# Market Structures
# Partial Equilibrium and General Equilibrium Analysis

# The four types of Markets

- Perfect Competition
- Monopoly
- Oligopoly
- Monopolistic Competition

| | Perfect Competition | Monopolistic Competition | Oligopoly | Monopoly |
|---|---|---|---|---|
| Firms | Large number | Large Number | Small Number | One |
| Products | Identical | Differentiated | Similar. Differentiated | No close substitutes |
| Barriers to entry and exit | No barriers | Freedom of entry and exit | Some barriers to entry | Effective barriers to entry |
| Control over market price | No Control | Small Control | Substantial control | Significant control. |

# Perfect Competition

- A *perfectly competitive market* has the following characteristics:
  - There are many buyers and sellers in the market.
  - The goods offered by the various sellers are largely the same.
  - Firms can freely enter or exit the market.

# What is a competitive market?

- As a result of its characteristics, the perfectly competitive market has the following outcomes:
  - The actions of any single buyer or seller in the market have a negligible impact on the market price.
  - Each buyer and seller takes the market price as given.

# In a competitive firm

- Total revenue for a firm is the selling price times the quantity sold.

$$TR = (P \times Q)$$

Total revenue is proportional to the amount of output.

# Average Revenue = Price

$$\text{Average Revenue} = \frac{\text{Total revenue}}{\text{Quantity}}$$

$$= \frac{\text{Price} \times \text{Quantity}}{\text{Quantity}}$$

$$= \text{Price}$$

# Marginal Revenue

- *Marginal revenue* is the change in total revenue from an additional unit sold.

$$MR = \Delta TR / \Delta Q$$

# Revenue of a competitive firm

| *Quantity (Q)* | *Price (P)* | *Total revenue (TR = P X Q)* | *Average revenue (AR = TR/Q)* | *Marginal revenue (MR = ΔTR/ΔQ)* |
|---|---|---|---|---|
| 1 lawn | $20 | $ 20 | $20 | - |
| 2 | 20 | 40 | 20 | $20 |
| 3 | 20 | 60 | 20 | 20 |
| 4 | 20 | 80 | 20 | 20 |
| 5 | 20 | 100 | 20 | 20 |
| 6 | 20 | 120 | 20 | 20 |
| 7 | 20 | 140 | 20 | 20 |
| 8 | 20 | 160 | 20 | 20 |

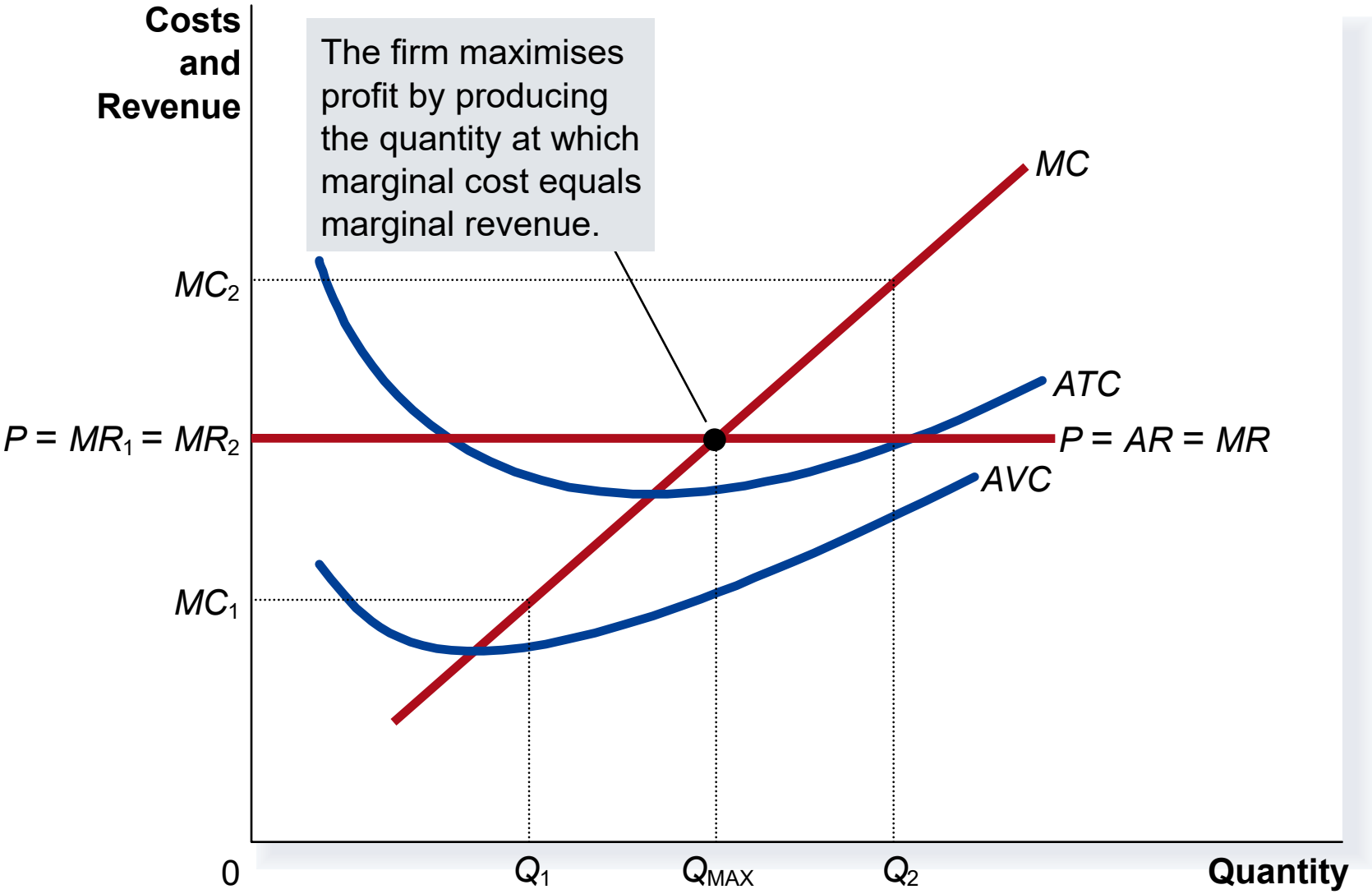
# Profit maximisation

- The goal of a competitive firm is to maximise profit.
- This means that the firm will want to produce the quantity that maximises the difference between total revenue and total cost.
- Marginal Revenue = Marginal Cost

# Profit maximisation

| *Quantity (Q)* | *Total revenue (TR)* | *Total cost (TC)* | *Profit (TR – TC)* | *Marginal revenue (MR = ΔTR/ΔQ)* | *Marginal cost (MC = ΔTC/ΔQ)* |
|---|---|---|---|---|---|
| 0 lawns | $ 0 | $ 10 | –$10 | - | - |
| 1 | 20 | 14 | 6 | $20 | $4 |
| 2 | 40 | 22 | 18 | 20 | 8 |
| 3 | 60 | 34 | 26 | 20 | 12 |
| 4 | 80 | 50 | 30 | 20 | 16 |
| 5 | 100 | 70 | 30 | 20 | 20 |
| 6 | 120 | 94 | 26 | 20 | 24 |
| 7 | 140 | 122 | 18 | 20 | 28 |
| 8 | 160 | 154 | 6 | 20 | 32 |

# Profit maximisation



# Profit maximisation

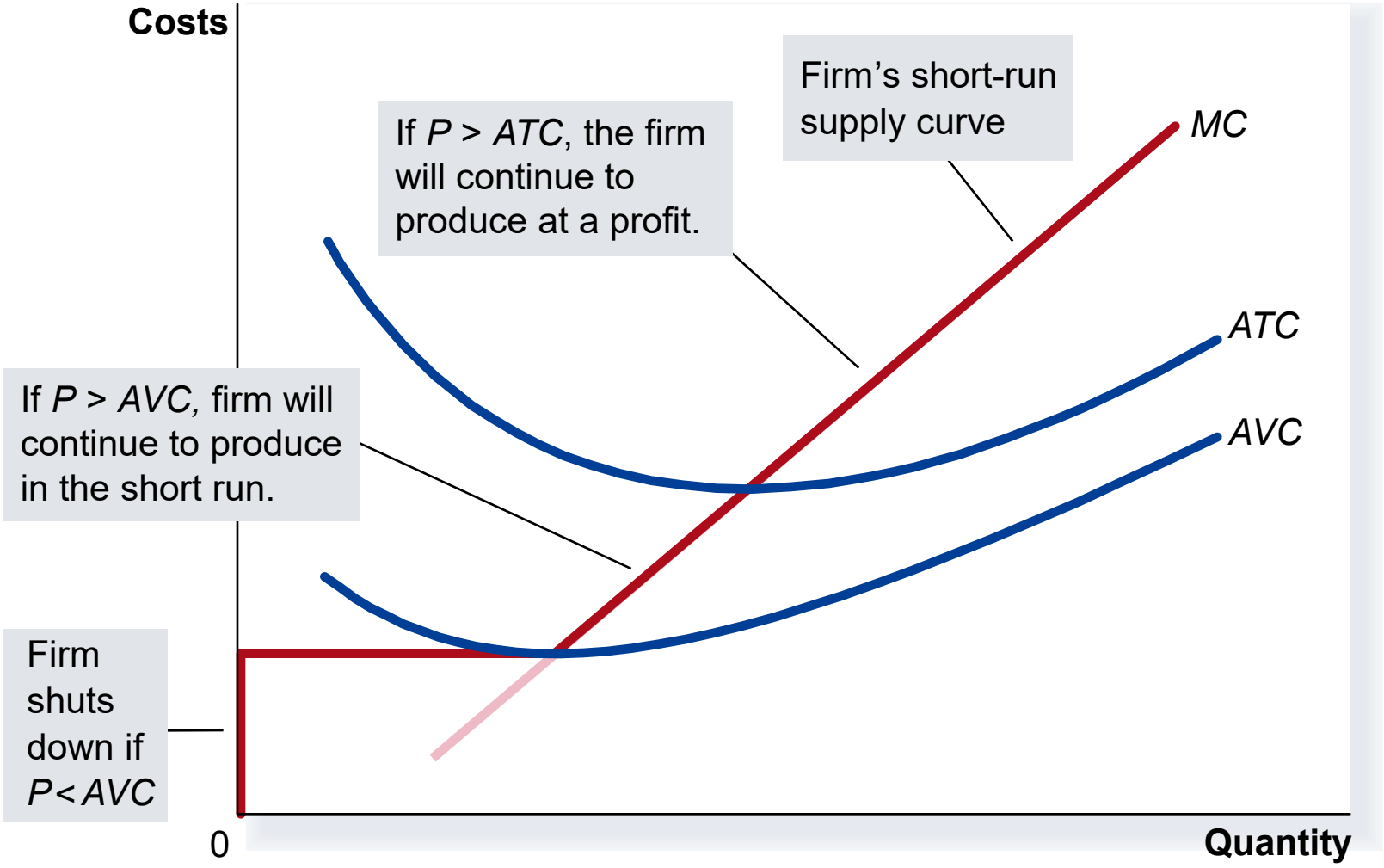
- When MR > MC, increase Q
- When MR < MC, decrease Q
- When MR = MC, profit is maximised

# To shut down or to exit?

Shut Down – Short run decision to not produce anything
Permanent exit – Long run decision to exit the market.
Most firms cannot avoid fixed costs in the short run

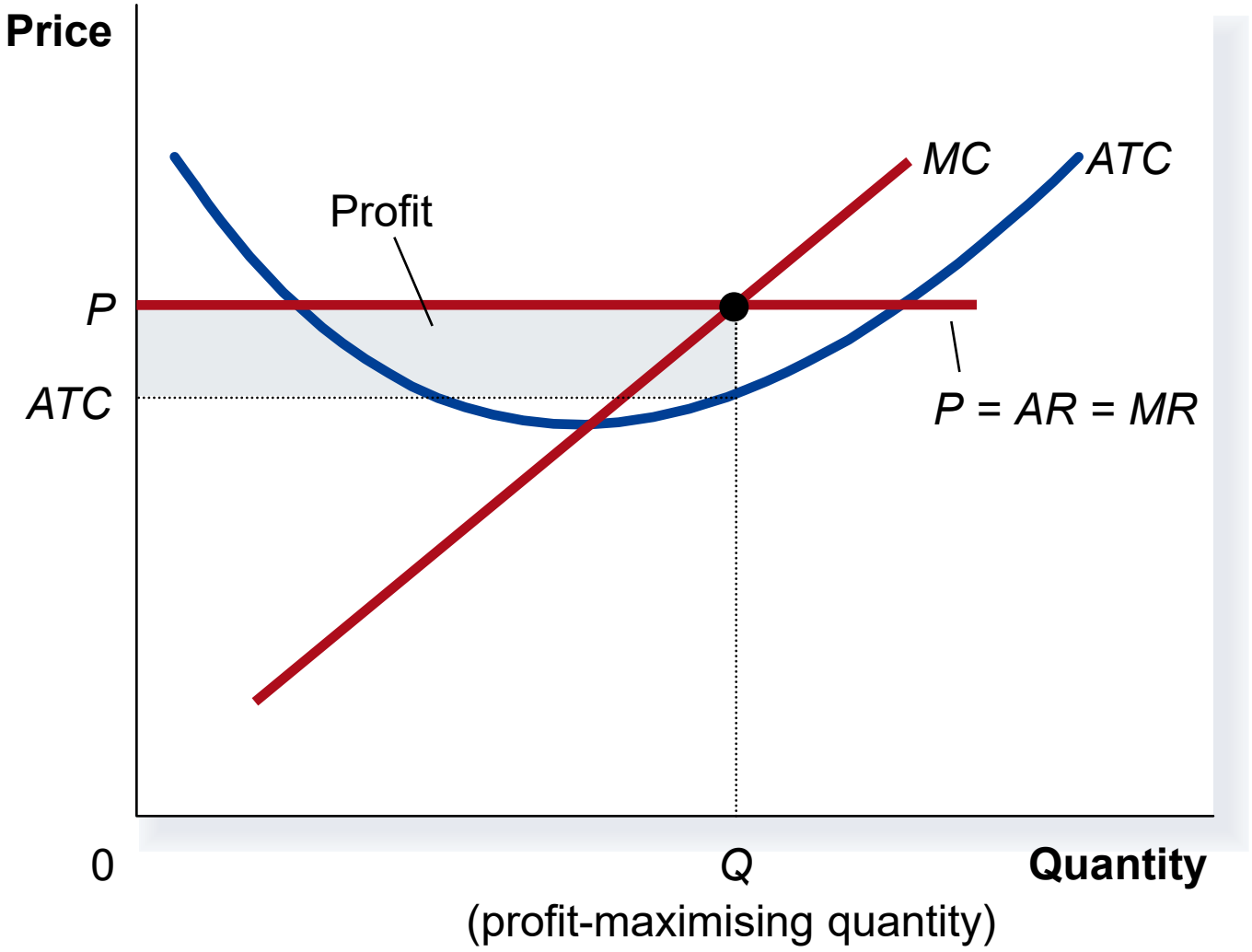
- **Firms Decision to Shut Down**
  - Total Revenue < Total Variable Cost
  - Price < Average Variable Cost
- **Firms Decision to Exit Permanently**
  - Total Revenue < Total Cost
  - Price < Average Total Cost
  - If this is the exit then
    - Price > ATC – is the entry

# The competitive firm's short run supply curve



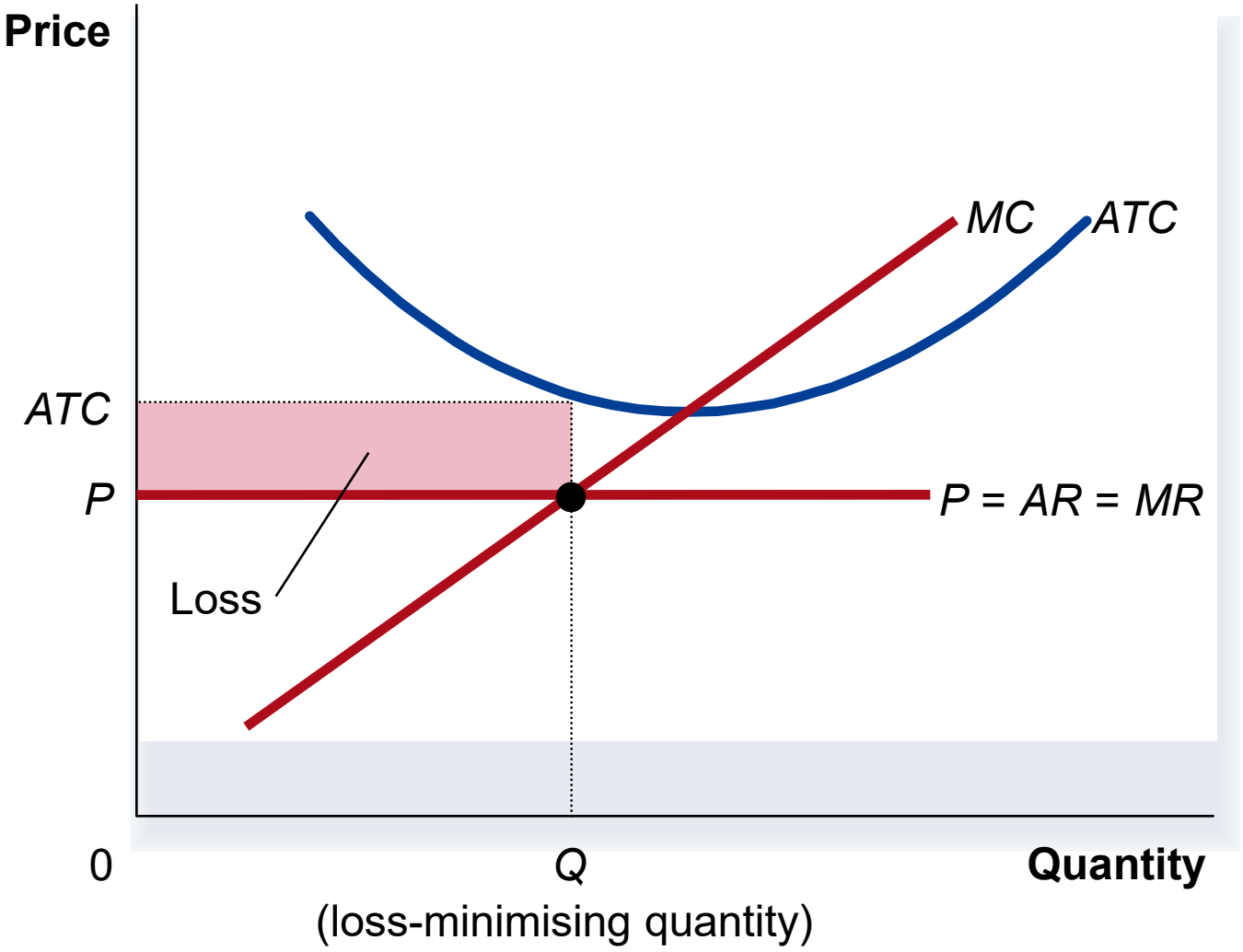
# Profit

**(a) A firm with profits**



# Loss

**(b) A firm with losses**



# The long run: Market supply with entry and exit

- Firms will enter or exit the market until profit is driven to zero.
- In the long run, price equals the minimum of average total cost.
- The long-run market supply curve is horizontal at this price.

# Competitive firms and zero profit

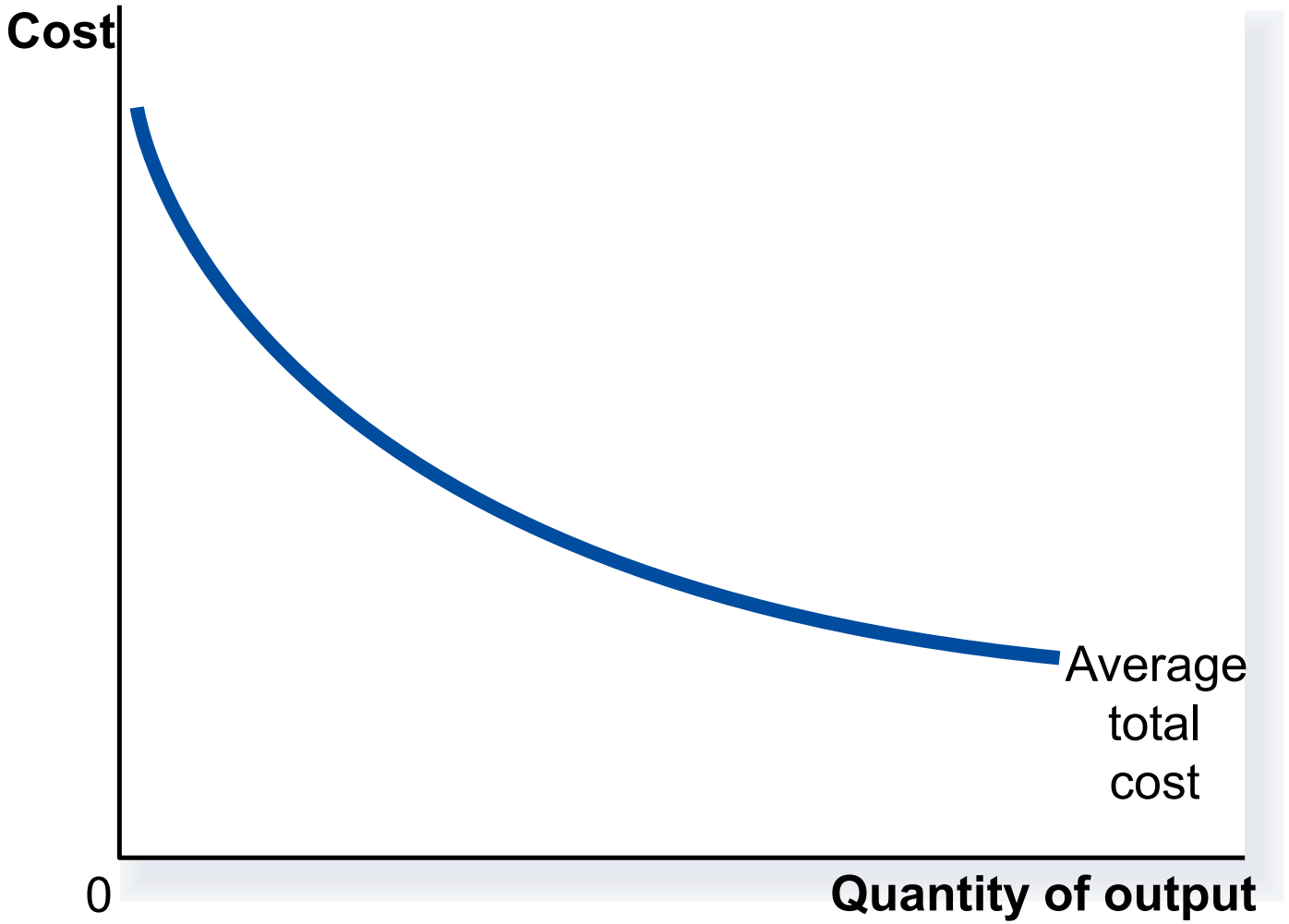
- Profit equals total revenue minus total cost.
- Total cost includes all the opportunity costs of the firm.
- In the zero-profit equilibrium, the firm's revenue compensates the owners for the time and money they expend to keep the business going.

# Monopoly

- A monopoly is a price maker
- Competitive market P=MC
- Monopoly P> MC
- The monopolist profit is not unlimited because of the demand curve

- Why monopolies arise
  - Simply its due to the barriers of entry
    - Monopoly resources – a key resource used for production is owned by one firm (Diamonds)
    - Government regulation – the government gives a single firm the right to produce some good or service (railways)
    - The production process – economies of scale so the costs are much lower in one firm over the others.

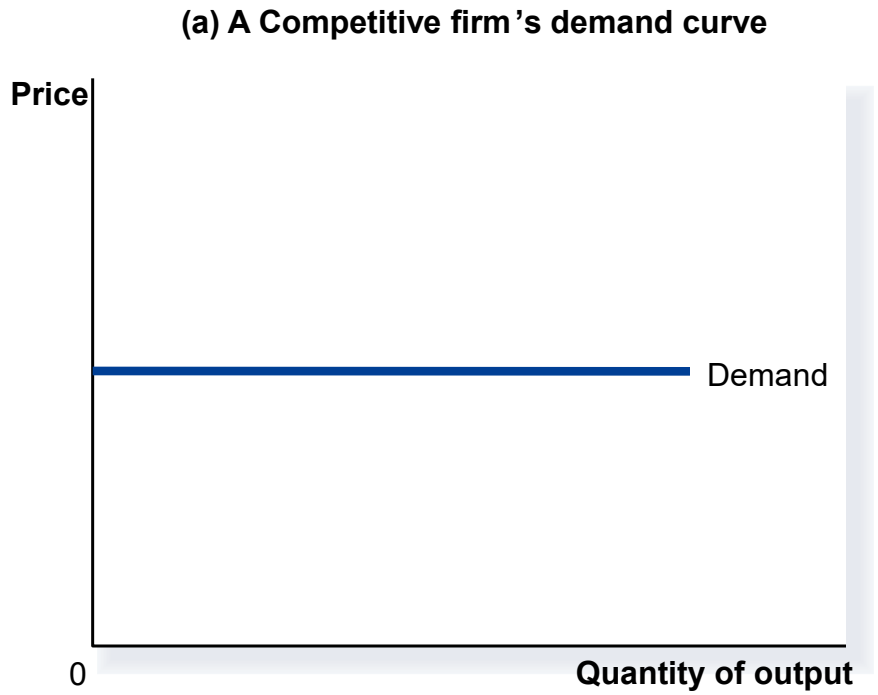
# Economies of scale as a cause of monopoly

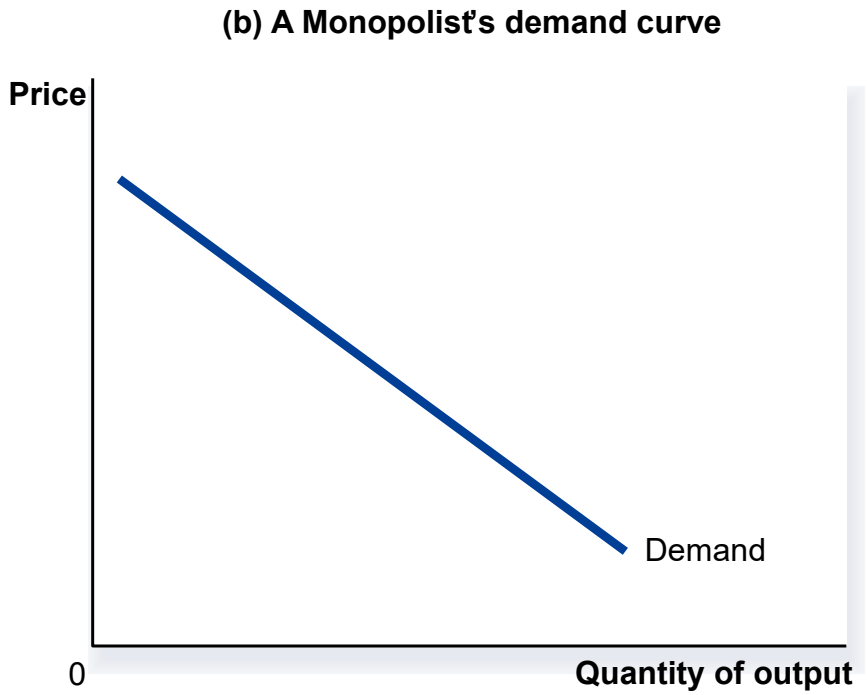


# Monopoly production and pricing decisions

- Monopoly
  - is the sole producer
  - faces a downward-sloping demand curve
  - is a price maker
  - reduces price to increase sales
- Perfect Competition
  - is one of many producers
  - faces a horizontal demand curve
  - is a price taker
  - sells as much or as little at same price

# Demand curves: Competitive and monopoly firms

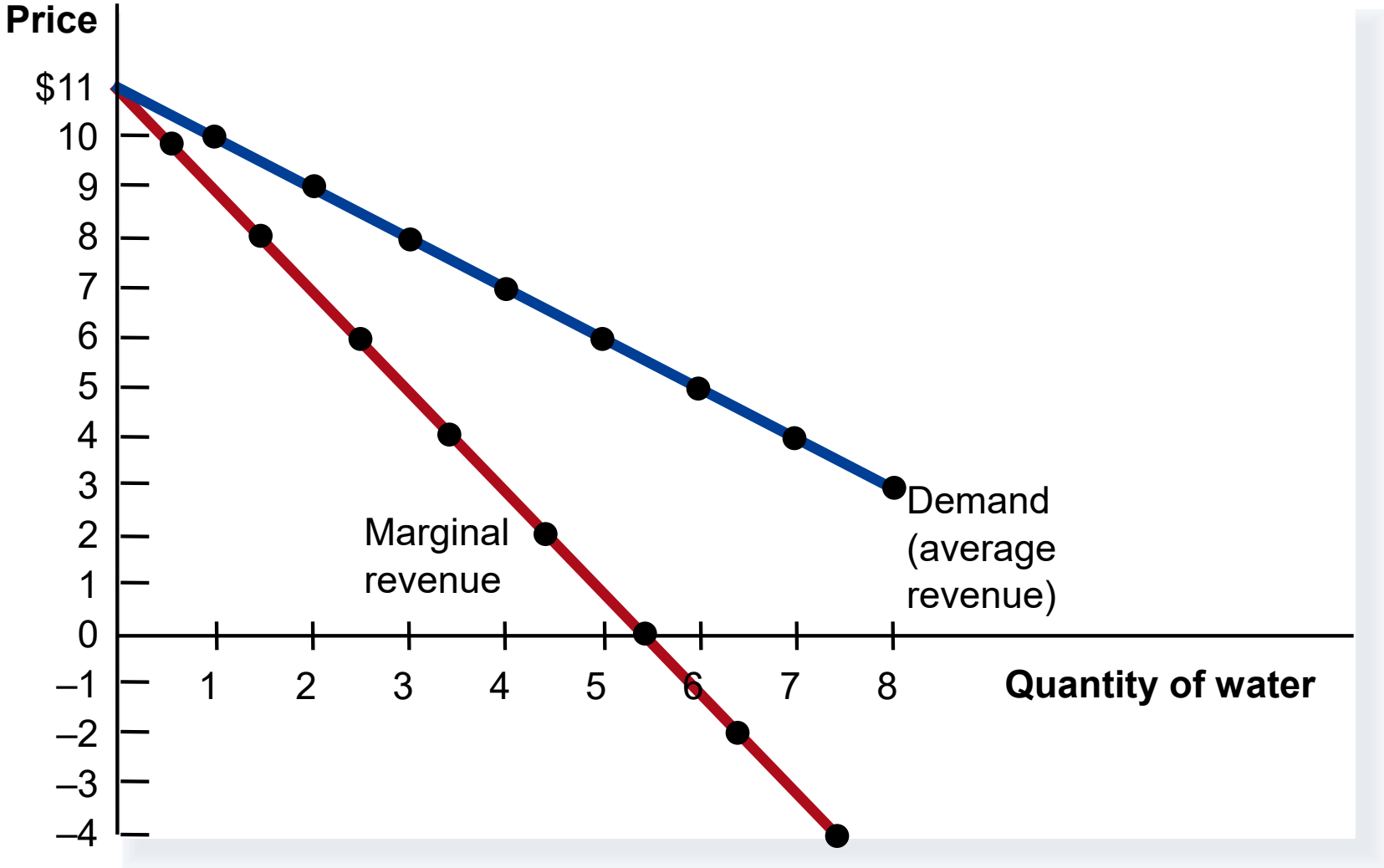


# A monopoly's revenue

| *Quantity of water* | *Price* | *Total revenue* | *Average revenue* | *Marginal revenue* |
|---|---|---|---|---|
| *(Q)* | *(P)* | *(TR = P X Q)* | *(AR = TR/Q)* | *(MR = DTR/DQ)* |
| 0 litres | $11 | $ 0 | — | — |
| 1 | 10 | 10 | $10 | $10 |
| 2 | 9 | 18 | 9 | 8 |
| 3 | 8 | 24 | 8 | 6 |
| 4 | 7 | 28 | 7 | 4 |
| 5 | 6 | 30 | 6 | 2 |
| 6 | 5 | 30 | 5 | 0 |
| 7 | 4 | 28 | 4 | –2 |
| 8 | 3 | 24 | 3 | –4 |

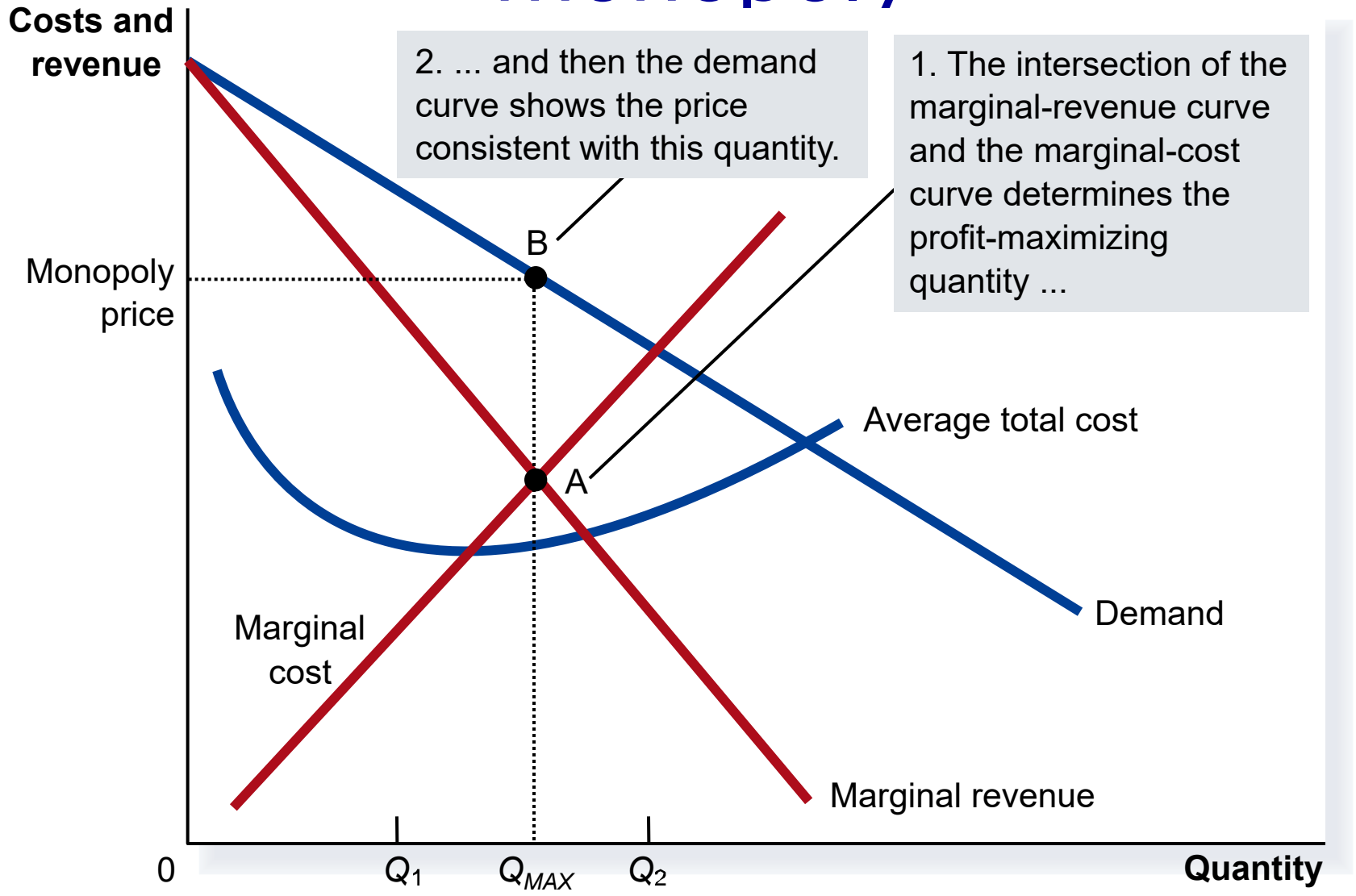
# Demand and marginal-revenue curves



# Profit maximisation

- A monopoly maximizes profit by producing the quantity at which marginal revenue equals marginal cost.
- It then uses the demand curve to find the price that will induce consumers to buy that quantity.

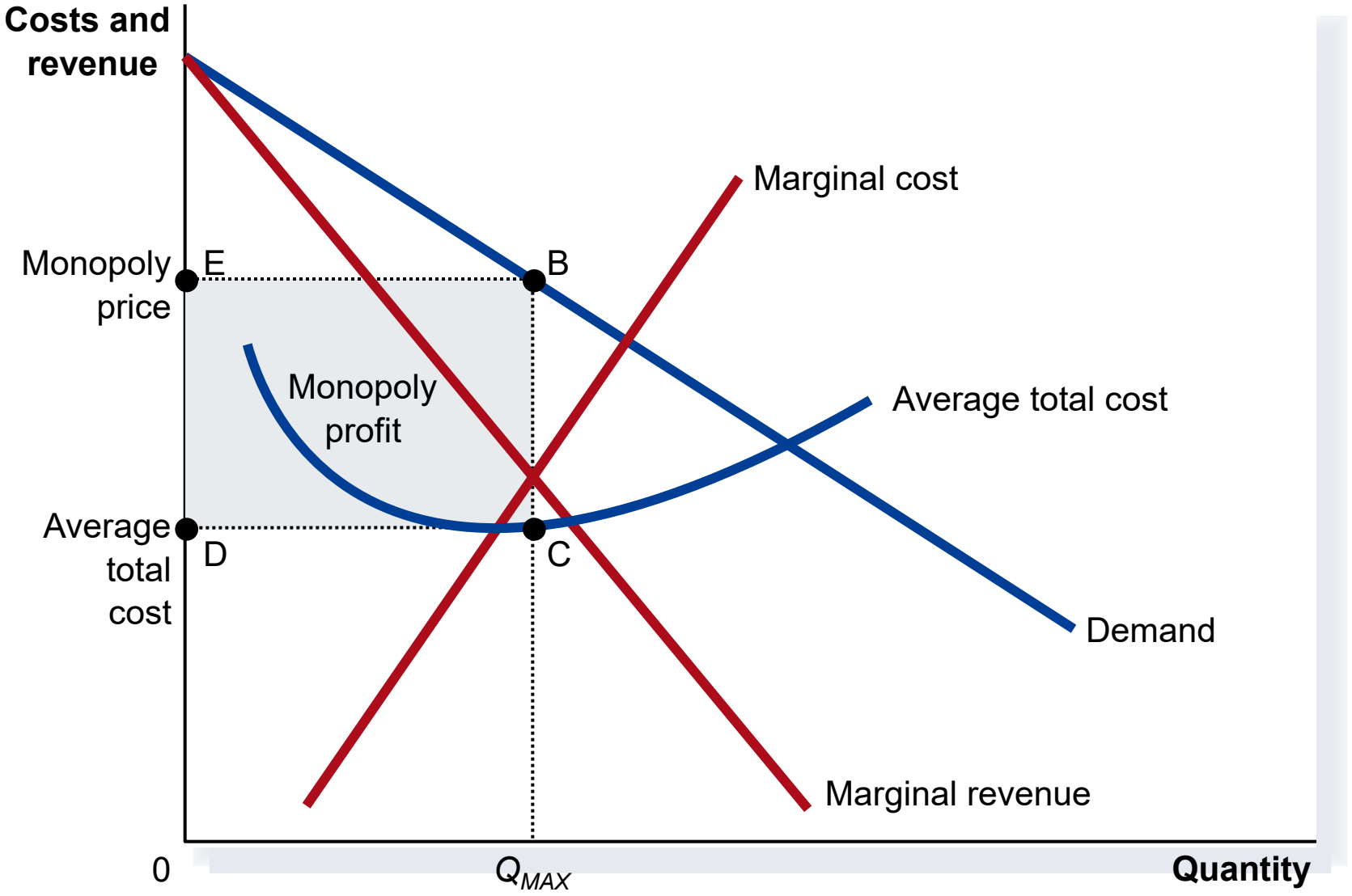
# Profit maximisation for a monopoly



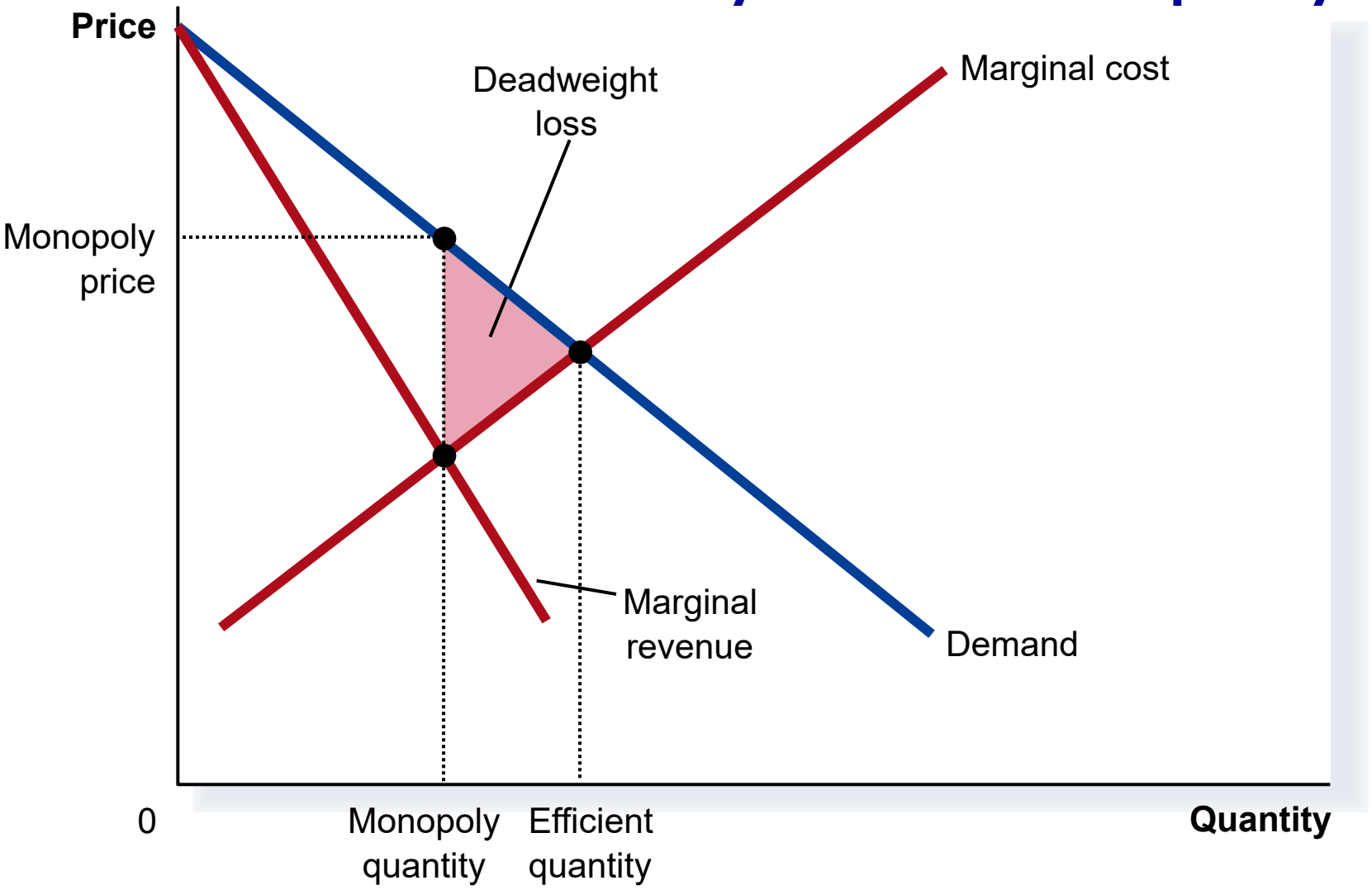
# A monopoly's profit

- Profit equals total revenue minus total costs.
  - Profit = $TR - TC$
  - Profit = $(TR/Q - TC/Q) \times Q$
  - Profit = $(P - ATC) \times Q$

# The monopoly's profit



# The inefficiency of monopoly



# The inefficiency of monopoly

- The monopolist produces less than the socially efficient quantity of output.

# Price discrimination

- *Price discrimination* is the business practice of selling the same good at different prices to different customers, even though the costs for producing for the two customers are the same.

# Price discrimination

- Examples of price discrimination
  - movie tickets
  - store brands
  - airline prices
  - discount coupons
  - quantity discounts

# Between monopoly and perfect competition

- Types of imperfectly competitive markets
  - *Oligopoly*
    - only a few sellers, each offering a similar or identical product to the others
  - *Monopolistic competition*
    - many firms selling products that are similar but not identical

# Monopolistic Competition

- A monopolistic competitive firm is inefficient. Average total cost is not at a minimum.
- There is a lot of information for the consumer to collect and process to make the best decisions.
- Advertising increases cost but advertising is essential to differentiate.

# Markets with only a few sellers

- Characteristics of an oligopoly market
  - Few sellers offering similar or identical products.
  - Interdependent firms.
  - Best off cooperating and acting like a monopolist by producing a small quantity of output and charging a price above marginal cost.

# The demand schedule for water

| *Quantity (in litres)* | *Price* | *Total revenue (and total profit)* |
|---|---|---|
| 0 | $120 | $ 0 |
| 10 | 110 | 1100 |
| 20 | 100 | 2000 |
| 30 | 90 | 2700 |
| 40 | 80 | 3200 |
| 50 | 70 | 3500 |
| 60 | 60 | 3600 |
| 70 | 50 | 3500 |
| 80 | 40 | 3200 |
| 90 | 30 | 2700 |
| 100 | 20 | 2000 |
| 110 | 10 | 1100 |
| 120 | 0 | 0 |

# A duopoly example

- Price and quantity supplied
  - The price of water in a perfectly competitive market would be driven to where the marginal cost is zero:
    - P = MC = $0
    - Q = 120 Litres
  - The price and quantity in a monopoly market would be where total profit is maximised:
    - P = $60
    - Q = 60 Litres

# A duopoly example

- Price and quantity supplied
  - The socially efficient quantity of water is 120 litres, but a monopolist would produce only 60 litres of water.
  - So what outcome then could be expected from duopolists?

# Competition, monopolies, and cartels

- The duopolists may agree on a monopoly outcome.
  - *Collusion* is an agreement among firms in a market about quantities to produce or prices to charge.
  - *Cartel* is a group of firms acting in unison.

# Other Price Policies in Oligopoly Markets

- Price Leadership
  - One firm is accepted as the price leader, the price leader will be the first to adjust prices
- Predatory Pricing
  - A large diverse firm that can stand temporary losses, will cut prices to run others out of business. (This is illegal)
- Price Fixing
  - Formal agreements (This is somewhat illegal too)
  - For example Cartels (OPEC)

# Game theory and the economics of cooperation

- *Game theory* is the study of how people behave in strategic situations.
- Strategic decisions are those in which each person, in deciding what actions to take, must consider how others might respond to that action.

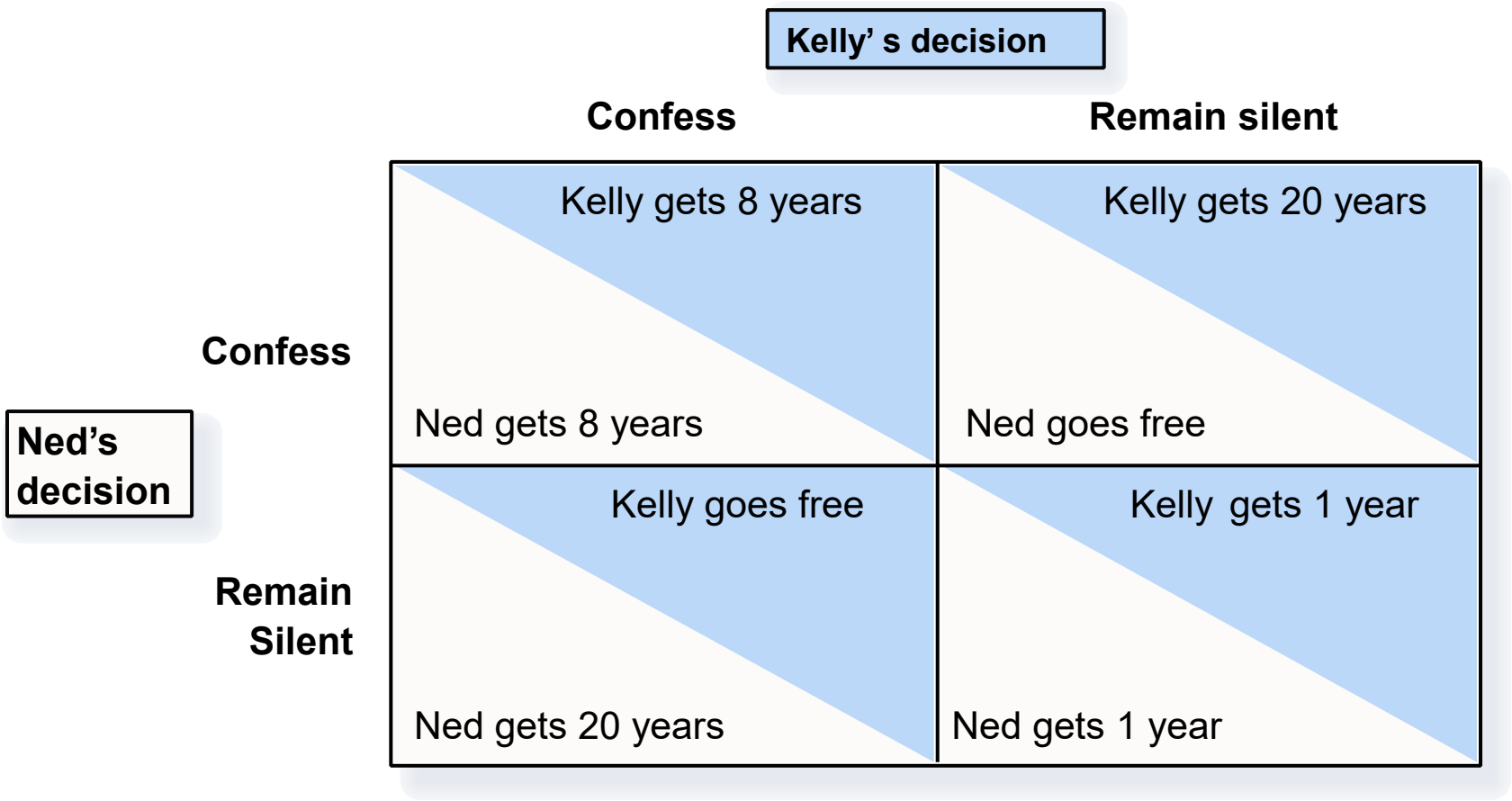
# Game theory and the economics of cooperation

- Because the number of firms in an oligopolistic market is small, each firm must act strategically.
- Each firm knows that its profit depends not only on how much it produces, but also on how much the other firms produce.

# The prisoners' dilemma

- The *prisoners' dilemma* provides insight into the difficulty in maintaining cooperation.
- Often people (of firms) fail to cooperate with one another even when cooperation would make them all better off.

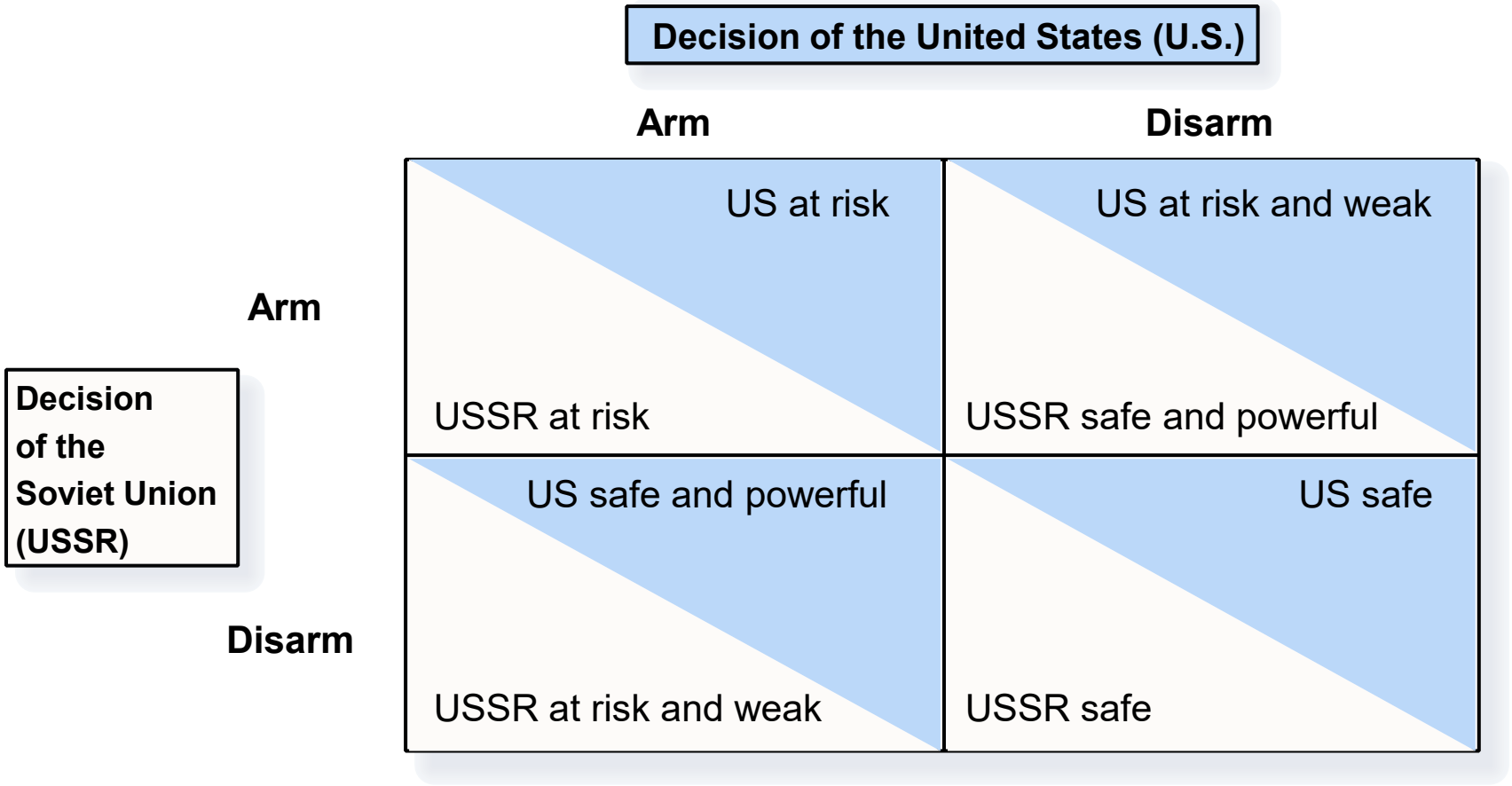
# The prisoners' dilemma



# The prisoners' dilemma

- The *dominant strategy* is the best strategy for a player to follow regardless of the strategies chosen by the other players.
- Cooperation is difficult to maintain, because cooperation is not in the best interest of the individual player.

# An arms-race game



# Partial Equilibrium and General Equilibrium Analysis

Equilibrium is a central concept in economic theory. It refers to a state in which economic forces such as demand and supply are balanced, and there is no inherent tendency for change.

To analyze how equilibrium prices and quantities are determined, economists have developed two major analytical frameworks: Partial Equilibrium Analysis and General Equilibrium Analysis. These approaches differ in their scope, assumptions, and applicability but together form the backbone of microeconomic analysis.

# Concept of Equilibrium in Economics

In economics, equilibrium denotes a situation where:

- Quantity demanded equals quantity supplied
- Market forces are in balance
- There is no incentive for buyers or sellers to change their behavior

Equilibrium can exist at the level of:

- An individual market (partial equilibrium)
- The entire economy (general equilibrium)

# Partial Equilibrium Analysis

**Meaning and Definition**

Partial equilibrium analysis studies the determination of price and output in **a single market**, assuming that all other markets and economic variables remain constant (*ceteris paribus*).

According to Alfred Marshall:

"Partial equilibrium analysis examines the equilibrium of a single industry in isolation."

**Origin and Development**

- Developed by **Alfred Marshall** in his book *Principles of Economics (1890)*
- Forms the basis of **Marshallian price theory**
- Emphasizes realism and practical applicabilit

**Assumptions of Partial Equilibrium**

Partial equilibrium analysis rests on the following assumptions:

1. Only one commodity or market is analyzed at a time
2. Prices of related goods remain constant
3. Consumer income and tastes are given
4. Technology and factor prices are constant
5. No feedback effects from other markets
6. Perfect competition in the market under study

**Price Determination under Partial Equilibrium**

The equilibrium price is determined at the point where the **demand curve** intersects the **supply curve**.

- At equilibrium price, quantity demanded equals quantity supplied
- If price is above equilibrium, excess supply emerges, leading to a fall in price
- If price is below equilibrium, excess demand arises, pushing price upward

This self-adjusting mechanism leads the market toward equilibrium.

**Stability of Partial Equilibrium**

A partial equilibrium is said to be stable if any deviation from the equilibrium price generates forces that restore equilibrium.

- Marshallian stability condition: demand curve must be more elastic than the supply curve at equilibrium

# General Equilibrium Analysis

**Meaning and Definition**

General equilibrium analysis studies the **simultaneous determination of prices and quantities in all markets** of the economy, recognizing their mutual interdependence.

According to Léon Walras:

"General equilibrium exists when all markets are in equilibrium simultaneously.

**Origin and Development**

- Developed by **Léon Walras**
- Known as **Walrasian General Equilibrium Model**
- Provides the foundation for modern microeconomic theory

**Assumptions of General Equilibrium**

The general equilibrium framework is based on the following assumptions:

1. Perfect competition in all markets
2. Rational consumers and producers
3. Given technology and factor endowments
4. Free mobility of factors of production
5. Complete information
6. Absence of externalities and public goods

**Structure of the General Equilibrium System**

General equilibrium considers:

- Goods markets
- Factor markets (land, labour, capital)
- Production decisions of firms
- Consumption decisions of households

Equilibrium exists when:

- All goods markets clear
- All factor markets clear
- Total demand equals total supply in the economy

**Attainment of General Equilibrium**

General equilibrium is attained through:

- Price adjustments in goods and factor markets
- Interaction between production and consumption
- Simultaneous equilibrium across all sectors

| Basis | Partial Equilibrium | General Equilibrium |
|---|---|---|
| Scope | Single market | Entire economy |
| Interdependence | Ignored | Fully considered |
| Complexity | Simple | Complex |
| Time period | Short run | Long run |
| Founders | Alfred Marshall | Léon Walras |

# Thank you