Course Companion

International Baccalaureate · IB Diploma · Economics · SL

Every topic handout in one volume

全部专题讲义合集

exercises.lol

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Introduction to economics (1.1-1.2)

International Baccalaureate · IB Diploma · Economics · SL

What is economics? How do economists approach the world?

IB Diploma Programme Economics SL, Unit 1 *Introduction to economics* (first assessment 2022). Unit 1 is common to SL and HL; SL sits Papers 1 and 2 plus the portfolio (no Paper 3). This topic covers syllabus sections 1.1 and 1.2 in full: what economics is (scarcity, choice, the economic agents, positive and normative statements) and how economists approach the world (the scientific method, economic models, the ceteris paribus assumption, and the nine key concepts that frame the whole course). Worked numbers are original and re-derived below.

Must-know for Unit 1:

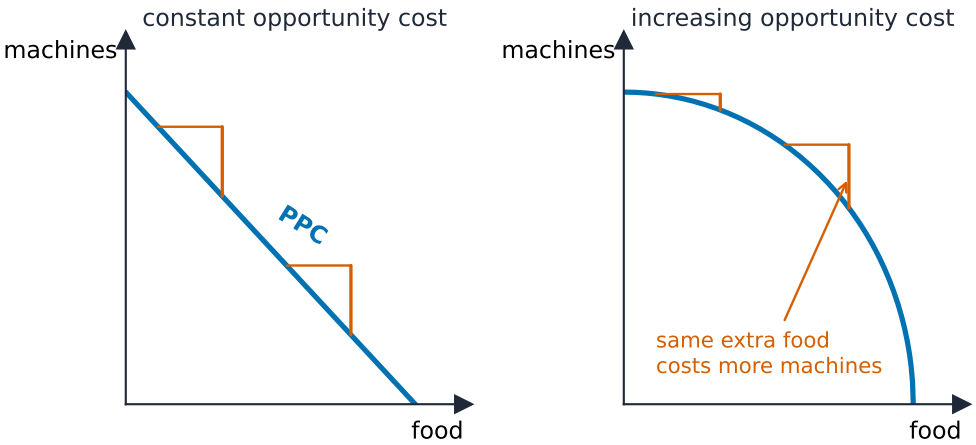
Family	Content
scarcity	unlimited wants, finite resources → choice and opportunity cost
agents	consumers, producers, government (and the "rest of the world" later)
method	hypothesis → model → test against data → revise (models are simplifications)
ceteris paribus	"all other things equal" – isolate one relationship at a time
statements	positive = testable; normative = value judgement
key concepts	scarcity, choice, efficiency, equity, well-being, sustainability, change, interdependence, intervention

What is economics?

Economics 经济学 studies the choices made by economic agents – CONSUMERS, PRODUCERS and the GOVERNMENT (joined later by the rest of the world) – under **scarcity** 稀缺性: unlimited wants against finite resources. Because resources are scarce, every choice has an **opportunity cost** 机会成本 – the next-best alternative forgone – and the basic economic questions are what to produce, how to produce it, and for whom. A student's hour spent revising economics cannot also be spent at work; a government budget spent on hospitals cannot also build schools. Economic **resources** 资源 (the factors of production) are land, labour, capital and enterprise, and each earns a reward – rent, wages, interest and profit.



An outdoor market: economics studies how scarce resources are allocated among competing uses



opportunity cost = goods forgone · bowed-out PPC ⇒ increasing opportunity cost

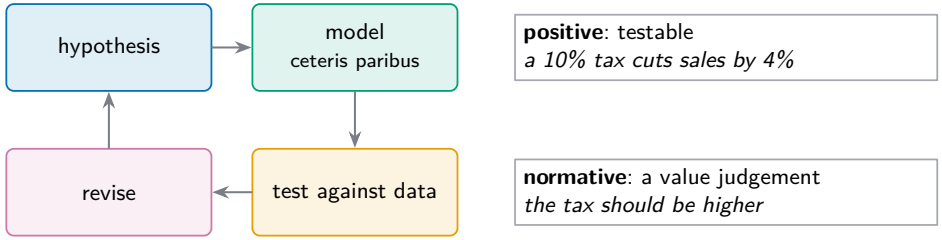
A straight PPC shows constant opportunity cost; a bowed-out PPC shows increasing opportunity cost

The distinction that runs through every Paper 2 data response: a POSITIVE statement is testable against evidence (“the inflation rate fell to 3%”), while a NORMATIVE statement carries a value judgement (”inflation should be lower”). Economists can disagree about values while agreeing about facts, and exam answers must keep the two apart.

> **Worked example.** A government has 10 billion to spend and can build one hospital (benefit valued at 10 bn) or two schools (benefit valued at 7 bn). Choosing the hospital has an opportunity cost of the two schools’ 7 bn of benefit; the choice is rational if the hospital’s benefit exceeds that of the best alternative forgone.

How do economists approach the world?

Economics follows the **scientific method** 科学方法: observe, form a hypothesis, build a **model** 模型 – a simplified representation of reality (demand curves, production possibility frontiers, circular flow) – make predictions, and test them against data, revising the model when it fails. Models deliberately simplify: their value is explanation and prediction, not photographic realism. The **ceteris paribus** 其他条件不变 assumption (”all other things equal”) lets the economist isolate one relationship at a time – how quantity demanded responds to price, holding income and tastes fixed – the same discipline used in every later unit.



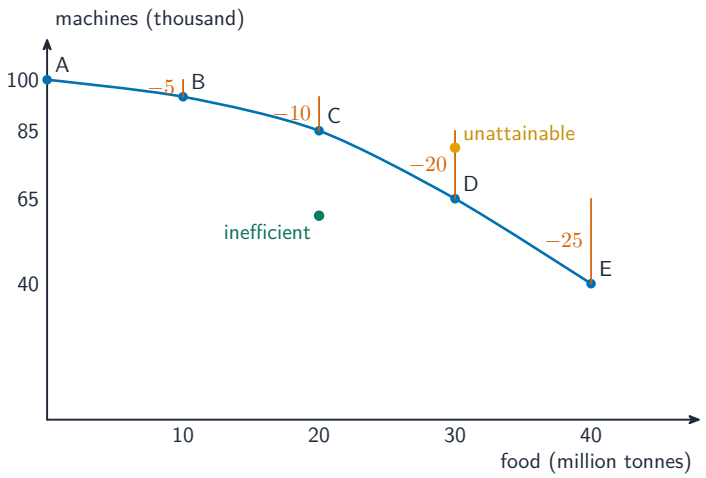
Models are tested simplifications

IB economics frames the whole course through nine **key concepts** 核心概念: SCARCITY and CHOICE (the underlying problem), EFFICIENCY and EQUITY (how well and how fairly resources are used), ECONOMIC WELL-BEING and SUSTAINABILITY (outcomes now and for the future), CHANGE, INTERDEPENDENCE (agents and nations linked through trade and markets) and INTERVENTION (when and how governments act). Every real-world issue the syllabus examines – and every portfolio commentary – is analysed through these lenses.

> **Worked example.** A tuition subsidy is a model question: the hypothesis is that lower fees raise enrolment; the model (demand) predicts enrolment rises when price falls, ceteris paribus; the test compares enrolment before and after, or across regions with and without the subsidy; a mismatch (say, enrolment flat because incomes also fell) sends the economist back to re-specify the model – the method in one loop.

Worked practice: opportunity cost on a PPC

An economy can produce these combinations of food and machines with all its resources, using today's technology:



each extra 10 food costs 5, then 10, 20, 25 machines: the PPC bows outwards

Increasing opportunity cost bows the PPC

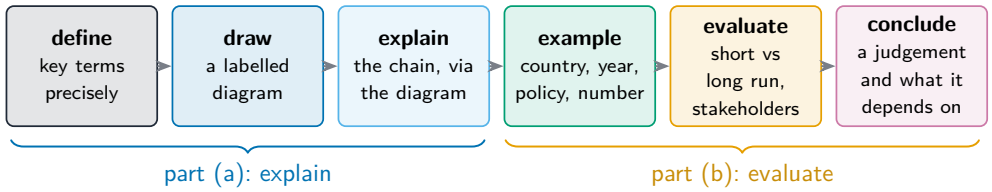
Point	Food (million tonnes)	Machines (thousand)	Opportunity cost of the extra 10 food
A	0	100	–
B	10	95	5 machines
C	20	85	10 machines
D	30	65	20 machines
E	40	40	25 machines

- **Increasing opportunity cost.** Each extra 10 million tonnes of food costs more machines (5, then 10, 20 and 25), so the PPC is bowed outwards. Resources are not equally good at both jobs: the first workers and land moved to farming are the best farmers and the best soil; later ones are better suited to factories.
- **Inside and outside.** Producing 20 food and 60 machines is possible but inefficient: at point C the economy could have 85 machines with the same food. Producing 30 food and 80 machines is unattainable now (D gives only 65 machines).
- **Growth.** Better technology in farming shifts the PPC out along the food axis more than the machine axis: the curve pivots outwards.

A real case. World military spending reached a record of about US$2.7 trillion in 2024 (Stockholm International Peace Research Institute). For each government, the opportunity cost of that spending is the schools, hospitals or lower taxes it could have funded instead. Economists can measure the size of the trade-off (a positive question); whether the spending is worth it is a normative judgement.

Writing a Paper 1 answer

Paper 1 is an extended-response paper. Each question has a part (a), which asks you to **explain** with a diagram, and a part (b), which asks you to **evaluate** using real-world examples. The same skills apply in every unit:



The shape of a Paper 1 answer

1. **Define** the key terms in the question precisely.
2. **Draw** a fully labelled diagram (axes, curves, equilibrium, shifts) and **refer to it** in your writing.
3. **Explain** the chain of cause and effect step by step, using the diagram.
4. **Use a real-world example** with specific detail: the country, the year, the policy and, where you can, a number.
5. **Evaluate:** weigh short-run against long-run effects, consider different stakeholders, question the assumptions (for example *ceteris paribus*), and say which effect matters most and why.
6. **Conclude** with a judgement that answers the question as it is set, and say what it depends on.

The key concepts (scarcity, choice, efficiency, equity, well-being, sustainability, change, interdependence, intervention) are useful frames for evaluation: name the one that fits and use it, rather than listing them all.

Checklist

- Economics defined through scarcity and choice; the three (later four) economic agents (1.1).
- Opportunity cost applied to consumers, producers and government (1.1).
- Resources/factors of production and their rewards (1.1).
- Positive versus normative statements, with the disagreement insight (1.1).
- The scientific method loop: hypothesis → model → prediction → data test → revision (1.2).

- Models as deliberate simplifications; ceteris paribus and what it isolates (1.2).
- The nine key concepts framing every unit; in Paper 1 name the concept, then the theory (1.2).

Demand, supply and policy (2.1-2.7)

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Demand, supply and policy

IB Diploma Programme Economics SL, Unit 2 *Microeconomics* (first assessment 2022). This topic covers the SL content of syllabus sections 2.1–2.7 in full: demand, supply, competitive market equilibrium, the critique of maximizing behaviour, elasticity of demand and supply, and the role of government in microeconomics. One shared market model runs through the worked examples: demand $Q_d = 140 - 2P$ and supply $Q_s = 20 + 4P$, equilibrium $P = 20$, $Q = 100$ – the same numbers used across the Edexcel drives. At SL the model is read as a DIAGRAM: the values quoted below are taken from it, and solving the functions algebraically belongs to HL Paper 3.

Must-know for this topic:

Family	Relationship
demand	$Q_d = 140 - 2P$; movements vs shifts; the Law from diminishing marginal utility
supply	$Q_s = 20 + 4P$; shifts with costs, technology, taxes, subsidies
elasticity	PED $= \frac{\%\Delta Q_d}{\%\Delta P}$; PES $= \frac{\%\Delta Q_s}{\%\Delta P}$; YED; TR test
welfare	consumer + producer surplus; allocative efficiency where $P = MC$
government	indirect taxes, subsidies, price controls; max/min quantity controls

Demand and supply

Demand 需求 is the quantity consumers are willing AND able to buy at each price over a period (2.1). The demand curve slopes downward – the LAW of demand – explained by DIMINISHING MARGINAL UTILITY: each extra unit gives less additional satisfaction, so a lower price is needed to justify it. A change in the good's own price MOVES ALONG the curve; shifts follow income (normal/inferior), the prices of substitutes and complements, tastes, expectations and the number of consumers. CONSUMER choice theory (2.4's critique): the rational, utility-maximising consumer is a simplification – bounded rationality, herd behaviour, framing and imperfect information bend real choices, and BEHAVIOURAL economics supplies the evidence.

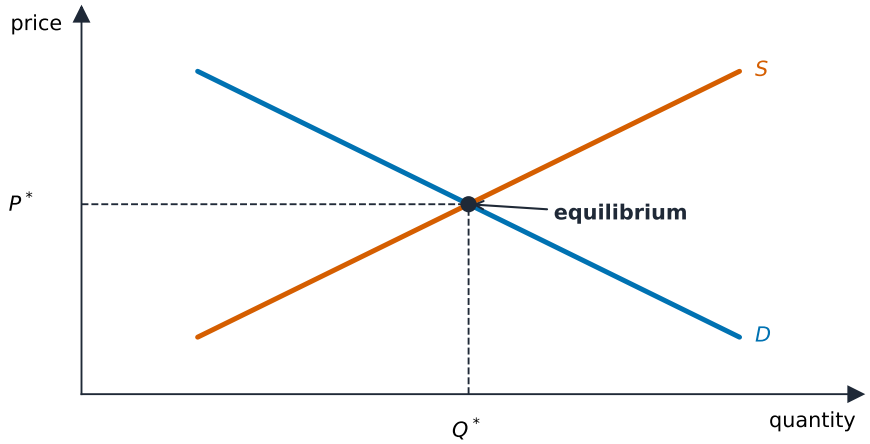


A price change moves along D; a non-price determinant shifts the whole curve

Supply 供给 is the quantity producers are willing AND able to sell at each price (2.2); higher prices make production profitable, so the curve slopes upward. Own-price changes move ALONG; shifts follow costs of production, technology, indirect taxes and subsidies, and the number of sellers. The profit-maximising producer assumption (2.4 again) is also a simplification – satisficing, corporate social responsibility and stakeholder aims bend it.

Competitive market equilibrium

Equilibrium (2.3) is where the curves cross, $Q_d = Q_s$: on the diagram $P^* = 20$, $Q^* = 100$. At $P = 12$ the diagram shows $Q_d = 116$ against $Q_s = 68$: excess demand of 48 – the price is bid up; at $P = 25$, $Q_s = 120$ against $Q_d = 90$: excess supply of 30 – the price is pushed down. The market's self-correction is the "invisible hand" allocating resources by price signals, rationing and incentives.



equilibrium: $Q_d = Q_s$ at (P^*, Q^*) (market clears)

Equilibrium is where quantity demanded equals quantity supplied

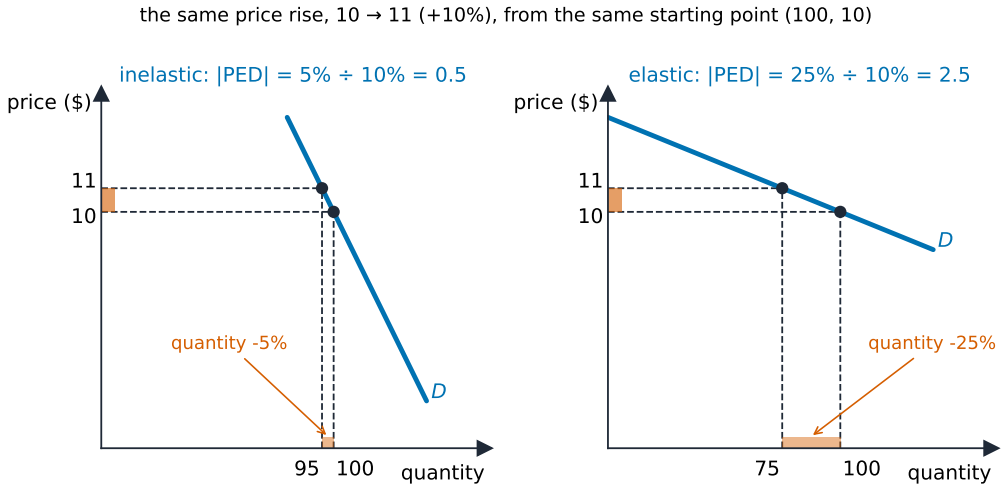
Welfare: **consumer surplus** 消费者剩余 is the area below the demand curve above price; **producer surplus** 生产者剩余 the area above supply below price. At equilibrium here: $CS = \frac{1}{2} \times 100 \times (70 - 20) = 2500$ and $PS = 20 \times 20 + \frac{1}{2} \times (100 - 20) \times 20 = 400 + 800 = 1200$ (supply starts at 20 units when the price is 0, so the area is a rectangle plus a triangle). **Allocative efficiency** 配置效率 holds where $P = MC$ – the competitive equilibrium in the absence of externalities – and the SUM of the surpluses (social surplus) is then maximised. Any price away from equilibrium creates deadweight loss.

Elasticity

Price elasticity of demand 需求价格弹性 (2.5): $PED = \frac{\%\Delta Q_d}{\%\Delta P}$. On the shared model at $P = 20$: price rising to 22 moves Q_d from 100 to 96, so $PED = \frac{-4\%}{+10\%} = -0.4$ – inelastic. The TOTAL REVENUE test: TR $= P \times Q$ rises from 2000 to 2112 when price rises, confirming inelastic demand; TR peaks (unitary PED) at $P = 35$, $Q = 70$, TR $= 2450$. PED depends on substitutes, necessity, the share of income and time. Along a straight-line demand curve PED is NOT constant: it is elastic on the high-price stretch and inelastic on the low-price stretch, so the TR test gives different answers at different points. Firms use PED to set prices; governments use it to predict tax revenue.



A petrol station: with few substitutes in the short run, demand for fuel is price inelastic



The same 10% price rise: a small fall in quantity (inelastic) or a large one (elastic)

Price elasticity of supply 供给价格弹性 (2.6): $PES = \frac{\%\Delta Q_s}{\%\Delta P}$; price 20 → 24 moves Q_s 100 → 116, so PES = +0.8. PES depends on spare capacity, stocks, factor mobility and time. IB applications: primary commodities tend to have INELASTIC supply (growing periods, perishability) and often inelastic demand (necessities) – so small demand shifts cause LARGE price swings, the volatility that commodity exporters suffer.

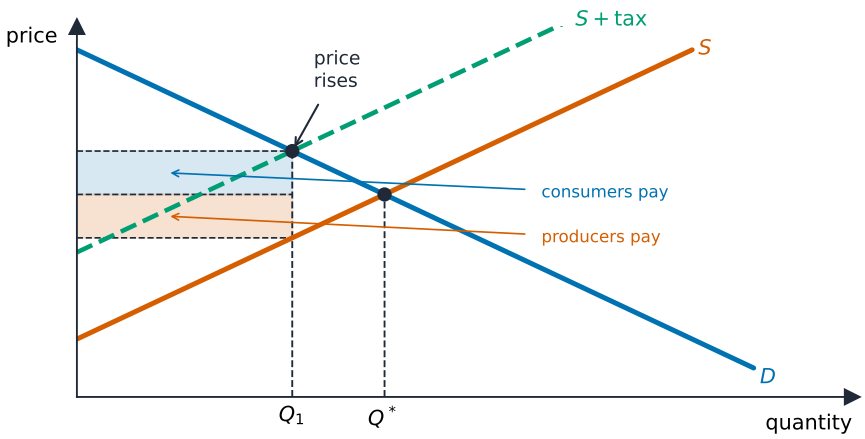
Income elasticity of demand (2.5): YED = $\frac{\%\Delta Q_d}{\%\Delta \text{income}}$ – positive for normal goods, negative for inferior goods, above 1 for luxuries. Firms use YED to forecast demand over the business cycle; for the economy it explains why the primary sector (low YED) shrinks relative to services (high YED) as incomes grow.

The role of government in microeconomics

Government intervenes (2.7) when markets fail or on equity grounds. **Indirect taxes** 间接税: a specific tax of 6 shifts supply vertically up by 6; on the shared diagram the consumer price rises to 24, quantity falls to 92 and producers keep 18 – consumers pay 4 more, producers receive 2 less, revenue $6 \times 92 = 552$ per day, and incidence follows relative elasticity (demand at -0.4 is the inelastic side, so consumers bear more). **Subsidies** 补贴 (6 per unit) reverse the shift: $P_c = 16$, $Q = 108$, cost $6 \times 108 = 648$. Price controls: a **maximum price** 最高价格 at 16 creates excess demand $108-84 = 24$ (rationing, queues, black markets); a **minimum price** 最低价格 at 24 creates excess supply $116-92 = 24$ (the government may have to buy the surplus). Quantity controls (quotas) restrict supply directly. Every intervention answer weighs the correction against unintended consequences – the Unit-1 key concepts (intervention, efficiency, equity) are the framing.

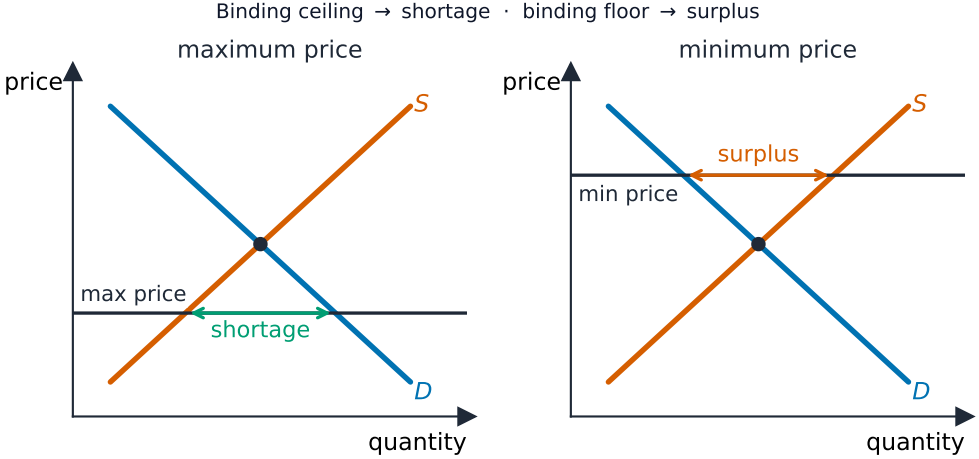


Cigarettes carry heavy indirect taxes: governments use taxes to change both price and consumption



tax: S shifts left · incidence split consumers/producers

An indirect tax shifts supply up; consumers and producers share the burden



A binding maximum price causes a shortage; a binding minimum price causes a surplus

> **Worked example (original, on the shared model).** The market sits at equilibrium (P = 20, Q = 100) and price rises to 25: quantity demanded falls to 140 − 50 = 90. Percentage changes: −10 ÷ 100 = −10% against +5 ÷ 20 = +25%, so PED = 0.4 – inelastic. Total revenue moves 20 × 100 = 2 000 to 25 × 90 = 2 250: with |PED| below 1, the price rise RAISES revenue – the TR test in one motion.

Data-response practice (Paper 2 style)

Extract. In July 2023 India, which supplied about 40% of world rice exports, put an **export ban** 出口禁令 on non-basmati white rice to keep food prices at home low. The FAO All Rice Price Index rose by almost 10% in one month and in August 2023 reached its highest level since 2008. Rice prices jumped in many importing countries in Asia and Africa. India eased the ban in September 2024.

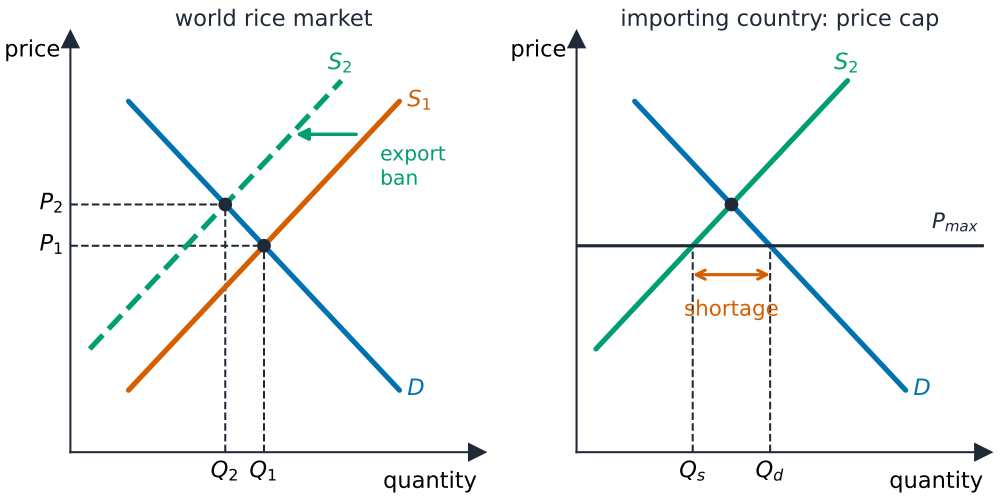
Country R imports most of its rice.

	Before the ban	After the ban
Price of rice ($ per kg)	0.80	1.00
Rice bought (thousand tonnes per month)	50	48

Country R's government is considering a maximum price of $0.85 per kg. At that price sellers would supply 44 thousand tonnes a month, but consumers would want to buy 49.5 thousand tonnes.

Questions

- (a) Define *maximum price*. [2]
- (b) Using a demand and supply diagram, explain why India's export ban raised the world price of rice. [4]
- (c) Calculate the price elasticity of demand for rice in Country R and comment on your answer. [2]
- (d) Using a diagram, explain the effect of the planned maximum price on the rice market in Country R. [4]
- (e) Using information from the text and your knowledge of economics, evaluate the use of a maximum price to protect consumers in Country R from higher rice prices. [15]



Left: the export ban shifts world supply left. Right: a maximum price below the new equilibrium creates a shortage.

Model answers

(a) A maximum price is a legal upper limit on the price of a good, set by the government below the equilibrium price. Sellers may not charge more than this price.

(b) The ban takes Indian rice off the world market, so world supply shifts left from S_1 to S_2 (left panel). At the old price P_1 there is now excess demand, so buyers bid the price up to P_2 and the quantity traded falls from Q_1 to Q_2. The price rises a lot because demand for rice is price inelastic: it is a staple food with few close substitutes.

(c) $\%\Delta Q_d = \frac{48-50}{50} \times 100 = -4\%$ and $\%\Delta P = \frac{1.00-0.80}{0.80} \times 100 = +25\%$, so $PED = \frac{-4}{25} = -0.16$. Demand is very price inelastic: rice is a necessity, so households keep buying it and spend more of their income on it.

(d) In the right panel the maximum price P_{max} is below the new equilibrium price P_2. At P_{max} quantity supplied falls to Q_s (44 thousand tonnes) and quantity demanded rises to Q_d (49.5 thousand tonnes), so there is a shortage of 5.5 thousand tonnes a month. The price cannot rise to clear the market, so rice is shared out in other ways: queues, "first come, first served" or rationing. Some rice may be sold illegally above P_{max} on a black market.

(e) A strong answer explains the theory, uses the diagram and the data, then weighs the arguments.

- **The case for.** Demand is very inelastic ($PED = -0.16$), so the price rise from \$0.80 to \$1.00 mostly raises spending, not saving. Poor households spend a large share of their income on rice and are hit hardest. A cap at \$0.85 lowers the price for everyone who can still buy rice, and it costs the government almost nothing to announce.
- **Shortage and black markets.** The shortage of 5.5 thousand tonnes is about 11% of what consumers want. Rice goes to those who queue first or know the sellers, not to those in most need, and black-market prices may rise above \$1.00.
- **Supply falls further.** Country R imports most of its rice and importers pay the world price. If they must sell below what they pay, they import less, and the shortage grows. Local farmers also receive less, so in the long run, when supply is more elastic, they grow less rice.
- **Stakeholders.** Consumers who get rice gain; those who cannot get it lose. Importers and farmers lose income. The government must pay to enforce the cap and to fight the black market.
- **Alternatives.** The government could pay importers the gap between the world price and \$0.85 (about 0.15×48 million kg = \$7.2 million a month), release rice from a **buffer stock** 缓冲库存, cut any import tariff, or give targeted **cash transfers** 现金转移 or food vouchers to poor households. Transfers protect the poor while the price still signals that rice is scarce.
- **Short run and long run.** The ban was temporary (India eased it in 2024). A short, time-limited cap combined with government imports could protect consumers through a temporary shock. A long-lasting cap would damage supply.

Judgement: a maximum price on its own is unlikely to protect the poorest consumers, because the shortage it creates falls hardest on them. Targeted transfers, with a buffer stock released during the shock, protect them at a known budget cost. If the government does cap the price, the cap should be temporary and the government should fund imports so that supply does not fall.

What examiners reward: precise definitions, a diagram that you refer to in the text, the extract's own numbers (the price rise, the PED, the shortage), more than one stakeholder, and a conclusion that answers the question.

Checklist

- Demand definition, the law from diminishing marginal utility, movements vs shifts (2.1).
- Supply definition, movements vs shifts (2.2).
- Equilibrium (20, 100) read from the diagram; excess demand 48 at 12; excess supply 30 at 25; the invisible hand (2.3).
- The critique of maximizing behaviour: bounded rationality, herding, framing for consumers; satisficing and CSR for producers (2.4).
- PED with the -0.4 calculation and the TR test (2000 → 2112 → 2450); determinants; elastic and inelastic stretches of a straight-line demand curve (2.5).
- PES +0.8 with determinants; commodity volatility from double inelasticity (2.6); YED classifications and the sector shift (2.5).

- Consumer/producer surplus (2500/1200); allocative efficiency at P = MC; social surplus (2.3).
- Government (2.7): tax of 6 (price 24, quantity 92, revenue 552, incidence 4:2); subsidy of 6 (price 16, quantity 108, cost 648); maximum price 16 (shortage 24); minimum price 24 (surplus 24).

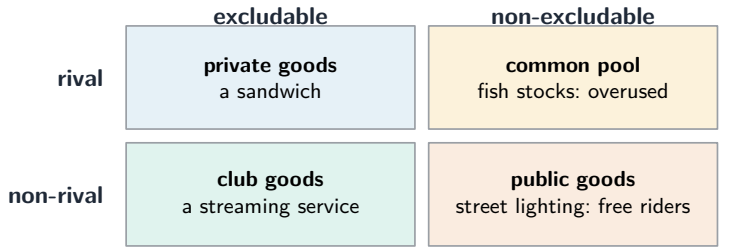
Boundary notes: SL sits Paper 1 (essays) and Paper 2 (data response), not Paper 3 – so elasticity from percentage changes is examinable, while solving linear functions and computing incidence areas is HL. Paper 1 essays want a diagram, definitions and evaluation of government failure against market failure; Paper 2 wants the case data read into the diagram. The nine key concepts (intervention, efficiency, equity) frame the policy questions. All worked numbers are original on the shared model.

Market failure and equity (2.8-2.9, 2.12)

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Market failure and equity

IB Diploma Programme Economics SL, Unit 2 *Microeconomics* (first assessment 2022). This topic covers syllabus sections 2.8 (market failure – externalities and common pool or common access resources) and 2.9 (public goods) in full, and the market's inability to achieve equity (listed as 2.12; at SL the same ground is assessed through 3.4, the economics of inequality and poverty). The externality model reuses the shared curves in inverse form – demand (marginal private benefit) $P = 70 - Q/2$, supply (marginal private cost) $P = Q/4 - 5$, market equilibrium $(100, 20)$ – with an external cost or benefit of 6 per unit. At SL the model is read as a labelled DIAGRAM; the areas quoted are illustrative, and computing them is HL Paper 3.



non-rival + non-excludable → free-rider problem → the market under-provides or provides none

Classify goods by rivalry and excludability

Must-know for this topic:

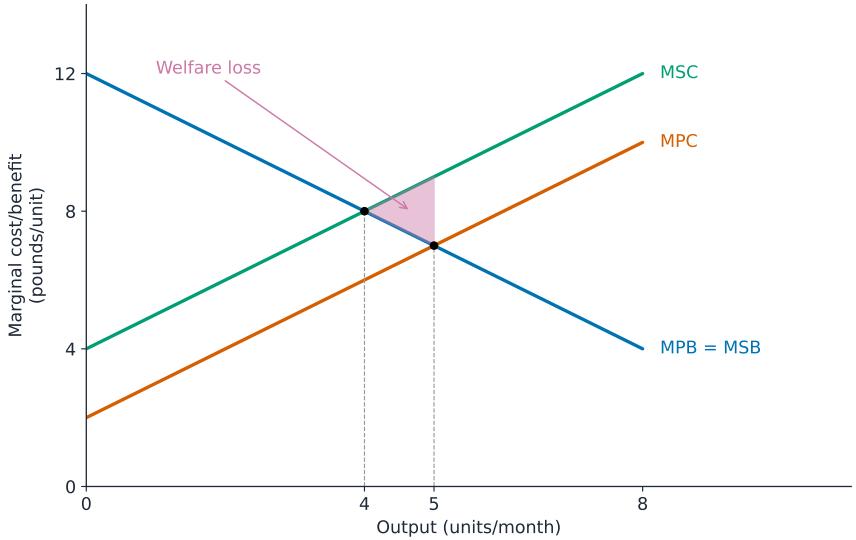
Family	Relationship
welfare	MSC = MPC + EC; MSB = MPB + EB; social optimum where MSB = MSC
externality	external cost 6 → optimum $(92, 24)$, market over-produces 8, welfare loss $\frac{1}{2} \times 8 \times 6 = 24$
public goods	non-rival + non-excludable → free-rider → non-provision
equity	market outcomes carry no guarantee of fairness; Lorenz/Gini measure it

Externalities and common pool resources

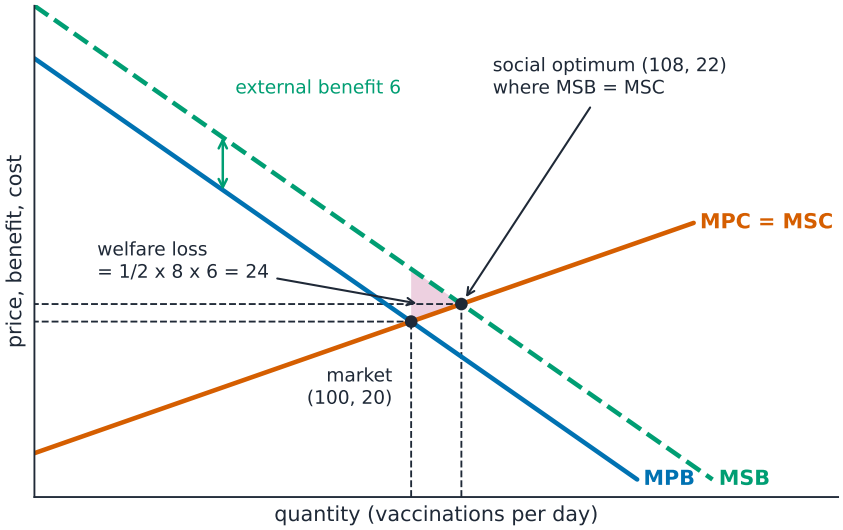
An **externality** 外部性 is a cost or benefit falling on a THIRD PARTY not involved in the transaction (2.8). Negative production externalities – pollution, congestion – put the **marginal social cost** 边际社会成本 MSC above MPC; positive consumption externalities – vaccination, education – put the **marginal social benefit** 边际社会效益 MSB above MPB. The market trades at $(100, 20)$ where MPB = MPC; with an external cost of 6 per unit, MSC = MPC +6 crosses MSB at $(92, 24)$ – the market OVER-produces by 8 units and the deadweight welfare loss is $\frac{1}{2} \times 8 \times 6 = 24$ per day. With an external benefit of 6 on consumption, the social optimum moves to $(108, 22)$, where MSB $= 76 - Q/2$ meets MSC = MPC – the market UNDER-consumes by 8, again sacrificing 24 of welfare. Diagrams label MPB/MSB and MPC/MSC and shade the welfare-loss triangle between the curves over the gap – the drawing earns the marks.



A trawler's net: fish stocks are a common pool resource, rivalrous but hard to exclude anyone from, so they tend to be overfished



Negative production externality: the market produces where MPC = MSB, more than the social optimum



Positive consumption externality on the shared model: the market stops at 100, but the social optimum is 108, where MSB = MSC

Policy responses follow the diagnosis: a Pigouvian TAX equal to the marginal external cost (6 here) shifts MPC to the social optimum; a SUBSIDY equal to the marginal external benefit does the reverse; regulation caps the quantity; tradable permits fix the total and let the market find the price. **Common pool or common access resources** 公共资源 (also 2.8) – fisheries, groundwater, the atmosphere – are RIVAL

but NON-EXCLUDABLE: each user imposes costs on the others, so without property rights or quotas the resource is over-used (the tragedy of the commons), and sustainability – a Unit-1 key concept – frames the long-run evaluation.

Public goods

A **public good** 公共物品 (2.9) is NON-RIVAL (one person's consumption does not reduce another's) and NON-EXCLUDABLE (no one can be stopped from using it): street lighting, national defence, flood control. Non-excludability creates the **free-rider problem** 搭便车问题 – everyone can benefit without paying, so no private firm can collect revenue, so the market UNDER-provides or does not provide at all. The state provides public goods from taxation, valuing them at society's willingness to pay. The contrast pair: common pool resources are non-excludable but RIVAL (each fish caught is gone); public goods are non-excludable AND non-rival – the two exam cases travel together.



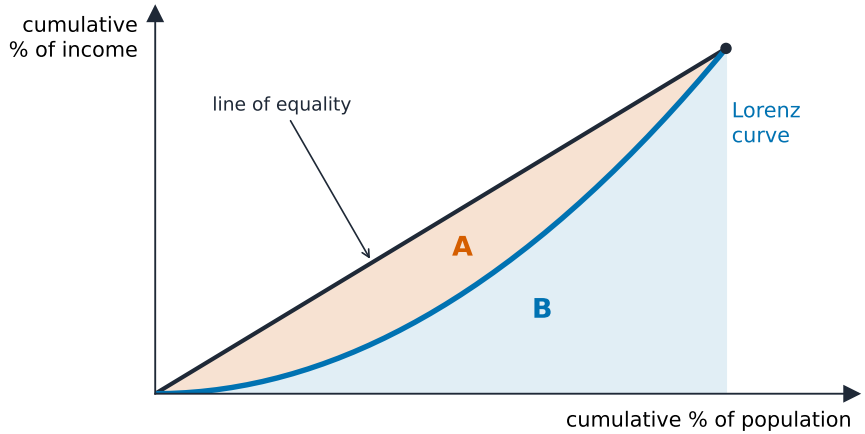
A lighthouse is the classic public good: one ship's use does not reduce another's, and no passing ship can be made to pay

The market's inability to achieve equity

Markets reward scarcity of resources, not need (2.12): the price mechanism answers "for whom?" by willingness and ability to pay, so market outcomes can be efficient yet grossly UNEQUAL – the **equity** 公平 half of the efficiency-equity key-concept pair. IB measures: the LORENZ CURVE plots cumulative income against cumulative population (from the poorest); the GINI COEFFICIENT – area between the equality line and the Lorenz curve over the whole triangle – runs from 0 (perfect equality) to 1 (one person takes all). Original example: quintile shares $5, 10, 15, 20, 50$ percent give a Lorenz curve through $(20, 5), (40, 15), (60, 30), (80, 50)$; the area under it is 3000 of the 10000 square, so Gini $= 1 - 2 \times 0.30 = 0.40$. **Poverty** 贫困 may be ABSOLUTE (basic needs unmet) or RELATIVE (deprivation against the social norm). Responses: progressive taxation, transfer payments, and access to education and health – each weighing equity gains against incentive and efficiency costs, the trade-off every Paper-1 essay must evaluate. The Gini arithmetic shown is a reading aid; SL is asked to interpret the coefficient and the curve, not to compute areas.



Wealth and poverty side by side: a market rewards what people own and can sell, which need not be equitable



Gini $= A/(A+B)$ · 0 = equal, 1 = most unequal

The further the Lorenz curve bows from the diagonal, the more unequal income is; Gini = A/(A+B)

Worked example (original, on the shared model). Production carries an external cost of 3 per unit, so a corrective tax of 3 shifts supply to Q_s = 20 + 4(P − 3). New equilibrium: 140 − 2P = 8 + 4P, so P = 22 and Q = 96. Consumers pay 2 of the 3 (20 → 22); producers keep 19 of the 22; the state collects 3 × 96 = 288 while the quantity shrinks toward the social optimum – incidence and internalisation in one set of numbers.

Data-response practice (Paper 2 style)

Extract. The European Union's Emissions Trading System (EU ETS) started in 2005. It sets a cap on the total carbon dioxide that power stations, factories and airlines inside the EU may emit, and firms must hold one permit for each tonne. Firms that cut emissions cheaply can sell spare permits; firms that pollute more must buy them. Too many permits were issued at first, so for much of 2012–2017 the price stayed below €10 per tonne and firms had little reason to change. After the EU removed surplus permits, the price passed €100 per tonne for the first time in February 2023. Because firms outside the EU pay no such price, the EU is adding a carbon charge on some imports such as steel and cement, with payments due from 2026. China's national carbon market began trading in July 2021. It covers the power sector and is the world's largest carbon market by emissions covered, but its permit price has been far below the EU's.

Firm K, an EU steel maker, emits 1.0 million tonnes of CO_2 a year but holds permits for only 0.8 million tonnes. It can cut 0.2 million tonnes at a cost of €60 per tonne, and the permit price is €90 per tonne.

Questions

- (a) Define *negative externality.* [2]
- (b) Using an externality diagram, explain why a market for electricity from coal produces more than the social optimum. [4]
- (c) Explain how a **cap and trade** 总量管制与交易 scheme reduces emissions. [4]
- (d) Calculate the cost to Firm K of each way to cover its extra 0.2 million tonnes, and state which it will choose. [2]
- (e) Using information from the text and your knowledge of economics, evaluate the use of tradable permits, compared with a **carbon tax** 碳税, to reduce carbon emissions. [15]

Model answers

(a) A negative externality is a cost that falls on a third party, outside the transaction, and is not paid by the buyer or the seller. It makes marginal social cost greater than marginal private cost.

(b) Burning coal releases CO_2, which harms third parties through climate change. This external cost puts MSC above MPC (see the diagram above). The market produces where MPB = MPC, but the social optimum is where MSB = MSC, at a lower output and a higher price. Every unit between the two quantities costs society more than it is worth, so there is a welfare loss: the triangle between MSC and MSB over the extra output.

(c) The government sets a cap: the total number of permits, so total emissions cannot exceed it. Permits can be traded, which gives them a price. A firm that emits one more tonne must buy a permit or give one up, so pollution now has a private cost and MPC moves towards MSC. Firms that can cut emissions cheaply sell permits to firms for which cutting is expensive, so the total cut is reached at the lowest cost. Lowering the cap each year raises the permit price and cuts emissions further.

(d) Cutting costs $0.2 \times 60 = 12$, that is €12 million; buying permits costs $0.2 \times 90 = 18$, that is €18 million. Firm K cuts its own emissions and saves €6 million. A permit price above the firm's cost of cutting is what makes it cut.

(e) A strong answer explains both tools, uses the data, then weighs them.

- **Certainty of quantity.** A permit scheme fixes the total emissions (the cap), and the market finds the price. A carbon tax fixes the price, and the quantity is uncertain, because the government does not know how strongly firms will respond. For a climate target in tonnes, the cap is the more direct tool.
- **Cost-effectiveness.** Both tools give every firm the same price per tonne, so the cheapest cuts happen first: Firm K cuts, because €60 is below €90. Permits do this without the government needing to know each firm's costs.
- **Price instability.** The EU price stayed below €10 for years because too many permits were issued. That gave firms little reason to invest, and the price must be stable for firms to plan long-lived investments such as new furnaces. A carbon tax gives a known, steady price. Sweden has used one since 1991, and it is now among the highest in the world. The EU had to remove permits to make its price work, which shows the risk of government failure in setting the cap.
- **Revenue and fairness.** Auctioned permits and a tax both raise revenue that could cut other taxes or help poor households with higher energy bills. Permits given away free reward existing polluters.
- **Carbon leakage** 碳泄漏. If only one region prices carbon, production can move to places without a price, with no fall in world emissions. The EU's import charge tries to stop this, but it raises costs for trading partners and may cause trade disputes.
- **Monitoring.** Both tools need emissions to be measured accurately. Permits also need a working market. China's low permit price shows that the design (how tight the cap is, and the penalties) matters as much as the choice of tool.

Judgement: tradable permits are the better tool when the aim is a fixed emissions target and the cap is set tight and lowered over time; a carbon tax is better when price stability matters most and the government cannot judge the right cap. In practice the EU combined them: a tighter cap with a reserve that removes surplus permits gives a price floor, which is close to a tax. Either way, the result depends on a strict cap or a

high enough rate, and on how other countries respond.

What examiners reward: a fully labelled externality diagram (MPB, MSB, MPC, MSC, both quantities, the welfare-loss triangle), the extract's own numbers (the €10 and €100 prices, Firm K's €60 and €90), at least two stakeholders, and a conclusion that compares the two tools.

Checklist

- Externality definition; MSC/MSB with the $(100, 20) \rightarrow (92, 24)$ negative-production and $(108, 22)$ positive-consumption optima; welfare loss 24 in each direction (2.8).
- Pigouvian tax and subsidy at the marginal external cost/benefit; regulation; tradable permits (2.8 policy, labelled diagrams).
- Common pool or common access resources: rival + non-excludable, tragedy of the commons, sustainability (2.8).
- Public goods: non-rival + non-excludable; the free-rider problem and non-provision; state provision (2.9).
- The market's "for whom" answer and its equity failure; Lorenz curve and Gini read at 0.40; absolute vs relative poverty; the three redistribution instruments and their trade-offs (2.12; SL assesses this through 3.4).

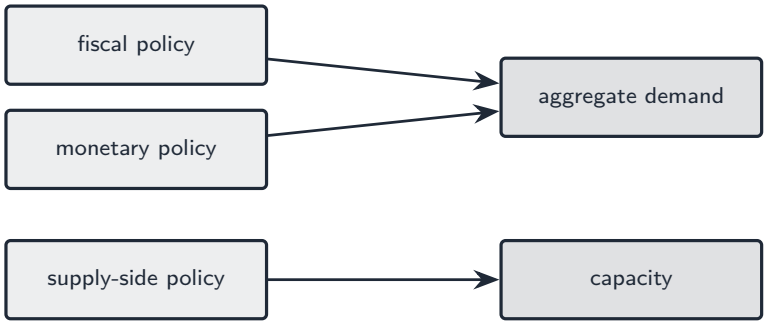
Boundary notes: SL Paper 1 essays on market failure want the labelled diagram (MPB/MSB/MPC/MSC, both optima, the shaded triangle), a policy with its mechanism, and evaluation of government failure against the market failure it corrects. The key concepts sustainability, equity, efficiency and intervention frame this whole topic. All worked numbers are original on the shared model.

Macroeconomic activity, objectives and policy (3.1-3.7)

International Baccalaureate · IB Diploma · Economics · SL

Macroeconomic activity, objectives and policy

IB Diploma Programme Economics SL, Unit 3 *Macroeconomics* (first assessment 2022). This topic covers the SL content of sections 3.1 to 3.7: measuring the economy, its ups and downs, aggregate demand and supply, the government's goals, inequality and poverty, and the three kinds of policy (monetary, fiscal and supply-side). One model runs through the worked examples: real GDP in $billion, aggregatedemandP = 90 - Y/2, short - runaggregatesupplyP = 20 + Y/2$ and full-employment output 80. All numbers are original. The multiplier, the Phillips curves, government debt and the calculations are HL extensions, so they are left out here.



Fiscal and monetary policy act on demand; supply-side on capacity

In 2020 many countries saw output fall faster than at any time since the 1930s. Shops closed, workers lost hours, and governments spent huge sums to support incomes. Central banks cut interest rates close to zero. Two years later, inflation in many rich countries reached its highest level in about 40 years, and the same central banks raised rates quickly. Macroeconomics explains why output, jobs and prices move together like this, and what policy can do about it.

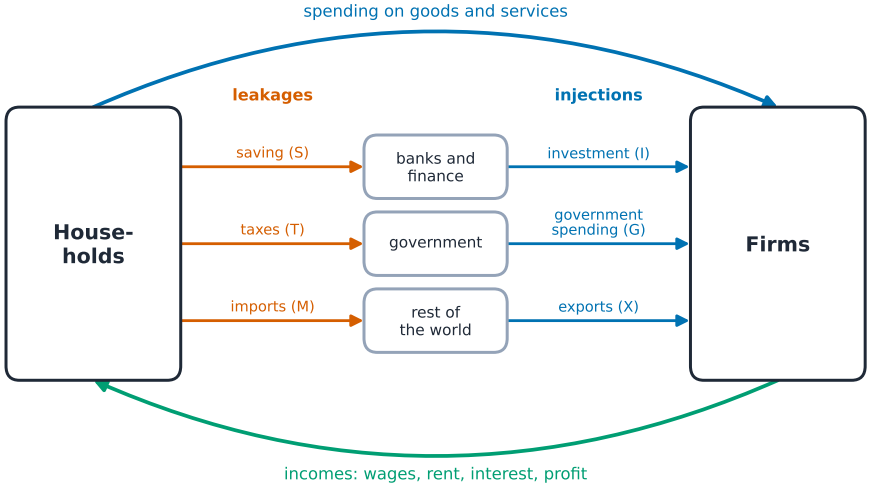
Must-know for this topic:

Idea	Key relationship
GDP	output = income = expenditure; real GDP removes price changes
aggregate demand	AD $= C + I + G + (X - M)$
equilibrium	AD meets SRAS at $Y = 70$, $P = 55$; full employment 80, so a recessionary gap of 10
objectives	low unemployment, low and stable inflation, growth, equity
policy	monetary (interest rates), fiscal (G and T), supply-side (LRAS)

Measuring economic activity

The circular flow of income

Households own the **factors of production** 生产要素 (land, labour, capital and enterprise). They sell them to firms and earn incomes. They spend these incomes on firms' goods and services. Money therefore flows in a circle.



Leakages leave the flow of income; injections come back in

Some money leaves the circle. These are **leakages** 漏出: saving (S), taxes (T) and spending on imports (M). Other money enters it. These are **injections** 注入: investment (I), government spending (G) and export revenue (X). If injections are larger than leakages, national income grows. If leakages are larger, income falls.

Three ways to measure output

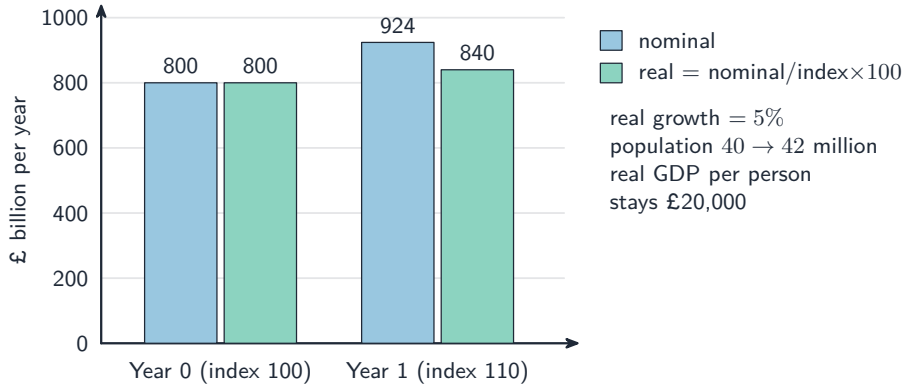
Gross domestic product 国内生产总值 (GDP) is the value of all final goods and services produced in a country in one year. The circular flow shows three ways to measure it, and in principle they give the same answer:

- the **output method**: add the value of what each industry produces;
- the **income method**: add all incomes (wages, rent, interest, profit);
- the **expenditure method**: add all spending, $C + I + G + (X - M)$.

Gross national income 国民总收入 (GNI) is GDP plus income that residents earn abroad, minus income that foreigners earn in the country. It matters for countries with many workers abroad or much foreign-owned industry.

Nominal and real, totals and per person

- **Nominal GDP** 名义国内生产总值 uses each year's own prices.
- **Real GDP** 实际国内生产总值 removes the effect of price changes, so it shows whether the country really produced more.
- **GDP per capita** 人均国内生产总值 divides by the population, which is better for comparing living standards.
- **Purchasing power parity** 购买力平价 (PPP) converts currencies at rates that buy the same basket of goods in each country. A dollar buys more haircuts in Chengdu than in London, so PPP figures compare real living standards more fairly.



Real GDP removes price rises; per-capita figures also divide by population

Limits of GDP and other measures

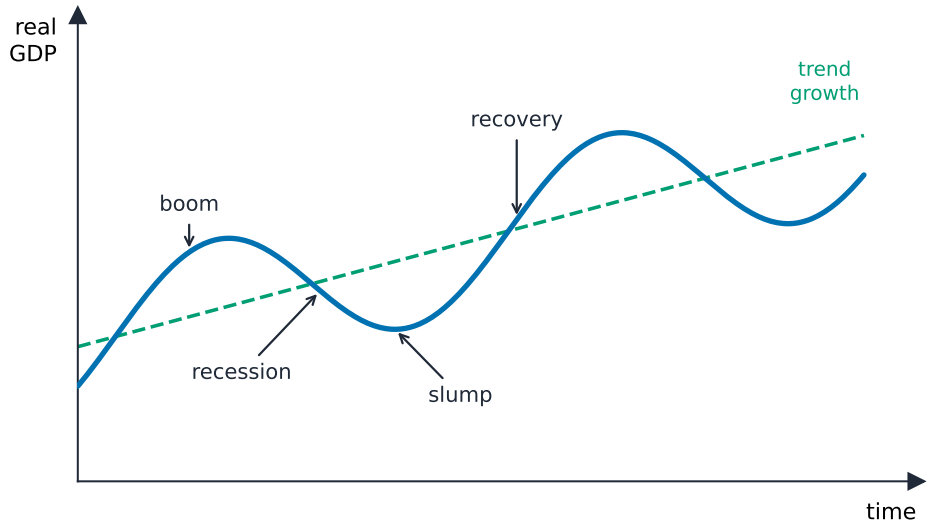
GDP is not the same as well-being. It leaves out unpaid work at home and the **informal economy** 非正规经济. It says nothing about how income is shared. It counts the output of a polluting factory but not the damage the pollution does. It ignores leisure time and the quality of goods.

So economists also use other measures:

- the **Human Development Index** 人类发展指数 (HDI), which combines income per head (GNI per capita at PPP), health (life expectancy) and education (years of schooling);
- the OECD Better Life Index, the Happy Planet Index and the Genuine Progress Indicator, which add measures such as the environment, health, work-life balance and how satisfied people say they are.

The business cycle

Real GDP does not grow smoothly. It moves up and down around its long-term **trend** 趋势 in a pattern called the **business cycle** 经济周期.



Real GDP rises and falls around its long-term trend

- In a **boom** 繁荣, output is above trend, unemployment is low and inflation tends to rise.
- In a **recession** 衰退, real GDP falls. Often this means two quarters in a row of falling output. Unemployment rises.
- At the bottom (the slump), output is furthest below trend.
- In the **recovery** 复苏, output and jobs grow again.

The gap between actual and potential output is the **output gap** 产出缺口.

Aggregate demand and aggregate supply

Aggregate demand

Aggregate demand 总需求 (AD) is total planned spending on a country's goods and services at each price level:

$$AD = C + I + G + (X - M)$$

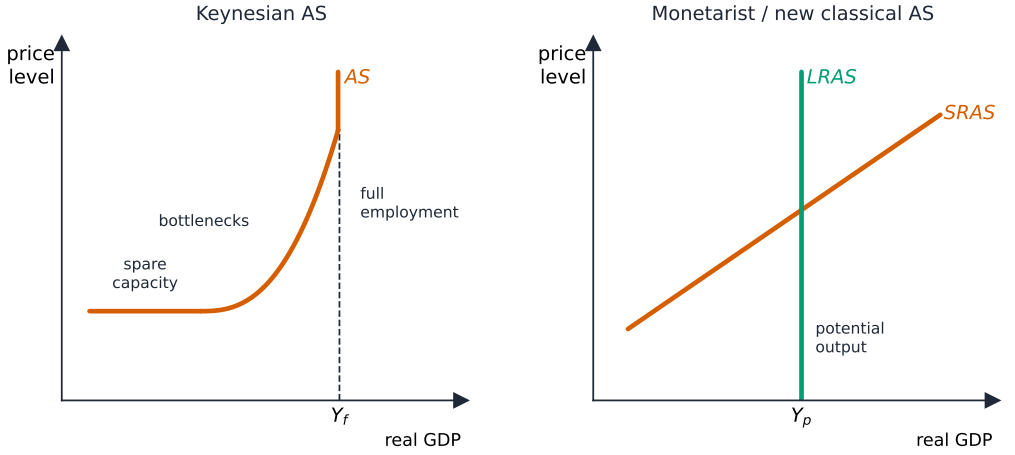
Component	What changes it
consumption (C)	income, interest rates, confidence, wealth, household debt
investment (I)	interest rates, business confidence, technology, profits
government spending (G)	government priorities, the state of the economy
net exports (X − M)	incomes abroad, the exchange rate, trade policy

The AD curve slopes down. A higher price level makes people's money and savings worth less, raises interest rates and makes exports dearer, so real spending falls. A change in the price level is a movement ALONG AD. A change in any component (at the same price level) SHIFTS AD.

Aggregate supply

Short-run aggregate supply 短期总供给 (SRAS) slopes up: when the price level rises and wages stay fixed for a while, production becomes more profitable. SRAS shifts when firms' costs change: wages, oil and raw material prices, business taxes, or a supply shock such as a drought.

Economists disagree about the long run.



Keynesian and monetarist views of aggregate supply

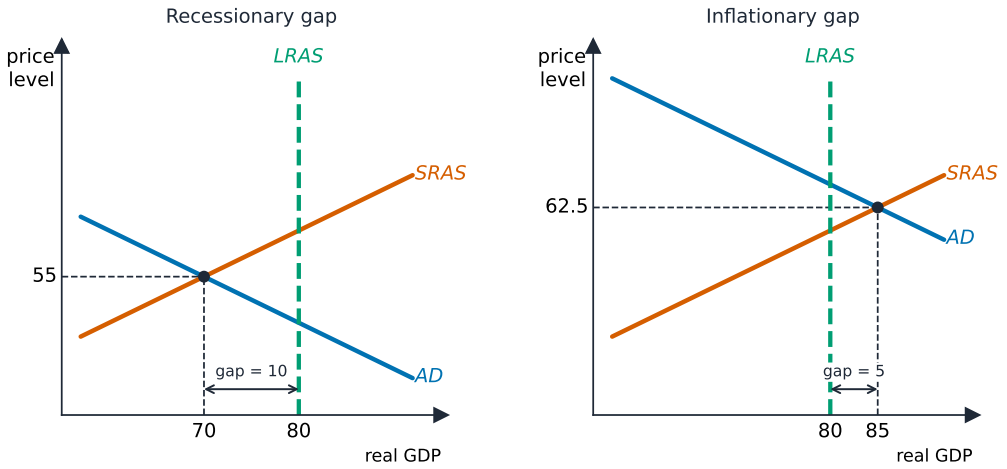
- In the **monetarist** 货币主义 (new classical) view, the **long-run aggregate supply** 长期总供给 (LRAS) curve is vertical at **potential output** 潜在产出. In the long run wages adjust, so the economy returns to full employment by itself. Demand changes only move the price level.
- In the **Keynesian** 凯恩斯主义 view, the economy can stay stuck below full employment. When there is a lot of spare capacity, AS is flat: more demand raises output without raising prices. Near full capacity, bottlenecks push prices up, and at full employment AS is vertical.

LRAS (and the vertical part of Keynesian AS) shifts right when the quantity or quality of factors of production increases: more workers, better education, new technology, more capital, better institutions.

Equilibrium and output gaps

> **Worked example.** AD is $P = 90 - Y/2$ and SRAS is $P = 20 + Y/2$. Full-employment output is 80.

- Equilibrium: $90 - Y/2 = 20 + Y/2$, so $Y = 70$ and $P = 55$.
- Output is 10 below full employment. This is a **recessionary gap** 衰退性缺口 (also called a deflationary gap), with cyclical unemployment.
- If AD rises to $P = 105 - Y/2$: $105 - Y/2 = 20 + Y/2$, so $Y = 85$ and $P = 62.5$. Output is 5 above full employment. This is an **inflationary gap** 通胀性缺口: the price level is pushed up.



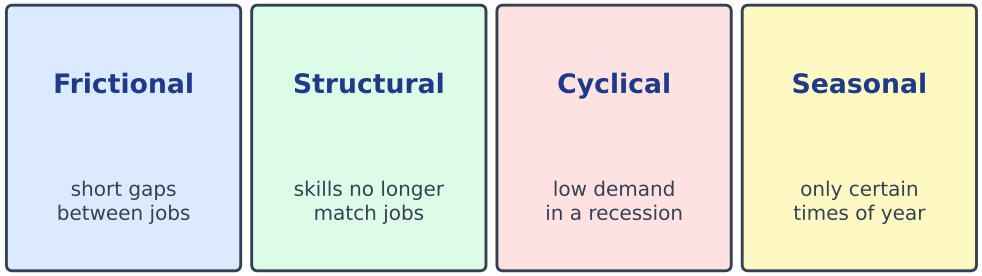
A recessionary gap and an inflationary gap on the same SRAS and LRAS

In the monetarist view, both gaps close by themselves in the long run. With a recessionary gap, unemployed workers accept lower wages, SRAS shifts right and output returns to 80. Keynesians reply that wages rarely fall, so a recession can last for years unless the government acts.

Macroeconomic objectives

Low unemployment

A person is **unemployed** 失业 if they are of working age, have no job, and are actively looking for work (the ILO definition).



Exam: name the type + cause — match policy to cause; results depend on vacancies and spare capacity

The four types of unemployment: frictional (between jobs), structural (skills no longer match), cyclical (low demand in a recession) and seasonal

The unemployment rate is the number unemployed as a percentage of the **labour force** 劳动力: everyone who is employed plus everyone who is unemployed.

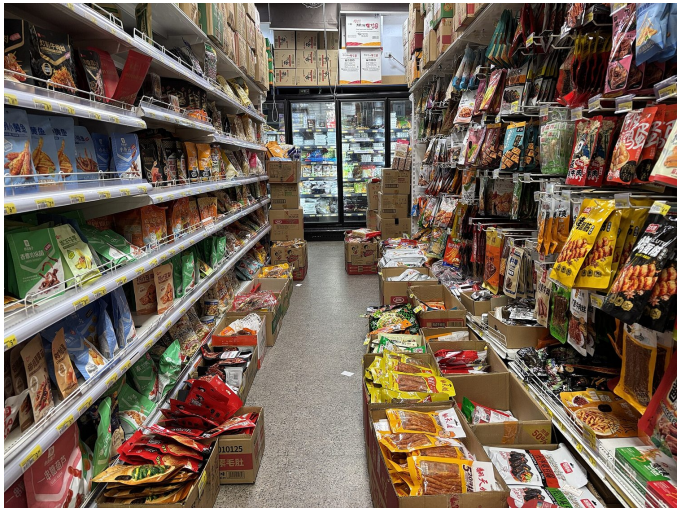
The official rate can hide problems. It leaves out **discouraged workers** 丧志工人 who have stopped looking, and people working part-time who want more hours. It also hides big differences between regions, ages and ethnic groups.

Type	Cause	Example
cyclical (demand-deficient)	AD falls in a recession	factory jobs cut as orders fall
structural	skills or location no longer match the jobs	coal miners after mines close
frictional	time spent moving between jobs	a graduate searching for a first job
seasonal	demand changes with the season	ski instructors in summer

Unemployment costs the jobless (lost income, lost skills, stress and poor health) and the whole economy (lost output, lower tax revenue, higher benefit spending, and possibly crime and social tension).

Low and stable inflation

Inflation 通货膨胀 is a sustained rise in the general price level. **Deflation** 通货紧缩 is a sustained fall. **Disinflation** 通胀放缓 is a fall in the rate of inflation: prices still rise, but more slowly. Inflation is measured with a **consumer price index** 消费者价格指数 (CPI), the weighted average price of a basket of goods that a typical household buys. The CPI has limits. A household's own basket may be different, quality improvements are hard to count, and people switch to goods whose prices rose less.



A CPI follows prices across a household consumption basket, not just one product.

- **Demand-pull inflation** 需求拉动型通胀: AD grows faster than the economy can produce (an inflationary gap).
- **Cost-push inflation** 成本推动型通胀: firms' costs rise (oil, wages, imported materials) and SRAS shifts left. Prices rise while output falls.

High inflation hurts people on fixed incomes and savers, makes planning hard, and makes exports less competitive. Deflation is also harmful: consumers delay spending because goods will be cheaper later, the real value of debts rises, and firms cut output and jobs. This is why most central banks aim for low, steady inflation of about 2%.

Economic growth

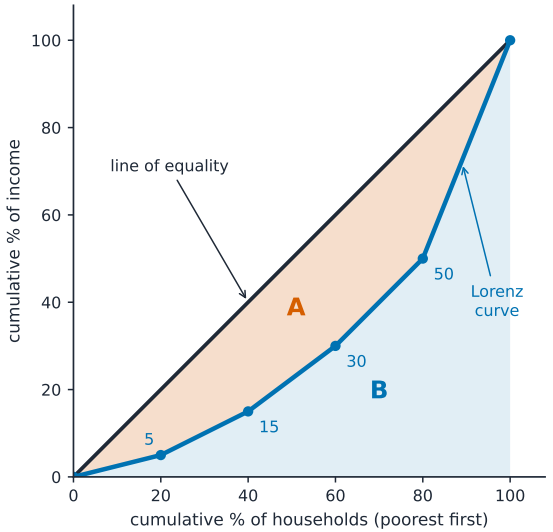
Economic growth 经济增长 is an increase in real GDP. In the short run, growth can come from more AD using spare capacity. In the long run it needs more or better factors of production, shown by LRAS (or the production possibilities curve) shifting right. Growth raises incomes and tax revenue and can reduce poverty, but it can also harm the environment and widen inequality. So the goal is sustainable growth.

The economics of inequality and poverty

Measuring inequality

Income 收入 is a flow (money earned each year). **Wealth** 财富 is a stock (the value of what people own). Wealth is usually far more unequal than income.

The **Lorenz curve** 洛伦兹曲线 plots the share of income received by the poorest 20%, 40%, and so on. The straight line is perfect equality. The further the curve sags below it, the more unequal the country. The **Gini coefficient** 基尼系数 is area A divided by the whole area under the line of equality (A + B). It runs from 0 (perfect equality) to 1 (one person has everything). In the example below, the five fifths of households earn 5%, 10%, 15%, 20% and 50% of national income, which gives a Gini of 0.40.



The quintile shares give a Gini coefficient of 0.40

Poverty

- **Absolute poverty** 绝对贫困: income too low to buy basic needs. The World Bank's international poverty line is $3.00 a day per person (at 2021 PPP prices).
- **Relative poverty** 相对贫困: income far below others in the same country, often below 50% or 60% of the median income.
- The **Multidimensional Poverty Index** 多维贫困指数 (MPI) counts lack of health, education and living standards (such as clean water, electricity and cooking fuel), not only income.

Causes of inequality and poverty include differences in education and skills, inherited wealth, discrimination, unemployment, weak social protection, and tax systems that favour the rich. Globalisation and new technology have also raised the pay of highly

skilled workers faster than others.

Policies to reduce inequality

- **Progressive taxes** 累进税: richer people pay a higher share of their income. A **regressive tax** 累退税 takes a larger share from the poor (indirect taxes such as VAT often do). A proportional tax takes the same share from everyone.
- **Transfer payments** 转移支付: pensions, unemployment benefits and child benefits.
- Spending on education and health, so that poor children get the same chances.
- A minimum wage, and laws against discrimination.

Redistribution has costs: high marginal rates may reduce the reward for working or investing, and generous benefits can discourage some people from taking jobs. This is the trade-off between **equity** 公平 and **efficiency** 效率.

Monetary policy

The central bank and its tools

Monetary policy 货币政策 is run by the **central bank** 中央银行, such as the People's Bank of China or the US Federal Reserve. Many central banks have an **inflation target** 通胀目标, often 2%. Their tools:

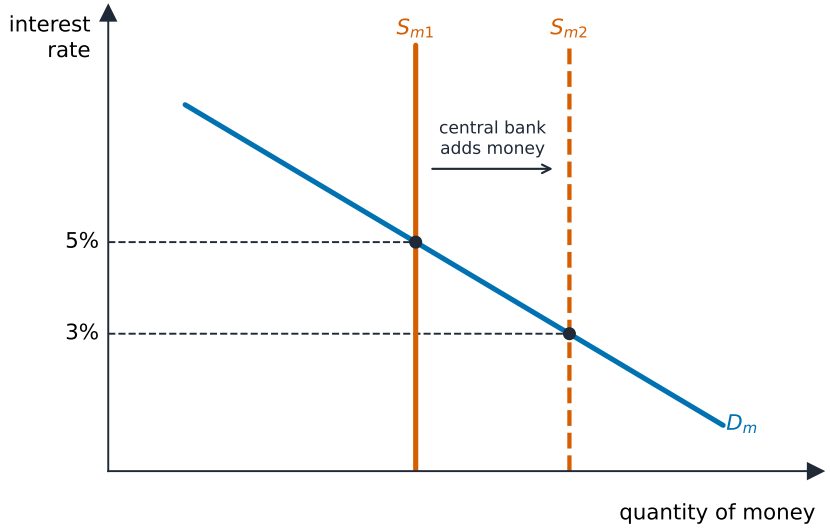


The European Central Bank: central banks set policy interest rates to steer aggregate demand and inflation

- the **policy interest rate** 政策利率 (the rate at which the central bank lends to commercial banks);
- **open market operations** 公开市场操作: buying or selling government bonds to change the money supply;
- **minimum reserve requirements** 存款准备金率: the share of deposits banks must keep and cannot lend. Lowering it lets banks lend more;
- **quantitative easing** 量化宽松 (QE): large-scale bond buying with newly created money, used when interest rates are already near zero.

The money market

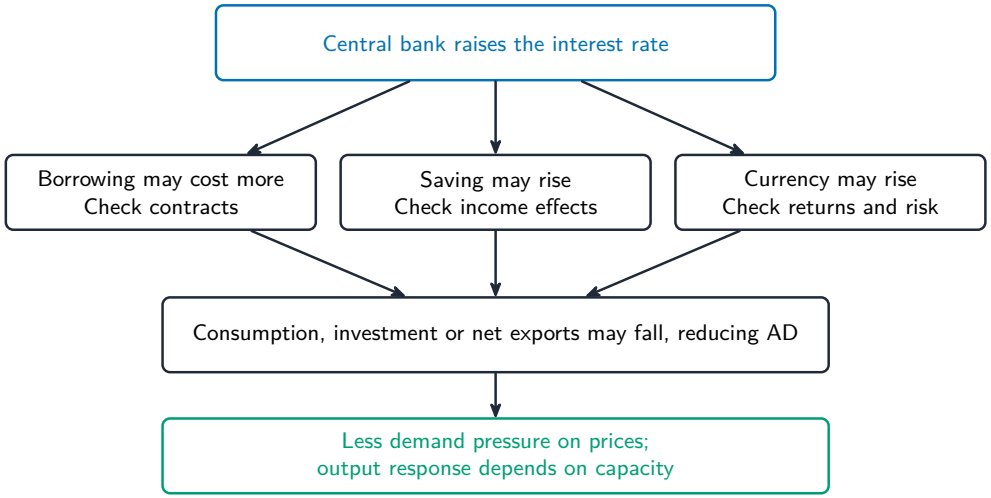
The interest rate is the price of money. The central bank controls the **money supply** 货币供给, shown as a vertical line. People's demand for money slopes down: at a high interest rate, holding cash means giving up a lot of interest.



More money supply lowers the equilibrium interest rate

The **real interest rate** 实际利率 is the nominal rate minus inflation. A loan at 5% when inflation is 3% costs only 2% in real terms.

How monetary policy reaches AD



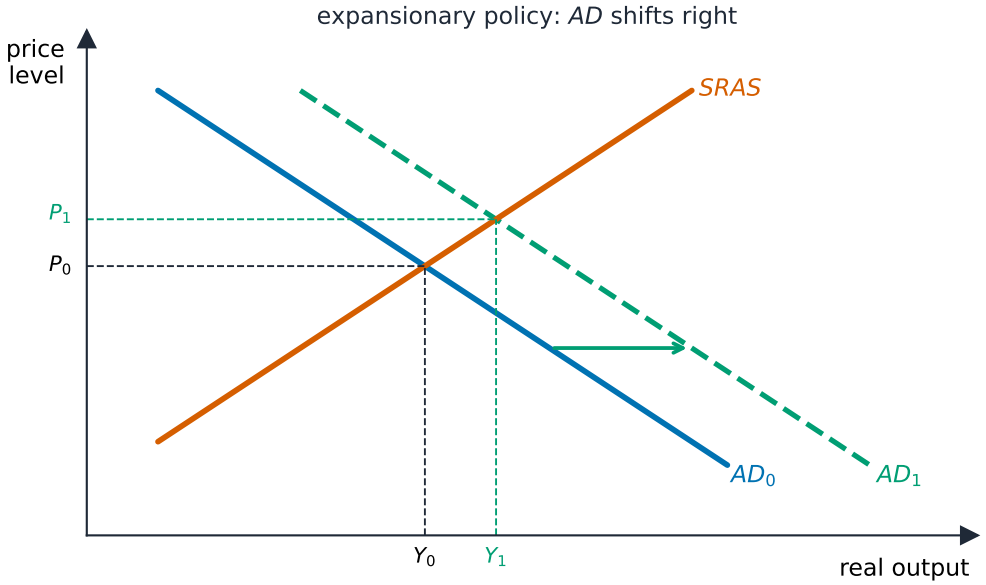
A rise in the interest rate reaches aggregate demand through several channels

Contractionary 紧缩性 (tight) monetary policy raises interest rates to fight inflation. Borrowing costs more, so households buy fewer homes and cars and firms invest less. Saving becomes more attractive. A higher rate also attracts money from abroad, so the currency rises and net exports fall. AD shifts left. **Expansionary** 扩张性 (loose) monetary policy cuts rates to fight a recession and works the other way.

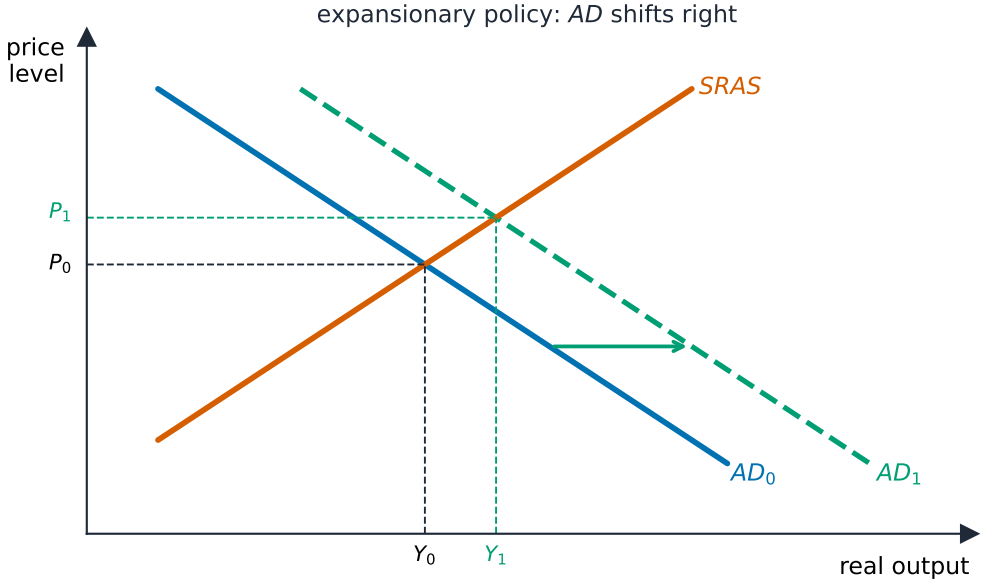
Strengths: central banks can act quickly, change rates in small steps, and are independent of politics. Limits: the full effect takes 18 months or more. In a deep recession, low confidence means people will not borrow even at very low rates. Rates cannot go far below zero, so QE is needed. And a rate rise cannot fix cost-push inflation without also cutting output.

Fiscal policy

Fiscal policy 财政政策 uses government spending and taxation to influence AD.



Expansionary fiscal policy shifts AD right, raising output and prices



Expansionary fiscal policy shifts AD right, raising output and prices

- Government revenue: **direct taxes** 直接税 (on income and profits), **indirect taxes** 间接税 (on spending, such as VAT), the sale of goods and services, and the sale of state-owned firms.
- Government spending: **current spending** 经常性支出 (wages of teachers and doctors, medicines), **capital spending** 资本性支出 (roads, schools, railways) and **transfer payments** (pensions, benefits).
- A **budget deficit** 预算赤字 means spending is greater than revenue; a **budget surplus** 预算盈余 means revenue is greater.

Expansionary fiscal policy raises G or cuts taxes, so AD shifts right. **Contractionary fiscal policy** cuts G or raises taxes to cool an inflationary gap.

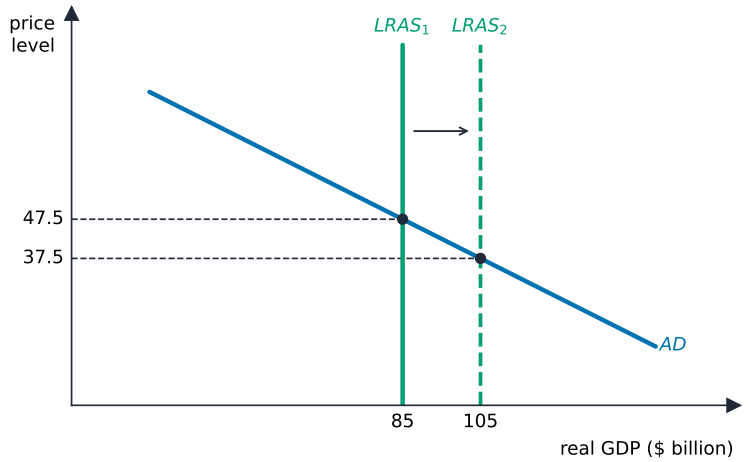
Automatic stabilisers 自动稳定器 work without any new decision. In a recession, tax revenue falls and benefit spending rises by itself, which supports AD. In a boom, the opposite happens and AD is held back.

Strengths: fiscal policy can target spending at particular regions or groups, works well in a deep recession, and capital spending also raises LRAS. Limits: **crowding out** 挤出效应 (government borrowing may raise interest rates and reduce private investment), long time lags (laws and projects take time), political pressure against cutting spending, and rising debt.

Supply-side policies

Supply-side policies 供给侧政策 aim to raise the economy's productive capacity, shifting LRAS to the right.

Reading the diagram. LRAS shifts from 85 to 105 along a fixed AD. The price level falls from 47.5 to 37.5 while real GDP rises by 20. Unlike demand-side policy, this gives growth without inflation.



Supply-side policy raises output and lowers the price level

Interventionist (the government acts)	Market-based (markets work more freely)
spending on education and training	lower income and business taxes to raise incentives
spending on healthcare	weaker trade union power, more flexible labour laws
infrastructure: roads, ports, broadband	lower or no minimum wage
grants for research and development	deregulation: removing unneeded rules
industrial policy: support for chosen industries	privatisation: selling state-owned firms
	competition policy: more rivals, lower prices

Strengths: supply-side policies can lower unemployment (especially structural), reduce inflation and raise long-run growth at the same time. Limits: most take years to work, education and infrastructure cost a lot of money, and market-based policies such as weaker labour laws can widen inequality.

Checklist

- The circular flow: leakages (S, T, M) and injections (I, G, X); GDP by the output, income and expenditure methods; GNI (3.1).
- Nominal and real GDP; per capita; PPP; the limits of GDP; HDI and other measures; the business cycle and output gaps (3.1).
- AD $= C + I + G + (X - M)$ with what changes each part; movements along and shifts of AD; SRAS and its shifters (3.2).
- Keynesian AS (flat, curving, vertical) against the monetarist vertical LRAS; LRAS shifters (3.2).
- Equilibrium at $(70, 55)$; a recessionary gap of 10 against full employment at 80; an inflationary gap at $(85, 62.5)$ (3.2).
- Unemployment: ILO definition, the rate, hidden unemployment, four types, the costs (3.3).
- Inflation, deflation and disinflation; the CPI and its limits; demand-pull and cost-push; the costs of each (3.3).
- Growth: short run from AD, long run from LRAS; sustainable growth (3.3).
- Inequality and poverty: income against wealth; the Lorenz curve and Gini coefficient; absolute and relative poverty, MPI; causes; progressive, regressive and proportional taxes; transfer payments; equity against efficiency (3.4).

- Monetary policy: central bank tools (policy rate, open market operations, reserve requirements, QE); the money market; real interest rates; transmission to AD; strengths and limits (3.5).
- Fiscal policy: revenue and spending types; deficits; expansionary and contractionary policy; automatic stabilisers; crowding out and other limits (3.6).
- Supply-side policies: interventionist and market-based; LRAS 85 → 105 with the price level 47.5 → 37.5; strengths and limits (3.7).

The global economy (4.1-4.10)

International Baccalaureate · IB Diploma · Economics · SL

The global economy

IB Diploma Programme Economics SL, Unit 4 *The global economy* (first assessment 2022). This topic covers the SL content of sections 4.1 to 4.10: why countries trade, how they protect their industries, trading blocs, exchange rates, the balance of payments, and economic development. The trade examples use one market, with demand $Q_d = 140 - 2P$ and domestic supply $Q_s = 20 + 4P$, at a world price of 12. All numbers are original. The trade and exchange-rate calculations, the Marshall–Lerner condition, the J-curve and the terms of trade are HL extensions, so they are left out here.



Container shipping: comparative advantage and trade let countries specialise and gain

In 1980 China opened its first special economic zone in Shenzhen, then a small town near Hong Kong. Foreign firms could build factories there and export to the world. Today Shenzhen is a city of more than 17 million people, and China is the world's largest exporter of goods. Over the same years, hundreds of millions of Chinese people left extreme poverty. This topic asks how trade causes growth like this, who loses from it, and why some countries still struggle to develop.

Must-know for this topic:

Idea	Key relationship
comparative advantage	specialise in the good with the LOWER opportunity cost
tariff (diagram)	price rises, imports fall, government revenue, deadweight loss
integration	free trade area → customs union → common market → economic and monetary union
exchange rates	floating, fixed or managed; demand and supply of a currency
balance of payments	current account + capital account + financial account = 0 (with errors and omissions)
development	sustainable development; HDI; barriers; strategies

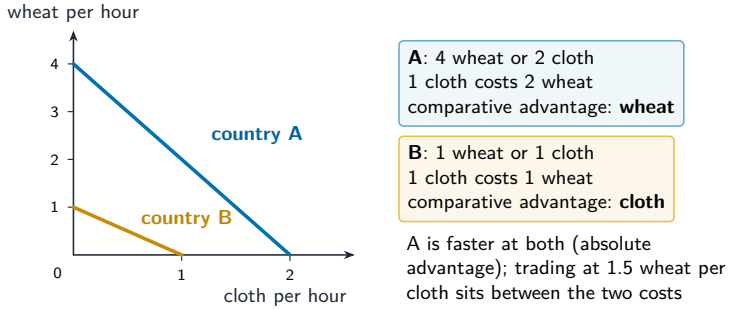
International trade

Why countries trade

International trade gives consumers lower prices and more choice. Firms can sell to bigger markets and gain **economies of scale** 规模经济. Competition from abroad pushes local firms to be more efficient. Trade also spreads new technology and ideas.

Absolute and comparative advantage

A country has an **absolute advantage** 绝对优势 in a good if it can make more of it with the same resources. It has a **comparative advantage** 比较优势 if it can make the good at a lower **opportunity cost** 机会成本. Trade is based on comparative advantage, not absolute advantage. Even a country that is better at making everything gains by specialising in the goods it makes at the lowest opportunity cost and importing the rest.

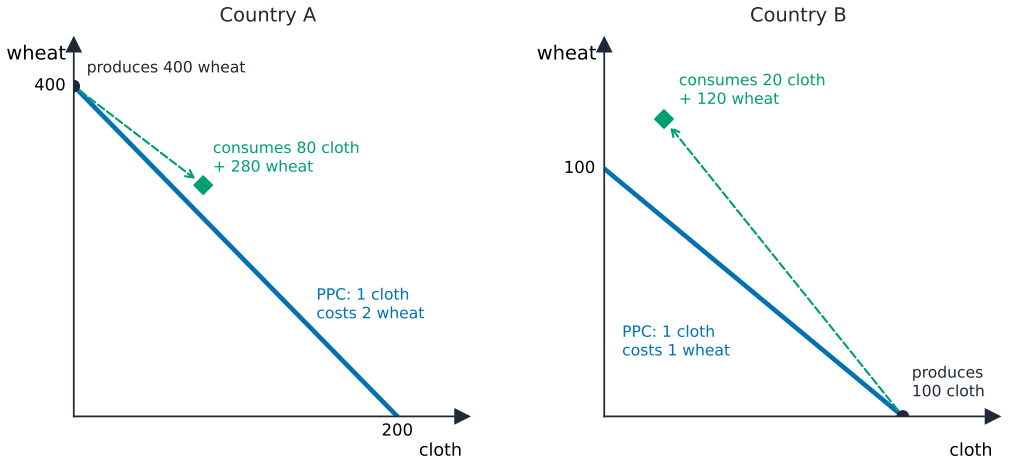


A: 4 wheat or 2 cloth
1 cloth costs 2 wheat
comparative advantage: **wheat**

B: 1 wheat or 1 cloth
1 cloth costs 1 wheat
comparative advantage: **cloth**

A is faster at both (absolute advantage); trading at 1.5 wheat per cloth sits between the two costs

Original data: output per labour hour; the trade ratio 1.5 wheat per cloth sits between the two opportunity costs.



With 100 workers each and a price of 1.5 wheat per cloth, both countries consume outside their own PPC

The theory has limits. It assumes no transport costs, constant opportunity costs, and workers who can move easily from one industry to another. In reality, the workers in a closing cloth factory may not find new jobs quickly. And a country may become too dependent on one or two goods.

The World Trade Organization

The **World Trade Organization** 世界贸易组织 (WTO), set up in 1995 and now with more than 160 members, sets rules for world trade. It runs rounds of talks to lower trade barriers, and it settles **trade disputes** 贸易争端 between members. Critics say its rules favour rich countries, and its dispute system has been weak since its appeals body stopped working in 2019.

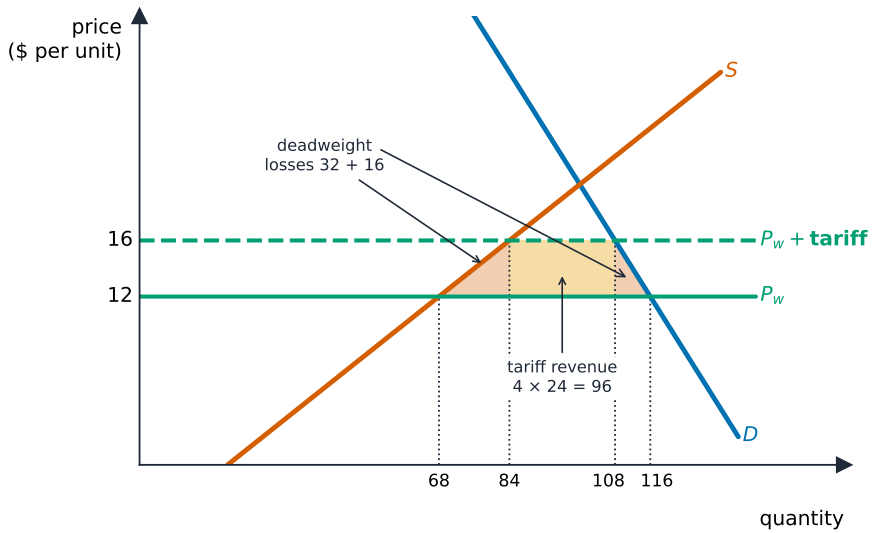
Trade protection

Trade protection 贸易保护 means government action that limits imports to help domestic producers. Most tools make foreign goods dearer or scarcer.

Types of protection

- **Tariffs** 关税: taxes on imports.
- **Quotas** 配额: limits on the quantity of a good that can be imported.
- **Production subsidies** 生产补贴: payments to domestic producers, which lower their costs.
- **Export subsidies** 出口补贴: payments to firms for each unit they export.
- **Administrative barriers** 行政壁垒: slow customs checks, strict product standards, or long paperwork that make importing harder.

The effects of a tariff



A tariff of 4 halves imports, raises 96 for the government and wastes 48

In the diagram, a tariff of 4 raises the domestic price from 12 to 16. Domestic firms produce more (84 instead of 68), consumers buy less (108 instead of 116), and imports fall from 48 to 24. Who gains and who loses? Consumers lose: they pay more and buy less. Domestic producers gain: they sell more at a higher price. The government gains revenue. Foreign producers lose sales. Society as a whole loses the deadweight loss.

A **quota** of 24 units would raise the domestic price to 16 in the same way. But there is no tariff revenue. The extra 4 per unit goes to whoever holds the import licences, often foreign firms. A **production subsidy** of 4 per unit would raise domestic output to 84 while the price stays at 12, so consumers do not lose. But the government must pay for it.

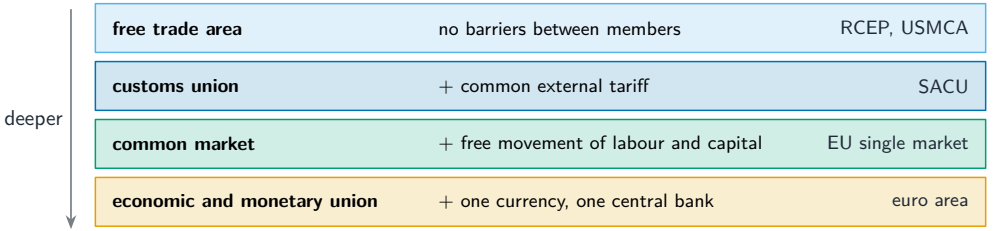
Arguments for and against protection

For protection	Against protection
protect an **infant industry** 幼稚产业 until it can compete	higher prices and less choice for consumers
protect jobs in industries facing cheap imports	other countries may **retaliate** 报复, leading to a trade war
stop **dumping** 倾销 (selling abroad below cost)	protected firms have little reason to become efficient
national security: food, energy, weapons	resources stay in industries without a comparative advantage
raise tax revenue (important in some low-income countries)	higher costs for firms that use imported inputs
diversification 多元化 away from a few exports	it can lead to corruption around licences

Many economists accept some of these arguments in a few cases, such as a real infant industry for a limited time. They reject most others, because the losses to consumers are usually larger than the gains to producers.

Economic integration

Countries can agree to lower barriers with each other. This is **economic integration** 经济一体化.



Each stage adds to the last

- A **bilateral** 双边 agreement is between two countries. A **multilateral** 多边 agreement is among many (such as the WTO's rules).
- A **preferential trade agreement** 优惠贸易协定 lowers barriers on some goods only.

Trading blocs 贸易集团 go further, in stages:

Stage	What members do	Example
free trade area 自由贸易区	no barriers between members; each keeps its own barriers against others	RCEP (China and 14 Asia-Pacific countries), USMCA
customs union 关税同盟	a free trade area plus a **common external tariff** 共同对外关税	Southern African Customs Union
common market 共同市场	a customs union plus free movement of labour and capital	the EU single market
economic and monetary union 经济与货币联盟	a common market plus one currency and one central bank	the euro area

Integration brings bigger markets, economies of scale, more competition and more investment. But it can also cause **trade diversion** 贸易转移: a member buys from a higher-cost partner inside the bloc instead of a lower-cost country outside it. When integration lets a member buy from a lower-cost partner instead of its own higher-cost producers, that is **trade creation** 贸易创造, which raises efficiency.

A monetary union removes exchange-rate costs and risks, and makes prices easy to compare. But each member loses its own interest rate and exchange rate. In the euro crisis after 2010, countries such as Greece could not devalue or cut interest rates to escape recession.

Exchange rates

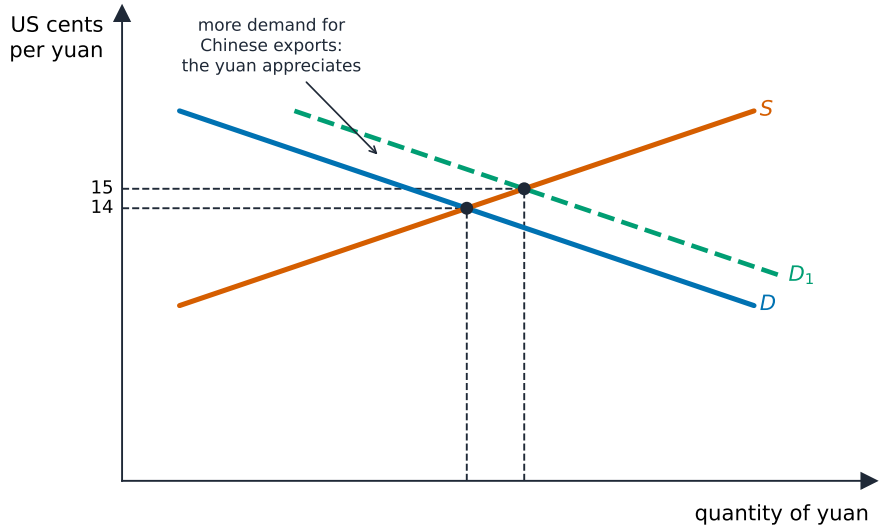
What sets the exchange rate

The **exchange rate** 汇率 is the price of one currency in another currency. Under a **floating exchange rate** 浮动汇率, demand and supply in the foreign exchange market set it.



A currency exchange board: exchange rates are set by the demand for and supply of each currency

- Demand for yuan comes from foreigners buying Chinese exports, tourists visiting China, and foreign investors buying Chinese assets.
- Supply of yuan comes from Chinese people and firms buying imports, travelling abroad, and investing abroad.



More demand for Chinese exports raises the demand for yuan, so the yuan appreciates

A rise in a currency's value is an **appreciation** 升值; a fall is a **depreciation** 贬值.

The exchange rate changes when:

- foreign demand for a country's exports changes;
- interest rates change (higher rates attract **hot money** 热钱, short-term money looking for the best return);
- inflation differs between countries (high inflation makes exports less competitive);
- investors **speculate** 投机 that a currency will rise or fall;
- the central bank buys or sells its own currency.

Effects of a change

If the yuan appreciates, Chinese exports become dearer abroad and imports become cheaper in China. Exporters may lose sales, but import prices and inflation fall. A depreciation does the opposite: it helps exporters but raises the price of imported fuel and food.

Fixed and managed systems

- Under a **fixed exchange rate** 固定汇率, the government or central bank sets the currency's value against another currency and buys or sells to keep it there. The Hong Kong dollar has been fixed to the US dollar since 1983. A deliberate cut in a fixed rate is a **devaluation** 法定贬值; a deliberate rise is a **revaluation** 法定升值.
- A **managed exchange rate** 有管理的浮动汇率 floats, but the central bank steps in to limit big moves. The People's Bank of China sets a daily central rate and lets the yuan move only within a band around it.

Fixed rates give certainty to traders and investors. But the central bank must hold large **foreign currency reserves** 外汇储备, and it gives up control of its own interest rate. Floating rates adjust by themselves, but they can swing sharply and make planning hard.

The balance of payments

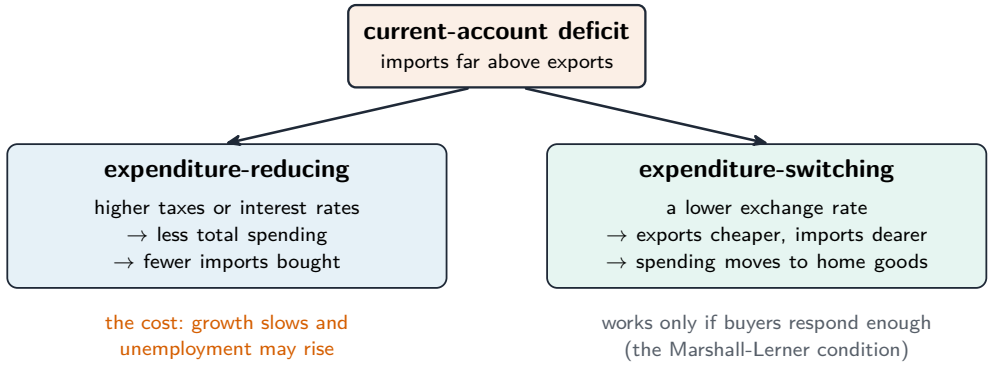
The **balance of payments** 国际收支 records all of a country's money transactions with the rest of the world in one year.

Account	What it records
current account 经常账户	trade in goods and in services; **primary income** 初次收入 (wages, profits, interest and dividends from abroad); **secondary income** 二次收入 (transfers such as money workers send home, and foreign aid)
capital account 资本账户	small items such as debt forgiveness and the sale of patents or land
financial account 金融账户	**foreign direct investment** 外国直接投资 (FDI), **portfolio investment** 证券投资 (buying shares and bonds), changes in reserve assets

The accounts must add to zero. So a current account deficit is matched by a surplus on the capital and financial accounts: the country pays for extra imports by borrowing or by selling assets to foreigners.

Current account deficits and surpluses

A small deficit can be harmless, for example if it pays for imported machines that raise output later. A large, long-lasting deficit is a problem. The country builds up foreign debt, may need higher interest rates to attract money, and its currency may fall suddenly.



Two routes out of a deficit: spend less overall, or switch spending to home goods

Policies to reduce a deficit:

- **Expenditure-switching policies** 支出转换政策 move spending from imports to domestic goods: protection, or a lower exchange rate.
- **Expenditure-reducing policies** 支出削减政策 cut total spending, and so imports: contractionary fiscal or monetary policy. These can cause unemployment.
- **Supply-side policies** make exports more competitive over the long run.

A persistent surplus can also cause problems: a rising currency, less consumption at home, and trade disputes with deficit countries.

Economic development

Sustainable development

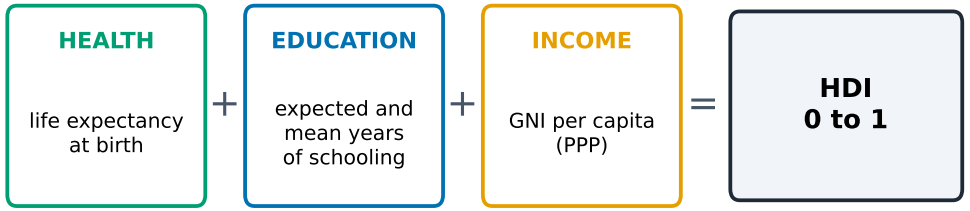
Economic development 经济发展 is broader than growth. It means better living standards: less poverty, better health and education, more freedom and choice. **Sustainable development** 可持续发展 meets the needs of people today without harming the ability of future generations to meet their own needs. In 2015 the United Nations agreed 17 **Sustainable Development Goals** 可持续发展目标 (SDGs) for 2030, including no poverty, zero hunger, quality education, clean water and climate action. Poverty and environmental damage are linked: very poor people may have no choice but to cut forests or overuse land.



A busy market in a fast-growing economy: growth raises output, development asks whether lives improve

Measuring development

Type	Measures	Limits
single indicators	GDP or GNI per capita at PPP; life expectancy; infant mortality; years of schooling	each shows only one side of development
composite indicators 综合指标	the **Human Development Index** 人类发展指数 (HDI): income (GNI per capita at PPP), health (life expectancy) and education (years of schooling), on a scale from 0 to 1	HDI hides inequality and the environment
adjusted indices	the **Inequality-adjusted HDI** 不平等调整后人类发展指数 (IHDI) and the **Gender Inequality Index** 性别不平等指数 (GII)	data can be old or poor in low-income countries

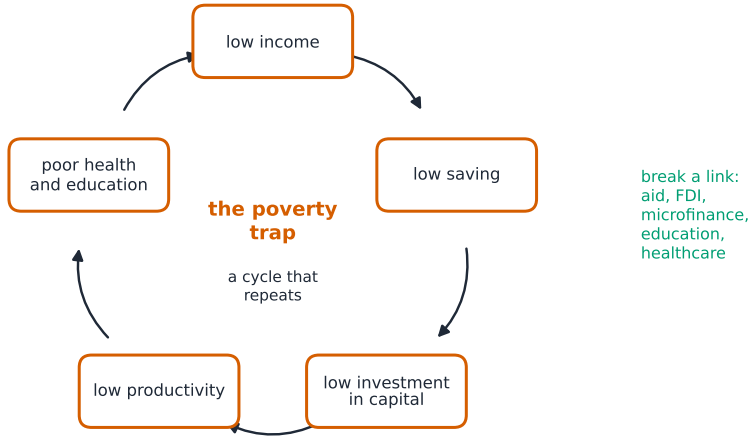


GDP alone misses health and schooling; the GII adds gender inequality

The Human Development Index combines health, education and income

A country whose HDI rank is much higher than its GNI rank turns its income into health and education well. A country whose HDI rank is much lower may have high income from oil but poor public services or great inequality.

Barriers to development



Each link in the poverty trap keeps the next one weak

- The **poverty trap** 贫困陷阱: people with low incomes cannot save, so there is little money for investment, so productivity and incomes stay low.
- **Economic barriers**: high inequality; poor infrastructure (roads, power, internet); little access to credit and markets; a large informal economy that pays no taxes; **capital flight** 资本外逃 (rich people moving money abroad); and unsustainable foreign debt.
- **Dependence on primary products**: for example, copper makes up most of Zambia's exports, so a fall in the world copper price cuts national income sharply.
- **Geography**: being **landlocked** 内陆的 raises transport costs; tropical disease and climate shocks hurt health and farming.
- **Political and social barriers**: weak institutions, corruption, poor legal and property rights, political instability and conflict, and **gender inequality** 性别不平等 (when girls cannot go to school, half the country's talent is wasted).

Strategies for development

Strategy	How it helps	Problems
export promotion 出口导向	uses comparative advantage; China, South Korea and Singapore grew this way	depends on world demand; may need cheap labour
import substitution 进口替代	protects new domestic industries (Latin America, 1950s–1980s)	firms stayed inefficient; high prices for consumers
diversification	less risk from one export price	needs skills and investment
foreign direct investment (FDI) by **multinational corporations** 跨国公司	brings capital, jobs, technology and skills	profits leave the country; firms may use low wages or weak environmental rules
foreign aid 对外援助	grants and cheap loans for health, schools and emergencies	can be tied to the donor's goods; corruption; dependency
multilateral help (World Bank, IMF)	long-term loans; help in a crisis	loan conditions may force spending cuts
debt relief 债务减免	frees money for schools and hospitals	may encourage new borrowing
microfinance 小额信贷	small loans to people banks ignore, often women (the Grameen Bank)	high interest rates; loans may pay for consumption, not business
fair trade 公平贸易	guaranteed minimum prices for farmers	reaches only a small share of producers
better institutions, education and health	raise productivity and attract investment	take many years and need good government

Most successful countries have used a mix: market reforms and open trade, together with strong government investment in education, health and infrastructure. Every strategy should be judged by the barrier it removes, and by whether the gains are equal and sustainable.

Checklist

- The benefits of trade; absolute against comparative advantage; the limits of the theory; the WTO (4.1).
- Tariffs, quotas, production and export subsidies, administrative barriers; the tariff diagram: price, imports, revenue and deadweight loss; who gains and who loses; quota and subsidy compared (4.2).
- The arguments for and against protection, with evaluation (4.3).
- Bilateral, multilateral and preferential agreements; free trade area, customs union, common market, economic and monetary union with examples; trade creation and trade diversion; the costs of a monetary union (4.4).
- Floating, fixed and managed exchange rates; what shifts the demand and supply of a currency; appreciation and depreciation and their effects; devaluation and revaluation; reserves (4.5).
- The current, capital and financial accounts; why they balance; the problems of persistent deficits and surpluses; expenditure-switching, expenditure-reducing and supply-side corrections (4.6).
- Development against growth; sustainable development and the 17 SDGs (4.7).
- Single and composite indicators: GNI per capita at PPP, HDI, IHDI, GII; comparing HDI and GNI ranks (4.8).
- Barriers: the poverty trap, economic barriers, primary-product dependence, geography, political and social barriers (4.9).
- Strategies: export promotion, import substitution, diversification, FDI, aid, multilateral help, debt relief, microfinance, fair trade, institutions and human capital, each with its problems (4.10).