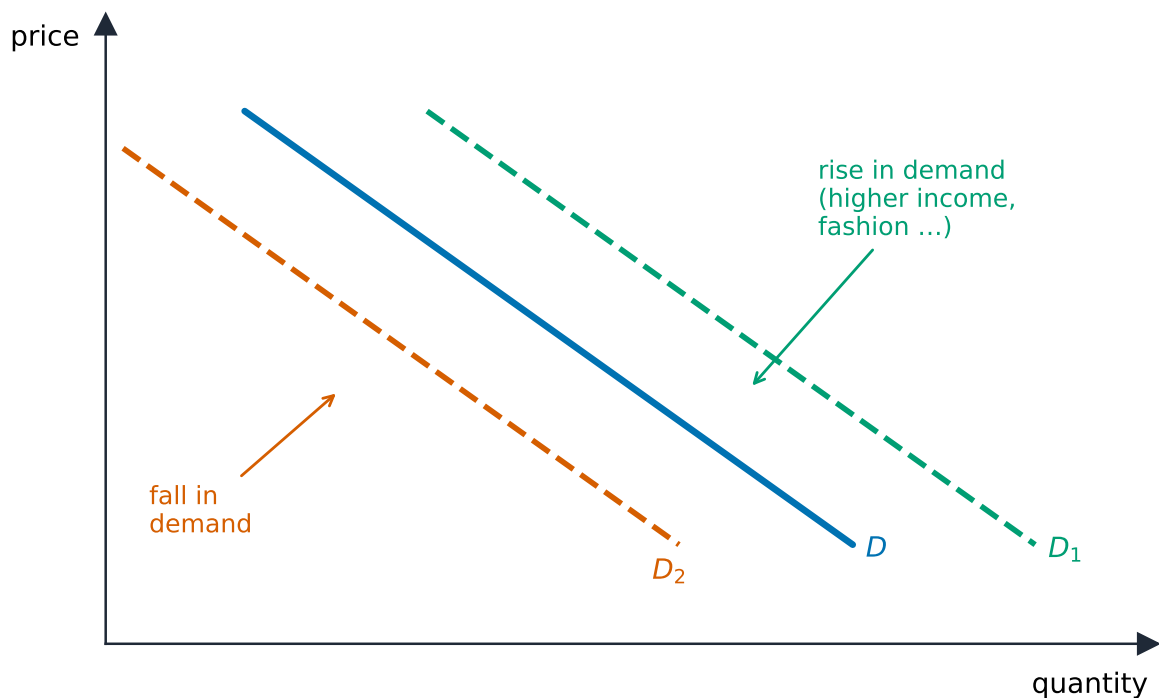


# Supply and Demand

## AP Microeconomics

### Demand

**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).



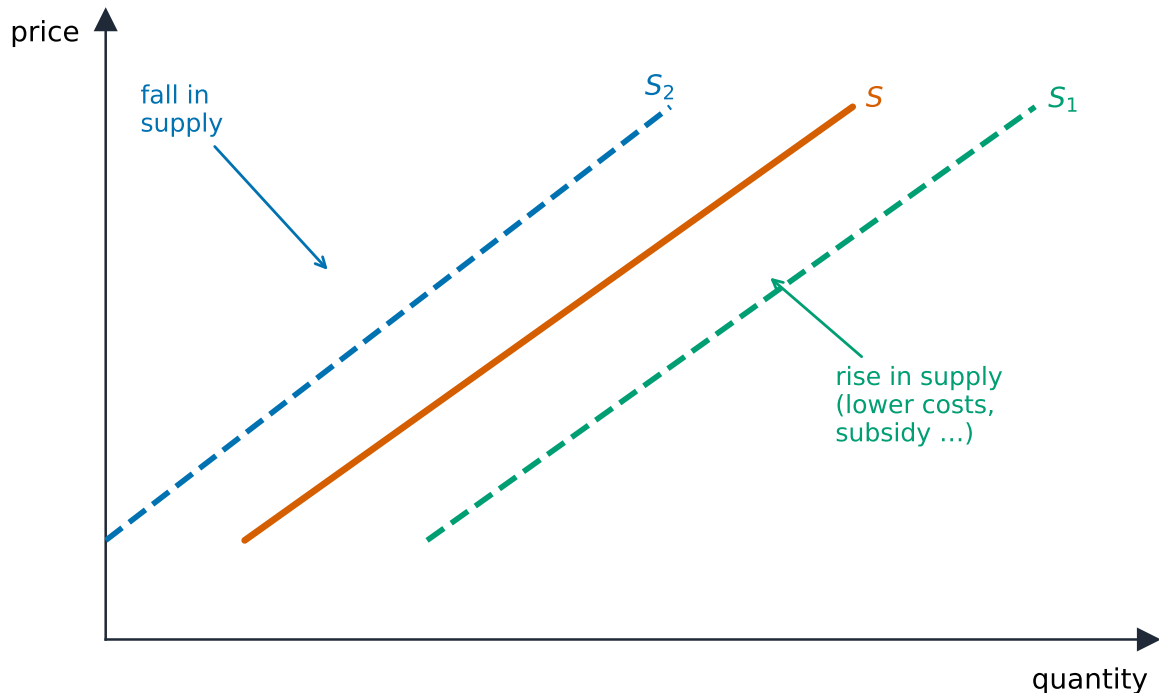
*The demand curve slopes down; income, tastes, and related prices shift it*

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.

# 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*

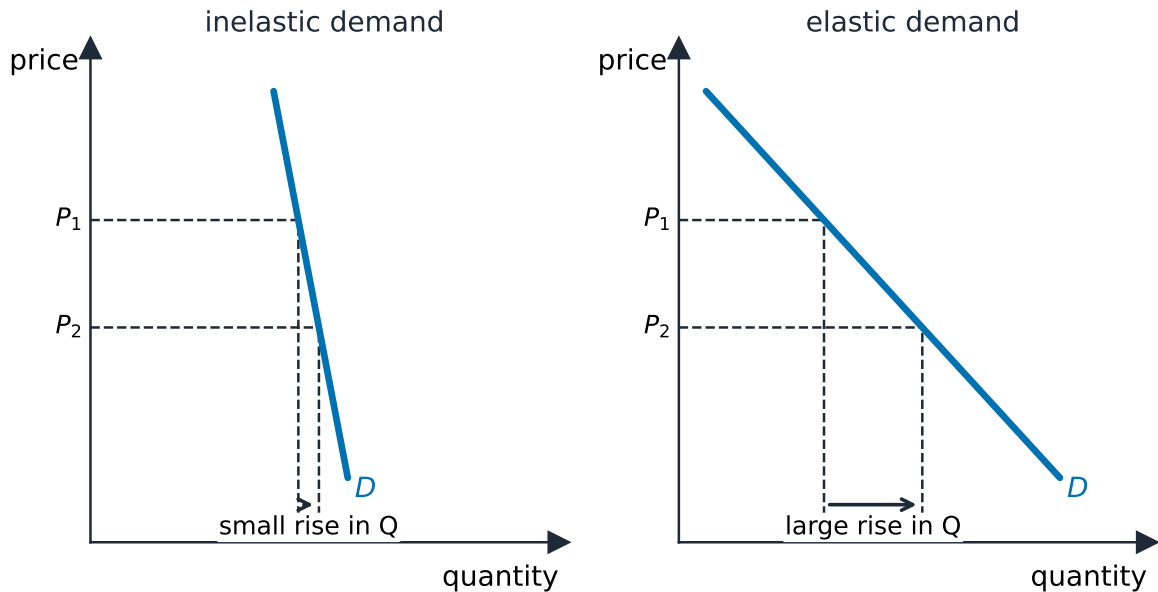
Again separate a **change in quantity supplied** (movement along the curve, from the good's own price) from a **change in supply** (a shift). Supply shifts with **input prices**, **technology**, **taxes and subsidies** 补贴, **prices of other goods** a firm could make, **number of sellers**, and **expectations**.

**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*

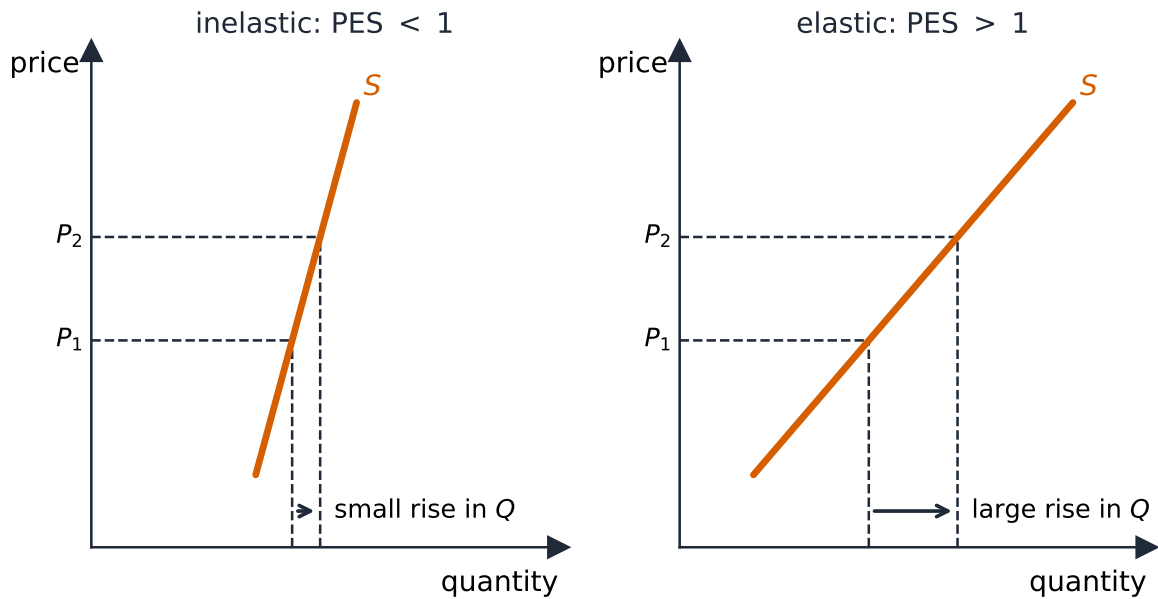
- $E_d > 1$ : **elastic** 富有弹性 (quantity responds strongly);
- $E_d < 1$ : **inelastic** 缺乏弹性 (quantity barely responds);
- $E_d = 1$ : **unit elastic**.

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).

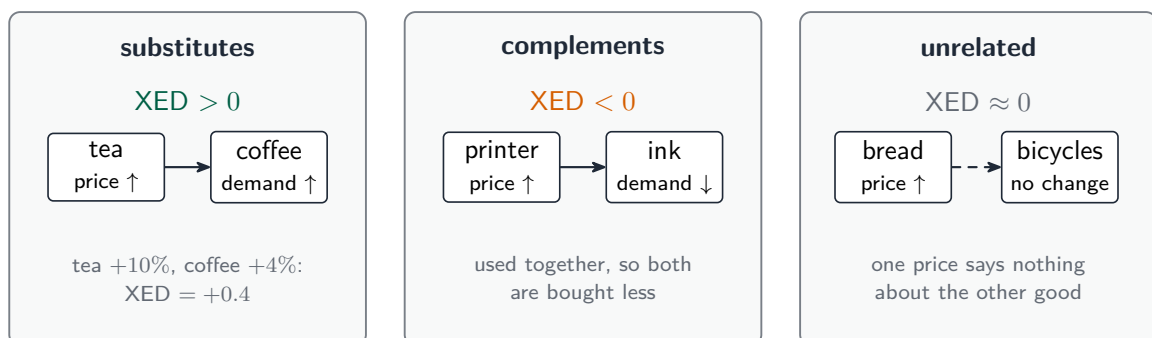


The same price rise gives a small supply response when PES is below 1, a large one above 1

## 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.

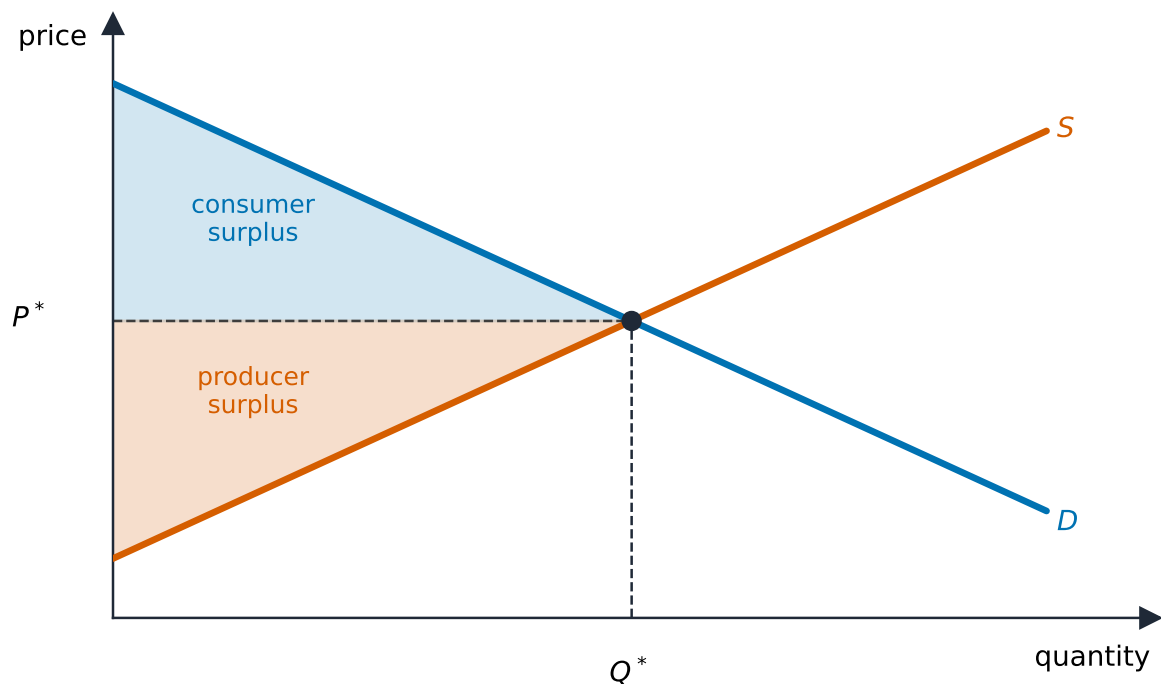


Cross elasticity: positive for substitutes, negative for complements

**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.

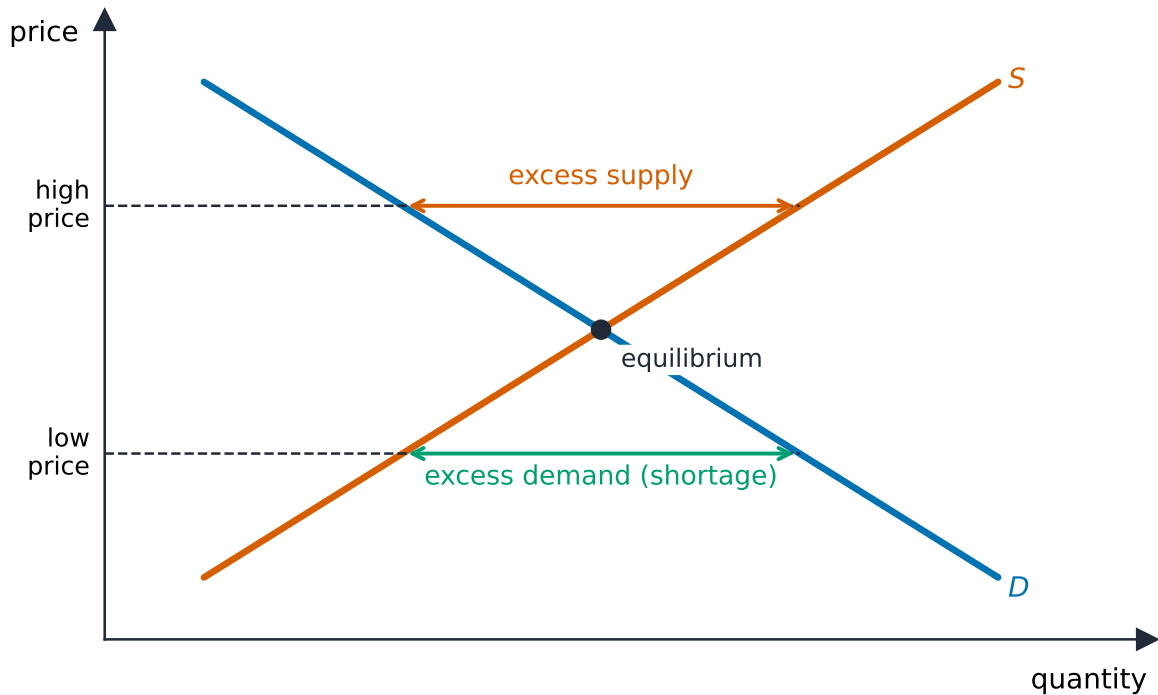


*Consumer surplus and producer surplus at the market equilibrium*

- **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.

## 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.

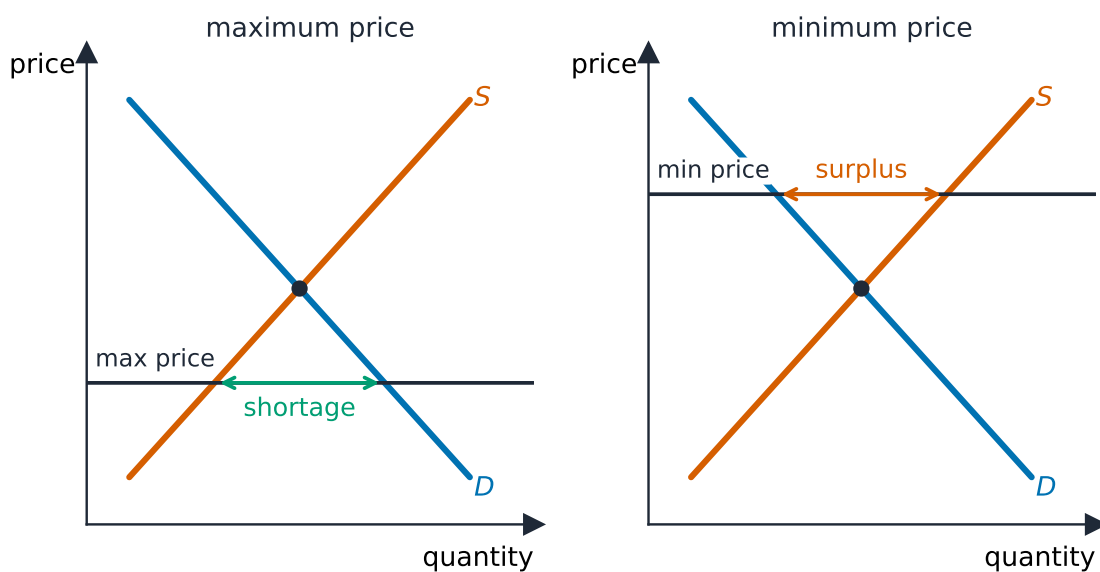


*Above equilibrium there is excess supply; below it, excess demand*

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*

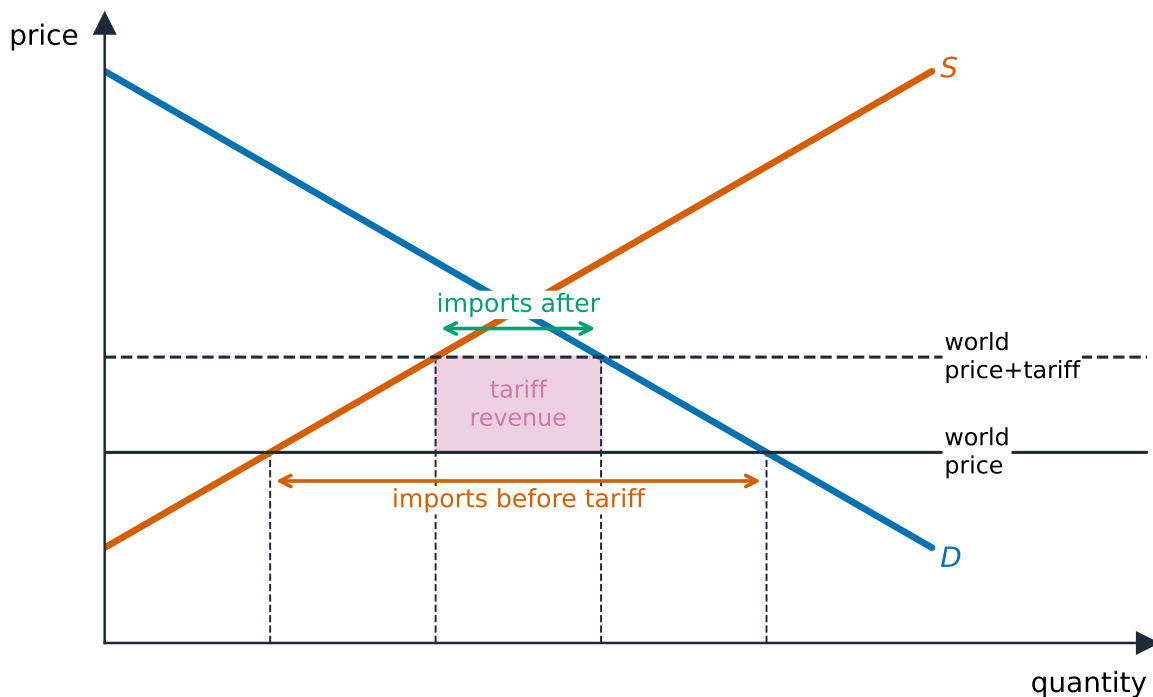
- A **price ceiling** 价格上限 (a legal maximum, like rent control) below equilibrium causes a persistent **shortage**.
- A **price floor** 价格下限 (a legal minimum, like a minimum wage) above equilibrium causes a persistent **surplus**.
- An **excise tax** 消费税 shifts supply up by the tax; the burden (**tax 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.