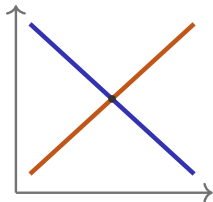


Supply and Demand

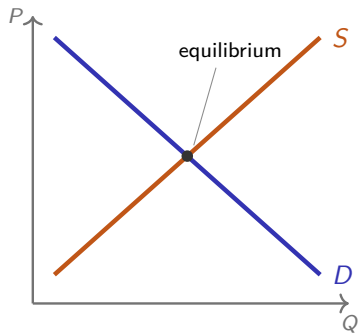
AP Microeconomics ■ Unit 2

AP Microeconomics



What we will cover

- 1 Demand & supply
- 2 Elasticity (PED & PES)
- 3 Cross-price & income elasticity
- 4 Equilibrium & surplus
- 5 Price controls & taxes
- 6 International trade



The law of demand

Demand 需求 is the whole price–quantity relationship; **quantity demanded** 需求量 is one point on it.

- price up $\Rightarrow$ quantity down
(**inverse** 反向关系)
- **substitution effect** 替代效应: switch to cheaper goods
- **income effect** 收入效应: your money buys less



Buyers respond when prices change

Movement vs shift

Movement along 沿曲线移动

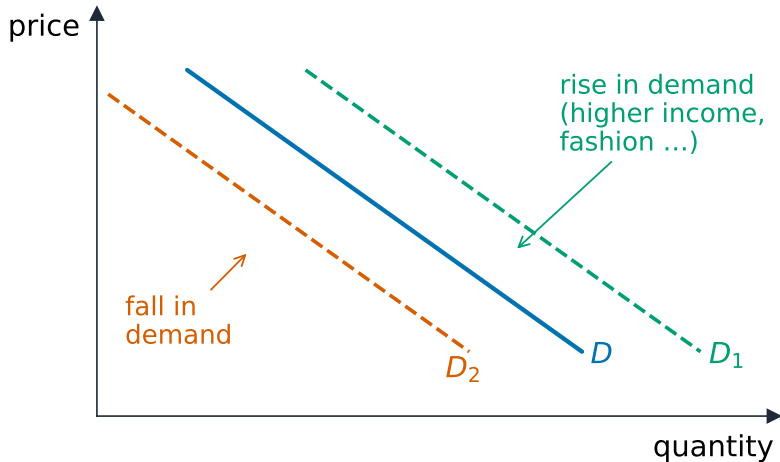
only the good's **own price**
changed – slide to another point

Shift 移动

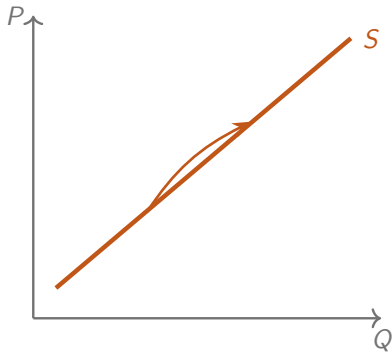
something **else** changed –
whole curve moves left/right

TIPEN shifts demand: **Tastes** 偏好, Income, Prices of related goods
(**substitutes** 替代品/**complements** 互补品), Expectations, Number of buyers.

Movement vs shift



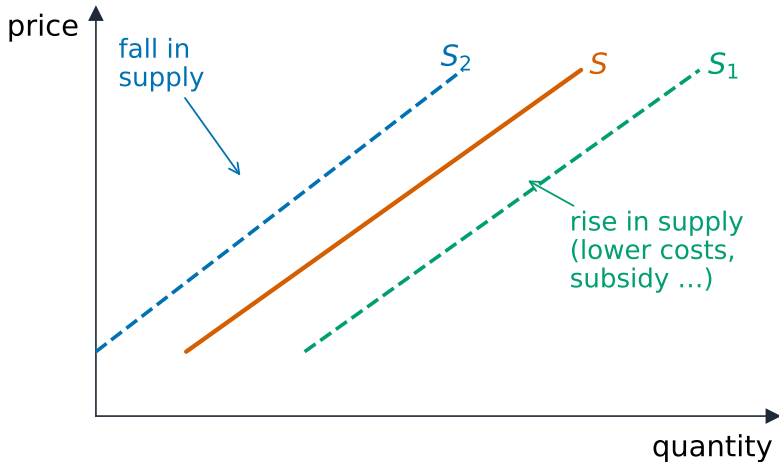
The law of supply



Supply 供给: price up $\Rightarrow$ quantity up (a **direct relationship** 正向关系). The curve slopes up because each extra unit adds **marginal cost** 边际成本.

TITEN shifts supply: **Technology** 技术, Input prices, Taxes/**subsidies** 补贴, Expectations, Number of sellers.

The law of supply



Price elasticity of demand

PED 需求价格弹性 = $\frac{\% \Delta Q_d}{\% \Delta P}$ – how strongly quantity responds to price. Use the **midpoint method** 中点法 and read $|PED|$.

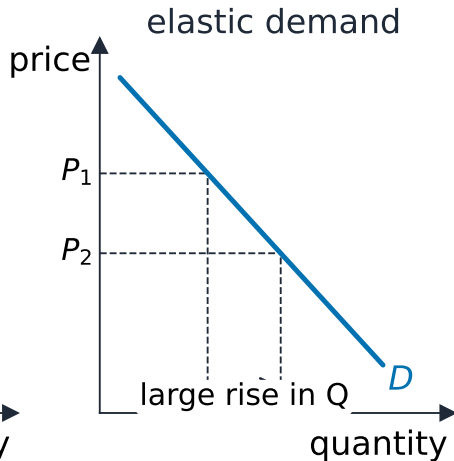
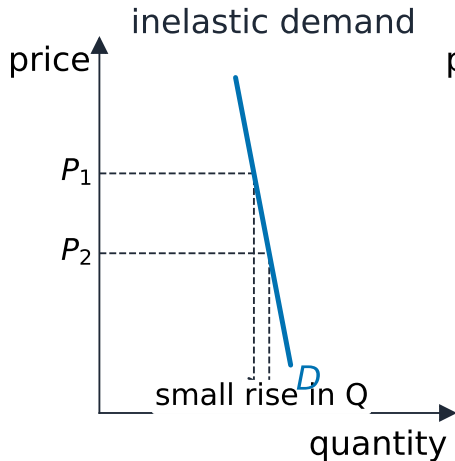
Elastic
 $|PED| > 1$

Unit elastic
 $|PED| = 1$

Inelastic
 $|PED| < 1$

More elastic when: many substitutes, a large share of income, more **time** 时间 to adjust.

Price elasticity of demand



The total revenue test

$TR = P \times Q$. When you change price, elasticity decides whether revenue rises.

Elastic

price & TR move **opposite**

cut price $\rightarrow$ TR up

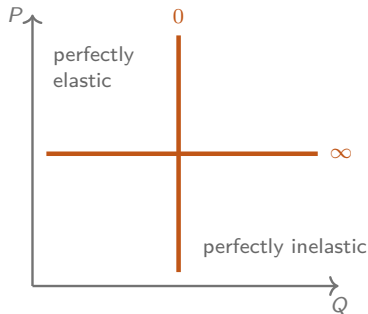
Inelastic

price & TR move **together**

raise price $\rightarrow$ TR up

On a straight-line demand curve the **upper** half is elastic, the **midpoint** is unit elastic, the **lower** half inelastic. TR is greatest at the midpoint.

Price elasticity of supply

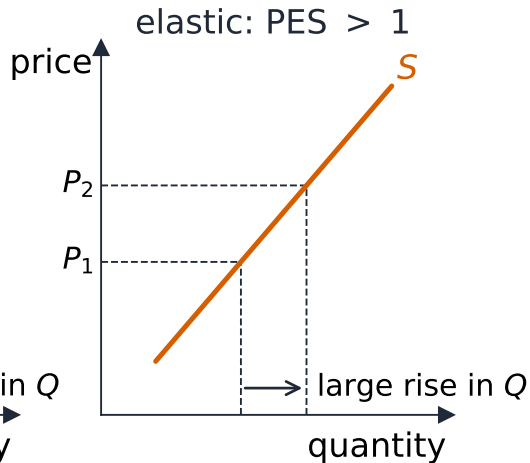
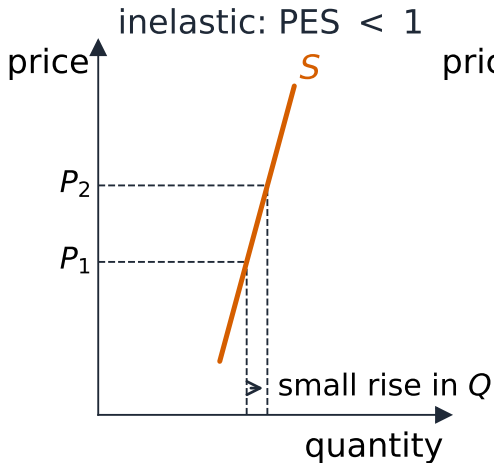


PES 供给价格弹性 = $\frac{\% \Delta Q_s}{\% \Delta P}$ (positive).

- > 1 elastic, < 1 inelastic
- horizontal S: **perfectly elastic** 完全弹性 (∞)
- vertical S: **perfectly inelastic** 完全无弹性 (0)

More elastic with more **time** 时间跨度 and **spare capacity** 闲置产能.

Price elasticity of supply



Cross-price & income elasticity

$$\text{XED 交叉价格弹性} = \frac{\% \Delta Q_X}{\% \Delta P_Y}$$

+ $\Rightarrow$ substitutes -
 $\Rightarrow$ complements

$$\text{YED 收入弹性} = \frac{\% \Delta Q}{\% \Delta \text{income}}$$

+ $\Rightarrow$ **normal good** 正常商品
- $\Rightarrow$ **inferior good** 低档商品

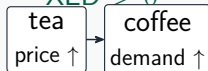
Worked example

Income rises 10%; bus-ticket demand falls 5%. $\text{YED} = \frac{-5\%}{10\%} = -0.5$ – negative, so bus travel is an **inferior good**.

Cross-price & income elasticity

substitutes

$$XED > 0$$

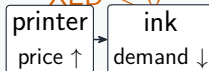


tea +10%, coffee +4%:

$$XED = +0.4$$

complements

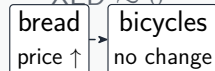
$$XED < 0$$



used together, so both
are bought less

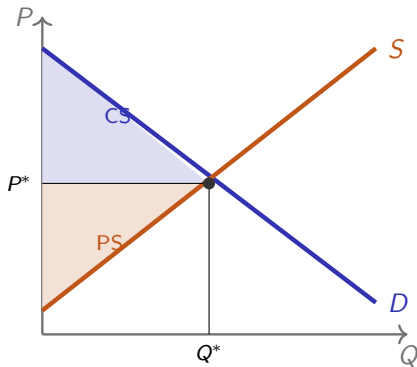
unrelated

$$XED \approx 0$$



one price says nothing
about the other good

Equilibrium, consumer & producer surplus



Equilibrium 均衡: where D meets S ;
 $Q_d = Q_s$.

- **consumer surplus** 消费者剩余: below D , above P^*
- **producer surplus** 生产者剩余: above S , below P^*

Total surplus is largest here – **allocative efficiency** 配置效率, where $MB = MC$.

Worked example – surplus

Solve for equilibrium and surplus

Demand $P = 20 - Q$, supply $P = 2 + Q$. Set equal: $20 - Q = 2 + Q \Rightarrow Q = 9$, $P = \$11$.

Consumer surplus $= \frac{1}{2} \times 9 \times (20 - 11) = \40.50 .

Producer surplus $= \frac{1}{2} \times 9 \times (11 - 2) = \40.50 .

Total surplus $= \$81$.

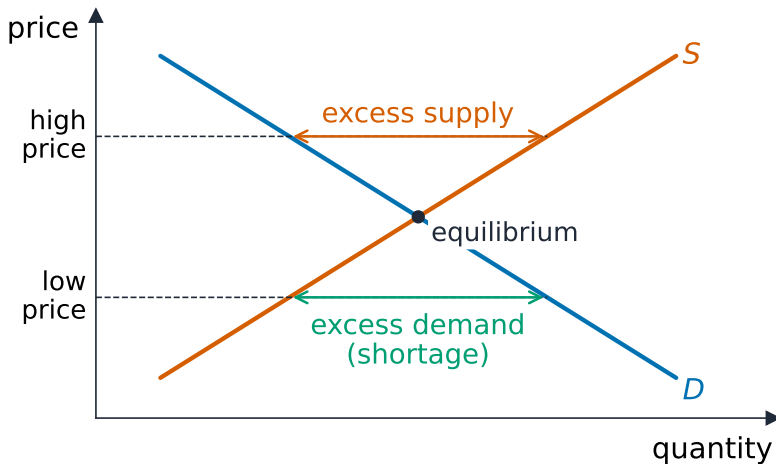
Disequilibrium & shifts

Price too high $\Rightarrow$ surplus 过剩 $\rightarrow$ price falls

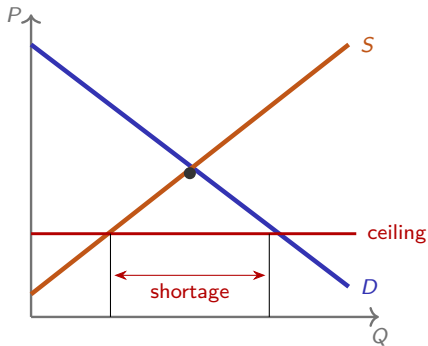
Price too low $\Rightarrow$ shortage 短缺 $\rightarrow$ price rises

Shift rules: D right $\rightarrow P \uparrow Q \uparrow$; D left $\rightarrow P \downarrow Q \downarrow$; S right $\rightarrow P \downarrow Q \uparrow$; S left $\rightarrow P \uparrow Q \downarrow$. When **both shift** 同时移动, one result is **indeterminate** 不确定.

Disequilibrium & shifts



Price controls

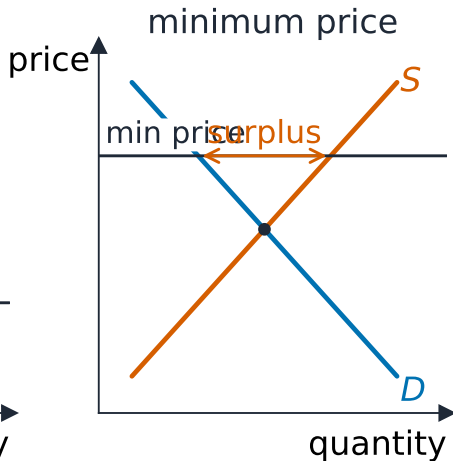
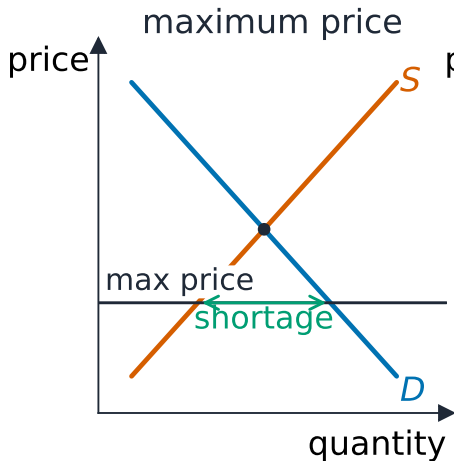


Price ceiling 价格上限 (max): binds **below** equilibrium $\Rightarrow$ shortage (rent control).

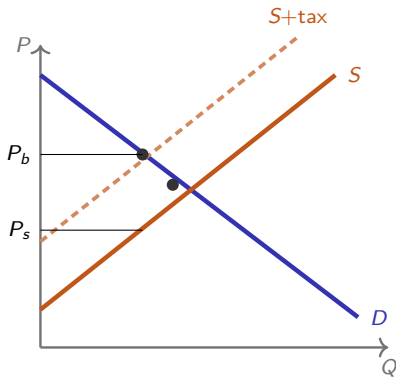
Price floor 价格下限 (min): binds **above** equilibrium $\Rightarrow$ surplus (minimum wage).

Any binding control cuts quantity below efficient:
a **deadweight loss** 无谓损失.

Price controls



Taxes & incidence



A **per-unit tax** 从量税 shifts S up by the tax: buyers pay more (P_b), sellers keep less (P_s), quantity falls, deadweight loss appears.

Tax incidence 税收归宿: the **more inelastic** side pays the larger share – it cannot escape by changing quantity.

International trade

Under **autarky** 自给自足 the price is domestic; opening up, the country trades at the **world price** 世界价格.

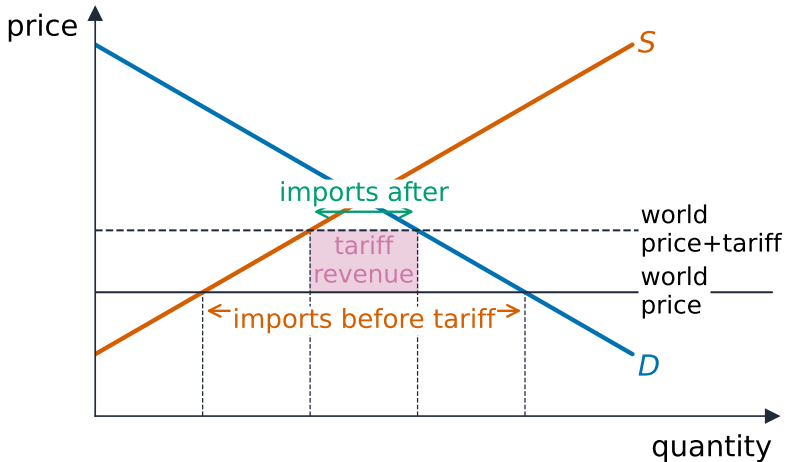
- World price **below** domestic $\Rightarrow$ **importer** 进口国; CS up
- World price **above** domestic $\Rightarrow$ **exporter** 出口国; PS up

Free trade 自由贸易 raises total surplus. A **tariff** 关税 or quota creates deadweight loss.



Open trade links local and world prices

International trade



Key points

Own price → move along;
a **determinant** → shift

PED/PES classify response;
TR test follows elasticity

Equilibrium maximises total surplus ($MB = MC$)

Controls, taxes & tariffs → **deadweight loss**

Check yourself

- 1 Price rises and total revenue falls. Elastic or inelastic?
- 2 A change in price: movement or shift?
- 3 A price ceiling below equilibrium causes what?
- 4 Who bears more of a tax – the more inelastic side or the more elastic?

Answers 1. elastic 2. a movement along the curve 3. a shortage 4. the more inelastic side