

Supply and Demand

AP Microeconomics

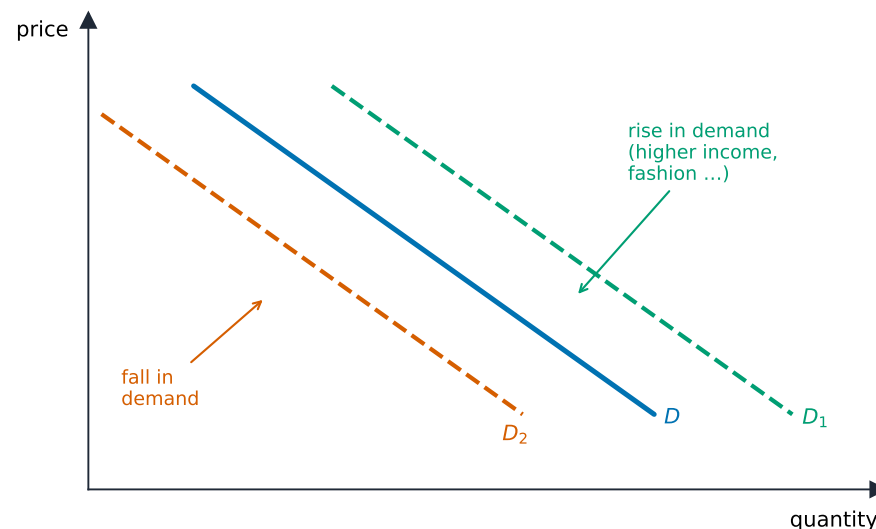
Demand



Shoppers in a market: demand shows how quantity demanded responds to price

A market works only where **property rights** 产权 are well defined – owners can use, exclude others from, and trade their resources; without them, prices cannot coordinate exchange. Within that framework, the two forces are demand and supply.

Demand 需求 is the relationship between the price of a good and the quantity buyers are willing and able to buy. The **law of demand** 需求定律 says price and quantity demanded move in **opposite** directions, so the demand curve slopes **downward**. Two reasons: the **substitution effect** 替代效应 (when a good gets pricier, buyers switch to alternatives) and the **income effect** 收入效应 (a higher price shrinks real purchasing power).



The demand curve slopes down; income, tastes, and related prices shift it

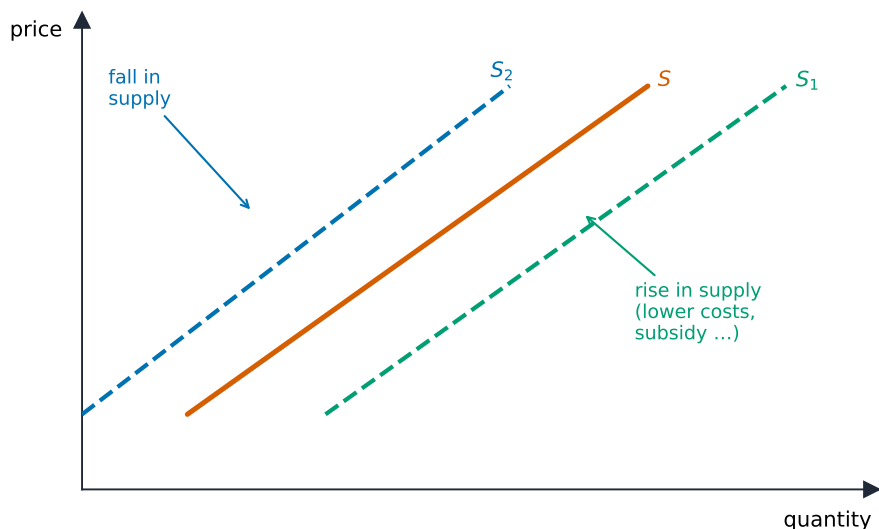
Distinguish a **change in quantity demanded** (a move *along* the curve, caused only by the good's **own price**) from a **change in demand** (a *shift* of the whole curve). Demand shifts with the **determinants** 决定因素, remembered as **TRIBE**:

- **Tastes/preferences**,
- **Related goods** – a rise in the price of a **substitute** 替代品 raises demand; a rise in the price of a **complement** 互补品 lowers it,
- **Income** – for a **normal good** 正常商品 more income raises demand; for an **inferior good** 低档商品 it lowers it,
- **Buyers** (number of consumers),
- **Expectations** of future price or income.

The **market demand curve** is the **horizontal summation** 水平相加 of every individual buyer's demand curve – at each price, add up the quantities all buyers want. That is why more buyers (the **B** above) shifts the whole market curve to the right.

Supply

Supply 供给 is the relationship between price and the quantity sellers will offer. The **law of supply** 供给定律: price and quantity supplied move in the **same** direction, so the supply curve slopes **upward** (higher prices cover higher marginal costs and reward more output).



The supply curve slopes up; costs, technology, tax, and subsidy shift it

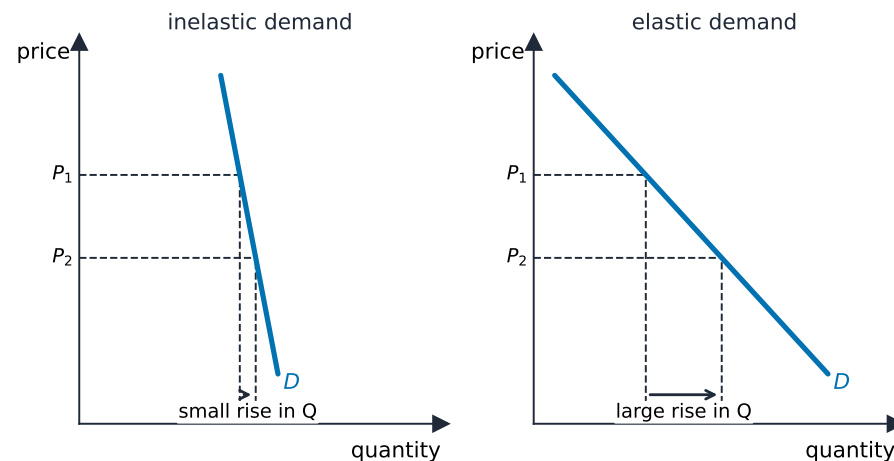
Again separate a **change in quantity supplied** (movement along the curve, from the good's own price) from a **change in supply** (a shift). Supply shifts with **input prices**, **technology**, taxes and **subsidies** 补贴, **prices of other goods** a firm could make, **number of sellers**, and **expectations**. Just like demand, the **market supply curve** is the horizontal sum of individual firms' supply curves – add the quantities all firms offer at each price – so more sellers shifts market supply to the right.

Exam skill: on the free-response section you must draw correctly labeled supply-and-demand graphs and shift the *right* curve in the *right* direction – decide first whether the event changes an “own price” (move along) or a determinant (shift).

Price Elasticity of Demand

Price elasticity of demand 需求价格弹性 measures how responsive quantity demanded is to a price change:

$$E_d = \left| \frac{\% \Delta \text{ quantity demanded}}{\% \Delta \text{ price}} \right|$$



Inelastic versus elastic demand: a small versus large response to a price change

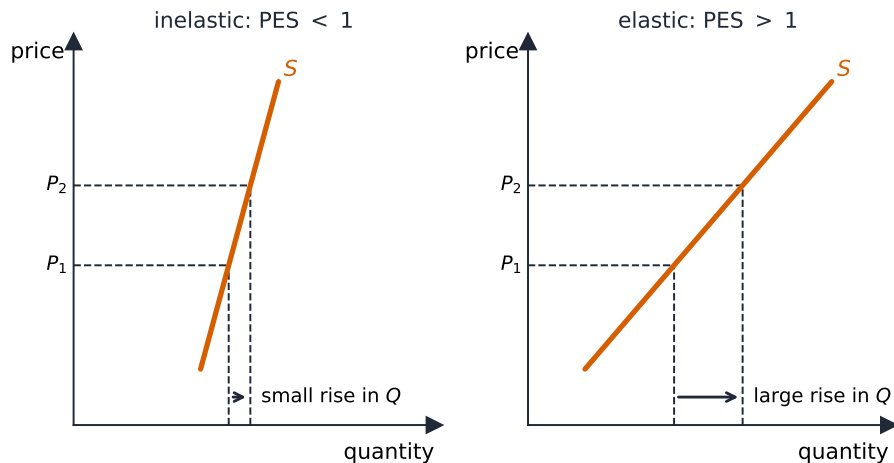
- $E_d > 1$: **elastic** 富有弹性 (quantity responds strongly);
- $E_d < 1$: **inelastic** 缺乏弹性 (quantity barely responds);
- $E_d = 1$: **unit elastic**.

Demand is more elastic when there are more **substitutes**, the good is a **luxury**, it takes a large share of income, or buyers have **more time** to adjust. Elasticity links to **total revenue** 总收入 ($P \times Q$): if demand is elastic, a price cut *raises* revenue; if inelastic, a price cut *lowers* it. Along a straight-line demand curve, elasticity falls as you move down (elastic on top, inelastic at the bottom).

Worked example. A price rise from \$10 to \$12 (a +20% change) cuts quantity demanded from 100 to 85 (a –15% change). Then $E_d = \left| \frac{-15\%}{20\%} \right| = 0.75 < 1$, so demand is **inelastic**. Because it is inelastic, the price rise *raises* total revenue: from $\$10 \times 100 = \1000 to $\$12 \times 85 = \1020 .

Price Elasticity of Supply

Price elasticity of supply 供给价格弹性, $E_s = \frac{\% \Delta Q_s}{\% \Delta P}$, measures how responsive sellers are. Supply is more elastic when firms can adjust output easily – spare capacity, storable goods, and above all **more time** (supply is more elastic in the long run than the short run).

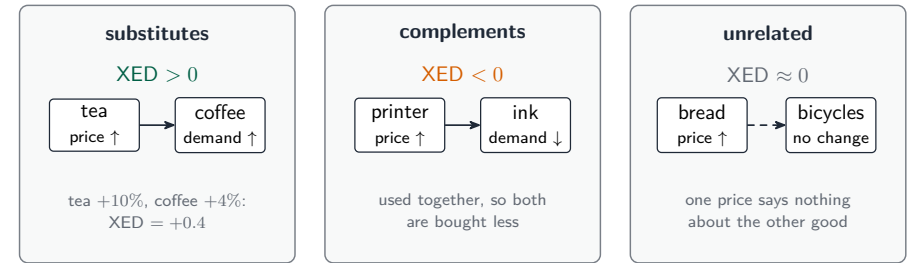


The same price rise gives a small supply response when PES is below 1, a large one above 1

Other Elasticities

- **Cross-price elasticity** 交叉价格弹性 $= \frac{\% \Delta Q_x}{\% \Delta P_y}$: **positive** for substitutes, **negative** for complements – the sign tells you the relationship.
- **Income elasticity** 收入弹性 $= \frac{\% \Delta Q}{\% \Delta \text{income}}$: **positive** for normal goods (and > 1 for luxuries), **negative** for inferior goods.

Worked example. When the price of coffee rises 10%, the quantity of tea demanded rises 6%: cross-price elasticity $= \frac{+6\%}{+10\%} = +0.6$. The **positive** sign confirms coffee and tea are **substitutes**. If instead a 5% rise in incomes raised restaurant-meal demand 10%, income elasticity $= \frac{10\%}{5\%} = +2$ – a normal good, and a **luxury** since it exceeds 1.

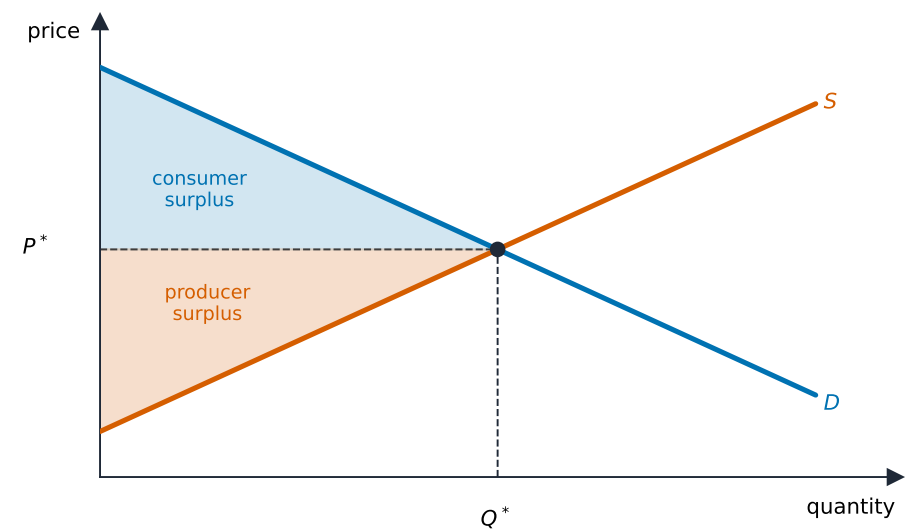


Cross elasticity: positive for substitutes, negative for complements

Exam skill: you are expected to compute an elasticity, classify it, and read a *sign* as evidence of substitute/complement or normal/inferior.

Market Equilibrium, Consumer Surplus, and Producer Surplus

Equilibrium 均衡 is where supply meets demand: the **equilibrium price** clears the market, so quantity demanded equals quantity supplied and there is no shortage or surplus.



Consumer surplus and producer surplus at the market equilibrium

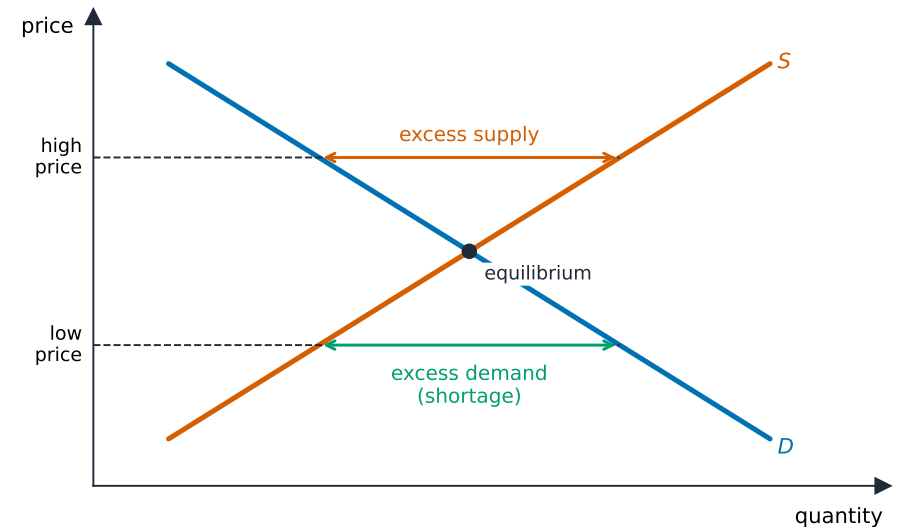
- **Consumer surplus** 消费者剩余 is the area **below the demand curve and above the price** – the gap between what buyers would pay and what they do pay.
- **Producer surplus** 生产者剩余 is the area **above the supply curve and below the price** – the gap between the price and sellers' minimum acceptable price.
- Their sum is **total surplus** 总剩余, and the competitive equilibrium **maximizes** it – this is why free markets are called **allocatively efficient** 配置有效率.



A real market: many buyers and sellers meet, and price settles where the quantity wanted equals the quantity offered

Market Disequilibrium and Changes in Equilibrium

Away from equilibrium the market self-corrects: above the equilibrium price there is a **surplus** 过剩 (excess supply) that pushes price down; below it a **shortage** 短缺 (excess demand) that pushes price up.

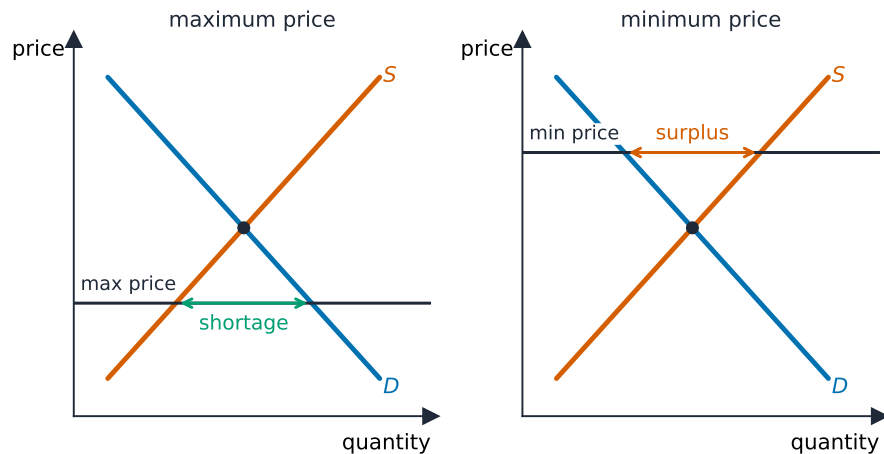


Above equilibrium there is excess supply; below it, excess demand

When a determinant shifts a curve, the equilibrium moves predictably. A **single** shift gives a definite result for both price and quantity. When **both** curves shift, one of price or quantity is **indeterminate** (depends on the relative sizes of the shifts) – a favorite exam trap. Work these out by drawing the shifts.

The Effects of Government Intervention in Markets

Governments intervene, usually reducing total surplus:



A price ceiling causes a shortage; a price floor causes a surplus

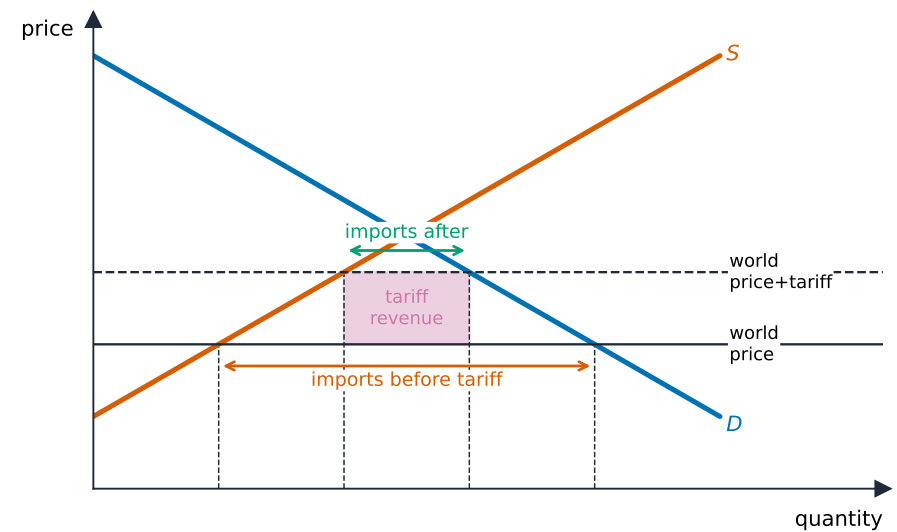
- A **price ceiling** 价格上限 (a legal maximum, like rent control) below equilibrium causes a persistent **shortage**.
- A **price floor** 价格下限 (a legal minimum, like a minimum wage) above equilibrium causes a persistent **surplus**.
- An **excise tax** 消费税 shifts supply up by the tax; the burden (**tax incidence** 税收归宿) falls more heavily on whichever side is **more inelastic**.
- A **subsidy** shifts supply down, raising quantity.

Each of these creates **deadweight loss** 无谓损失 – mutually beneficial trades that no longer happen, shown as a triangle between the curves at the new quantity.

Exam skill: on a graph, be able to shade consumer surplus, producer surplus, government revenue from a tax, and deadweight loss, and say who bears the tax and why.

International Trade and Public Policy

When a country opens to trade at a **world price** 世界价格:



A tariff raises domestic supply, cuts demand, and shrinks imports

- If the world price is **below** the domestic price, the country **imports** 进口 – consumers gain more than producers lose, so total surplus rises.
- If the world price is **above** the domestic price, the country **exports** 出口 – producers gain more than consumers lose.

A **tariff** 关税 (a tax on imports) or a **quota** 配额 (a limit on imports) raises the domestic price, helps domestic producers, hurts consumers more, and creates deadweight loss. Free trade maximizes total surplus, which is the core efficiency argument for it.

Exam tips

- Separate a **movement along** a curve (own price) from a **shift** (a determinant); a single shift gives a definite result, a double shift leaves one variable indeterminate.
- Compute elasticity $E_d = |\% \Delta Q \div \% \Delta P|$; elastic (> 1) means a price cut raises total revenue, inelastic (< 1) lowers it.
- Read the sign of cross-price elasticity (substitutes +, complements –) and income elasticity (normal +, inferior –).

- Shade **consumer/producer surplus** and the **deadweight loss** from a tax or price control; incidence falls on the more **inelastic** side.
- A price ceiling below equilibrium causes a shortage; a price floor above causes a surplus.