Competition leads to the closing down of inefficient producers.

- less productive labour, outdated technologies, poor entrepreneurship, etc.

5. The market responds to consumer tastes.

6. The market responds to changes in technology or resource prices.

Evaluating perfect competition (AO3)

Disadvantages:

1. Unrealistic assumptions
2. Cannot take advantage of economies of scale (small firms)
3. Lack of product variety.
4. Waste of resources in the process of long-run adjustment.
 - continuous opening and closing of firms as the industry responds to changes in demand, resource prices and technology in the long run may lead to a waste of resources.
5. Limited ability to engage in new product development.
 - lack of abnormal profits
6. Market failure (externalities, common pool resources, etc.)