

Cambridge AS & A Level · Economics 9708 · Notes

Economic growth and sustainability A2

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Read first: [Economic growth](#), [The circular flow of income](#), [Supply-side policy](#)

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What you need to know

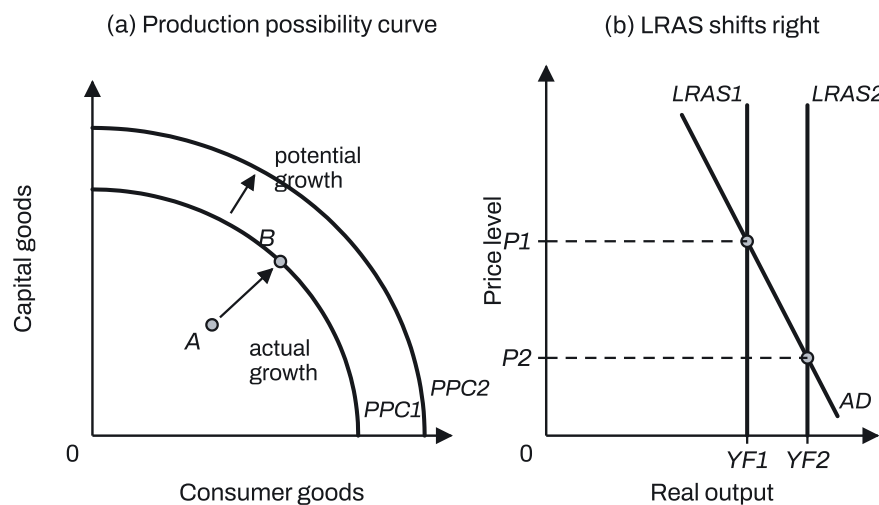
This topic builds on AS Economic growth. By the end of it you should be able to:

1. **Tell actual growth from potential growth:** actual growth is a rise in real output (real GDP); potential growth is a rise in the economy's productive capacity, the most it could produce with all its resources fully used.
2. **Explain positive and negative output gaps:** the difference between actual output and potential output, which way round it is, and what each means for unemployment, inflation and the current account.
3. **Explain the business (trade) cycle:**
 - its **phases**: boom, downturn (recession), trough (slump) and recovery;
 - its **causes**: why aggregate demand and output swing above and below trend;
 - the **automatic stabilisers**: how progressive taxes and benefits damp the swings without any new government decision.
4. **Evaluate policies to promote economic growth:** demand-side policies (fiscal, monetary, exchange rate) for actual growth and supply-side policies for potential growth, and how effective each is likely to be.
5. **Explain inclusive economic growth:**
 - what it means;
 - how growth can make equity and equality better or worse;
 - which policies spread the gains from growth more widely.
6. **Explain sustainable economic growth:**
 - what it means;
 - the difference between using up resources and conserving them;
 - how growth affects the environment and climate change;
 - which policies reduce that damage.

Understand it

Actual and potential growth

Actual growth is an increase in real GDP: the economy really produces more. **Potential growth** is an increase in **productive capacity**: the economy *could* produce more, because it has more or better land, labour, capital and enterprise, or better technology.



- On a **production possibility curve (PPC)**, actual growth is a move from a point **inside** the curve towards the curve (A to B): unemployed resources start working. Potential growth is an **outward shift** of the whole curve. A move along a given curve is only a change in what is produced, not growth.
- On an **AD/AS diagram**, actual growth is a rise in real output, usually from AD shifting right while there is spare capacity. Potential growth is the **LRAS shifting right**.
- **Trend growth** is the long-run average rate at which potential output grows, typically 2–3% a year in high-income economies.

The two are linked. An economy can only grow **faster** than its trend for a while, by using up spare capacity. Once actual output reaches potential (the vertical part of the LRAS, or the PPC itself), more demand mainly raises prices; growth can then continue only as fast as capacity grows. In the other direction, investment, education and research that raise demand today also add capacity tomorrow.

What raises potential output: more labour (population growth, migration, more women or older people working), more and better capital (investment, infrastructure), better human capital (education, training, health), new technology and innovation (R&D), and better ways of combining them (competition, enterprise, efficient institutions). What lowers it: emigration of skilled workers, an ageing population leaving the workforce, war or disasters destroying capital, and resources running out.

Output gaps

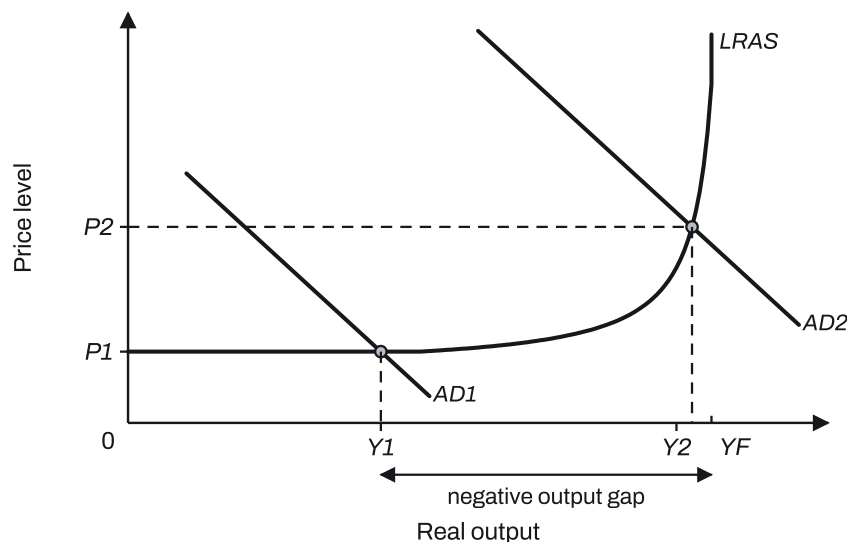
The **output gap** is the difference between actual output and potential output:

output gap = actual output – potential output, as a % of potential = $\frac{\text{actual} - \text{potential}}{\text{potential}} \times 100$

If potential output is \$800bn and actual output is \$760bn, the gap is –40bn, or –5% of potential. If actual output is \$820bn, the gap is +2.5%.

- **Negative output gap** (actual below potential): spare capacity. Firms have idle machines; there is **cyclical (demand-deficient) unemployment**; inflation is low or falling; business confidence is weak; imports are low, so the current account tends to improve. This is also called a **deflationary gap**.
- **Positive output gap** (actual above potential): resources are **over-used**. Firms run plants beyond their most efficient level, workers do overtime (so they have **less leisure**), and labour shortages push up **wages**. Costs and excess demand push the **price level up**; extra spending sucks in **imports**, worsening the current account. Spare capacity is **falling**. This is an **inflationary gap**.

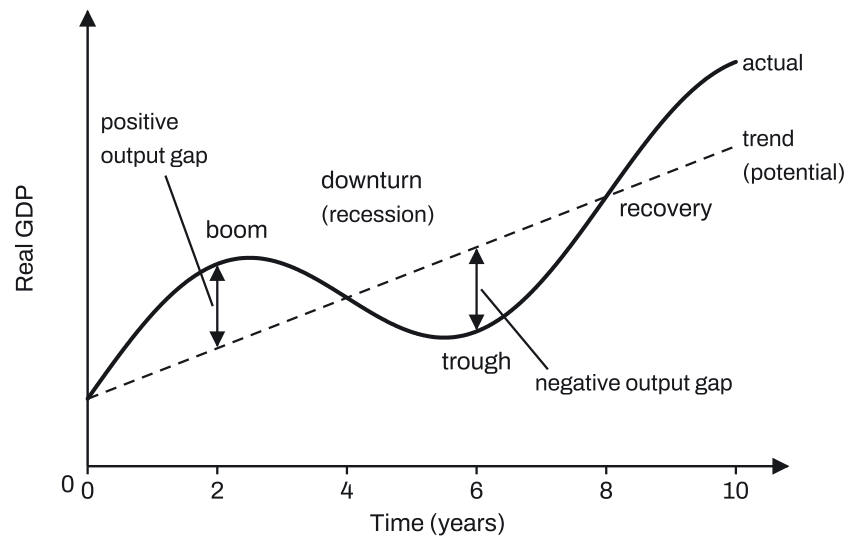
Actual output above potential sounds impossible, but potential output is a sustainable level, not a physical maximum: for a time, overtime, extra shifts and putting off maintenance let output exceed it.



On this AD/AS diagram, the gap is measured **horizontally**, between the output where the current AD meets AS and the full employment output Y_F . If both AD and AS shift, use the **new** curves. With a big negative gap, a rise in AD raises output with little inflation; as the gap closes, the same rise in AD causes more inflation and less extra output.

The business (trade) cycle

Real GDP does not grow smoothly. It swings around its trend in the **business cycle** (or trade cycle).



Phase	Growth	Output gap	Unemployment	Inflation
Boom (peak)	fast, above trend	positive and largest	low, labour shortages	rising
Downturn , which becomes a recession if real GDP falls	slowing, then negative	shrinking, then negative and widening	rising	slowing
Trough (slump)	lowest point	negative and largest	high	low, maybe falling prices
Recovery (upturn, expansion)	positive and rising	negative but closing	starting to fall	starting to rise

A **recession** has a precise meaning: **real GDP falls for two or more quarters in a row** (two consecutive quarters of negative growth). Slower but still positive growth is a downturn, not a recession. To count recessions on a chart of quarterly growth, look for runs of **at least two** negative bars. Take the quarterly growth rates 0.6, 0.4, −0.2, −0.5, 0.1, −0.3, 0.2, −0.4, −0.1, −0.6, 0.3 (%): the runs of negatives are 2 quarters, 1 quarter and 3 quarters long, so there were **2** recessions; the single negative quarter does not count.

On a chart of the **level** of GDP, a recession is a period where the line **falls**; on a chart of the **growth rate**, it is a period where the line is **below zero**, not merely falling.

Causes of the cycle

Most swings start with **aggregate demand**, then spread through the economy.

- **Investment is volatile.** It depends on expected profits, confidence and the change in demand. The **multiplier** turns a fall in investment into a bigger fall in income; the **accelerator** turns slower income growth into a fall in investment. Together they can make a small shock into a recession, and a recovery into a boom.

- **Confidence and expectations.** Households and firms spend more when they feel secure; when they become pessimistic, they save more and delay buying, and the fall in demand makes the pessimism come true.
- **Credit and asset prices.** Cheap borrowing and rising house and share prices feed a boom; when debts are called in or a bubble bursts, spending collapses (as in 2008).
- **Stocks (inventories).** In a downturn, firms sell from their stocks rather than produce; once stocks are low, production picks up again.
- **Government and central bank policy.** Sharp rises in interest rates or cuts in spending can cause a downturn; some governments spend more before elections.
- **External shocks.** A recession in major trading partners cuts exports; oil and food price rises cut real incomes and raise costs; pandemics, wars and natural disasters hit both demand and supply.

Automatic stabilisers

Automatic stabilisers are parts of the tax and benefit system that reduce the swings of the cycle **without any new decision** by the government:

- **Progressive income tax:** as incomes fall, people drop to lower tax rates, so tax paid falls **faster** than income; as incomes rise, it rises faster.
- **Means-tested (income-related) benefits:** unemployment benefit and income support are paid to more people when unemployment rises, and to fewer in a boom.

In a **downturn**, tax revenue falls and benefit spending rises, so households' **disposable income falls by less than their pay**, which cushions consumption and AD. The **budget deficit widens automatically**, even with tax rates and benefit rates unchanged. In a **boom**, tax revenue rises and benefit spending falls, taking demand out of the economy and narrowing the deficit.

Example: tax is 25% of weekly pay above \$200. A worker's pay falls from \$1000 to \$800 (a 20% fall). Tax falls from \$200 to \$150, so take-home pay falls from \$800 to \$650, a fall of \$150 rather than \$200. The average tax rate falls from 20% to 18.75%. Universal (flat-rate, not means-tested) benefits and regressive taxes do much less.

Discretionary fiscal policy is different: it is a deliberate change in tax rates or government spending. Stabilisers act at once; discretionary policy suffers from time lags, but can be larger.

Policies to promote growth, and how effective they are

Which policy fits depends on the cause: **a negative output gap needs more demand; slow trend growth needs more capacity.**

Demand-side policies (actual growth, closing a negative gap)

- **Expansionary fiscal policy:** higher government spending or lower taxes raise AD; the **multiplier** raises income by more than the injection. Spending on infrastructure, education or health also adds capacity.

- **Expansionary monetary policy:** lower interest rates, or more money through quantitative easing, make borrowing cheaper, so investment and consumer spending (especially on credit) rise.
- **Exchange rate policy:** a lower exchange rate makes exports cheaper and imports dearer, so net exports rise (**export-led growth**).

How effective? They work best with a **large negative output gap**, a **large multiplier** and **confident** households and firms. They work less well when:

- the economy is **near full capacity** (the steep or vertical part of the LRAS): extra demand mostly raises **inflation**, and pushes the economy up the short-run Phillips curve;
- confidence is low, so lower interest rates do not raise investment (a **liquidity trap**, or investment that is **interest inelastic**);
- government borrowing raises interest rates and **crowds out** private investment, or debt is already so high that lenders demand more;
- a depreciation does not improve the trade balance (the **Marshall–Lerner** condition fails, or exporters have no spare capacity) and imported inflation follows;
- a high marginal propensity to import leaks the extra spending abroad, worsening the current account;
- **time lags** mean the policy takes effect after the economy has already recovered.

Supply-side policies (potential growth)

- **Education and training:** more productive workers, fewer skill shortages (an increase in human capital).
- **Infrastructure:** roads, ports, power, broadband cut firms' costs and open new markets.
- **Incentives to invest and innovate:** tax allowances for investment and R&D, grants, protection of patents.
- **Labour market reforms:** lower income tax rates, reformed benefits and training to raise the incentive to work; immigration of skilled workers.
- **Competition and markets:** privatisation, deregulation and competition policy push firms to be efficient; encouraging **foreign direct investment** brings capital and technology.

How effective? They raise growth **without** raising inflation, because capacity rises with output. But they are slow (a better-educated workforce takes a decade), costly to the government budget, and uncertain: tax cuts may not raise effort, and FDI profits may leave the country. Some (weaker trade unions, cuts in benefits, privatisation) can raise inequality, and growth in capacity may use more resources and cause more pollution. They do little to cure a recession quickly, because the problem then is demand, not capacity.

A good answer usually concludes that **both** are needed: demand-side policy to close a negative output gap in the short run, supply-side policy to raise the trend rate of growth in the long run.

Inclusive economic growth

Inclusive economic growth is growth that creates opportunities for **all** groups in society and shares the gains, in income and in things like health and education, **fairly** across the population, not only among the rich or one region.

Growth can affect **equity** (fairness) and **equality** (how evenly income and wealth are spread) either way:

- **It can reduce poverty and inequality:** more jobs reach the unemployed and low-skilled; higher tax revenue pays for schools, clinics and benefits.
- **It can increase inequality:** the gains may go mainly to owners of capital and to skilled workers in growing industries and cities, while rural areas, women, the low-skilled and minorities are left behind; asset prices (housing) rise faster than wages. Rising real GDP per head can then hide falling living standards for many. The Gini coefficient rising during growth is a sign of this.

Policies to promote inclusive growth spread opportunity and income:

- free or subsidised **education and health care**, so everyone can take part in the growing sectors;
- **progressive taxes and transfer payments** (benefits, pensions, cash transfers) to redistribute income;
- a **national minimum wage**, and laws against discrimination;
- **infrastructure** in poor regions (transport, power, internet), so those areas can trade and attract firms;
- access to finance for small firms and the poor (microfinance), and help for women to enter work.

Policies that weaken workers' bargaining power, such as **reducing the power of trade unions**, or that cut benefits for the poor, are least likely to make growth inclusive, even if they raise growth.

Sustainable economic growth

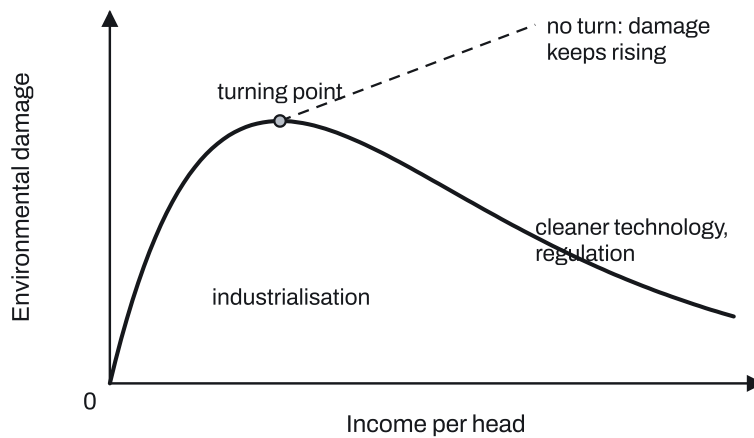
Sustainable economic growth is growth that meets the needs of people today **without reducing the ability of future generations to meet their own needs**. It raises living standards over the long term without damaging the environment or using up the resources that future output depends on.

Using and conserving resources

- **Renewable resources** (fish stocks, forests, soil, water) regrow if used no faster than they renew. Over-fishing or clearing forest gives a burst of output now and less later.
- **Non-renewable resources** (oil, coal, gas, minerals) are used up when extracted. Using them raises GDP now, but the stock left for the future falls.
- **Conserving** resources means using them efficiently, recycling, switching to renewables, and setting limits on how much is taken (fishing quotas, logging limits, protected areas). Fish farming instead of bigger catches, or recycled materials instead of new ones, let an industry grow without running down its resource.

The impact of growth on the environment and climate change

More production usually means more energy use, more **greenhouse gas emissions** (carbon dioxide from burning fossil fuels), more air and water **pollution**, more waste, and loss of forests and wildlife. These are **negative externalities**: the producer and consumer do not pay the full social cost, so the market produces too much of the damaging good. **Climate change** (higher temperatures, more floods, droughts and storms) then damages future output, health and living standards, often hitting poor countries hardest.



Some economists argue that damage first rises with income, then falls once countries are rich enough to demand a cleaner environment and afford cleaner technology (an inverted U, sometimes called the environmental Kuznets curve). This is not guaranteed: if growth keeps depending on fossil fuels and pollution keeps rising with real GDP, the curve never turns.

Policies to reduce the impact of growth on the environment and climate change

Market-based (change prices and incentives)

Carbon and pollution taxes: make polluters pay the external cost, so they cut emissions

Tradable pollution permits (cap and trade): a fixed total of emissions; firms that cut cheaply sell spare permits

Subsidies for renewable energy, insulation, public transport and electric vehicles

Removing subsidies on fossil fuels

Regulatory (rules)

Emission standards and limits on pollution per firm or per car

Bans (on coal plants, single-use plastics, petrol cars after a date)

Quotas on fishing and logging; protected land

Building and energy-efficiency rules

Others: government spending on **green technology** and research, information campaigns, and **international agreements**, since climate change is a global problem and one country cutting emissions alone has little effect if others do not. Each has costs: carbon taxes raise prices and can be regressive; permits need careful setting of the cap; regulation needs monitoring; and a country may refuse to cut its use of cheap coal because it fears slower growth and job losses.

Key facts and formulas

There is no formula list in the 9708 exam, so everything here is "Learn it".

Formula	Status
Output gap = actual output – potential output (negative: spare capacity; positive: over-used capacity)	Learn it

Formula	Status
Output gap as a percentage = $\frac{\text{actual} - \text{potential}}{\text{potential}} \times 100$	Learn it
Recession: real GDP falls for two or more consecutive quarters	Learn it
Real growth $\approx$ nominal growth – inflation	Learn it
Growth of real GDP per head $\approx$ real growth – population growth	Learn it
Real GDP = nominal GDP $\times \frac{100}{\text{price index}}$	Learn it
Automatic stabilisers: progressive taxes and means-tested benefits; in a downturn tax revenue falls, benefit spending rises and the budget deficit widens	Learn it

How to do it

We tagged 76 questions for this topic, from March 2021 to March 2026 (70 different; 6 are repeats across paper variants): 51 Paper 3 multiple choice and 25 Paper 4 essays and data-response questions. 10 of them have parts of more than one type, so the counts add up to 87.

Question type	Questions
Identify an output gap and its effects	15
Define sustainable growth and judge which policy or cause is sustainable	15
Evaluate a policy for promoting growth	13
Distinguish actual from potential growth	10
Weigh the costs and benefits of growth	8
Identify recessions and trade-cycle phases from data	7
Explain causes of growth and productivity from information	7
Measure growth from data (real, nominal, per head)	6
Explain automatic stabilisers and the budget over the cycle	5
Pick a policy that promotes inclusive growth	1

1. Identify an output gap and its effects (15 questions)

Mostly multiple choice; two essays.

1. **Decide the sign:** actual below potential is a **negative** gap; actual above potential is **positive**. The gap is measured between **actual** output and **potential** output (not the full employment of labour alone).
2. **Predict the effects** from the table in "Understand it":
 - **positive:** inflation and the general price level rise, wages rise, imports rise, spare capacity and workers' **leisure time fall**;
 - **negative:** unemployment rises, inflation falls, business confidence falls, the growth rate is below trend.
3. **Link to the cycle:** an **increasing negative** gap means output is falling further below potential, which is a **recession**; the largest negative gap is at the trough; a positive gap goes with a boom and above-trend growth.

Variants:

- **AD/AS diagram with shifting curves:** find the output where the **new** AD meets the **new** AS, then measure horizontally to full employment output.
- **Several diagrams of one economy** (PPC, LRAS, trend GDP): look for a point inside the PPC, an equilibrium left of the vertical LRAS, or actual GDP below trend; all show a negative gap.
- **Essays** (20 or 25 marks) on fiscal policy or budget deficits: define the gap, draw it (AD/AS, PPC or a trade-cycle diagram), and argue that expansionary policy suits a negative gap but is unwise with a positive one. Evaluate with the size of the multiplier, crowding out, inflation and whether the unemployment is cyclical or structural (follow the plan in type 3).

2. Define sustainable growth and judge which policy or cause is sustainable (15 questions)

Mostly multiple choice; one data-response question.

1. **Definition:** growth that raises living standards now **without reducing future generations' ability** to meet their needs. Reject definitions about only actual output, only productive potential, or every single person being better off.
2. **Which policy or cause is sustainable?** Pick the option that **conserves or renews** resources or raises productivity without using up resources: training, technology, recycling subsidies, fish farms, renewable energy. Reject options that run down a resource for faster output now: bigger nets and catch bonuses, clearing rainforest, using every natural resource as fast as possible, rapid population growth.
3. **Market-based or regulatory?** Taxes, permits and subsidies change prices (market-based); emission standards, bans and quotas are rules (regulatory).
4. **Damage that keeps rising with GDP** is why an economy may not reach the turning point of the inverted U.

Data response (2 + 4 + 4 marks): define sustainability and pick **one example from the extract** of a change that shows it (2). For "comment on the effects" of keeping a polluting energy source, make paired points (point (1), development (1)) on both sides: cheap, reliable power keeps output and growth up; but the resource is finite, switching later costs more, and the pollution is a negative externality.

3. Evaluate a policy for promoting growth (13 questions)

Paper 4 essays (20 marks since 2023; 12- and 13-mark parts or 25-mark questions in 2021–2022) and one data-response part. Questions name fiscal policy, monetary policy, a bigger budget deficit, government spending, foreign borrowing, multinationals, infrastructure, or "increasing potential growth".

Plan (Table A, knowledge and analysis, 14 marks; Table B, evaluation, 6 marks):

1. **Define** the terms in the question: economic growth (rise in real GDP over time), actual and potential growth, the policy (budget deficit: government spending above tax revenue; monetary policy: interest rates, money supply, exchange rate).
2. **Draw** an accurate, labelled diagram and refer to it: AD/AS with AD shifting right for demand-side policy; LRAS shifting right (or the PPC shifting out) for supply-side policy. When the question says "with the help of a diagram", no diagram caps the mark.
3. **Analyse 2–3 developed chains**, each: policy → which component of AD or which factor of production changes → output and income → growth. For example: lower interest rates → cheaper borrowing → more investment and spending on credit → AD rises → firms produce more → real GDP rises, multiplied by the multiplier. For potential growth, analyse **at least two** supply-side policies (training, infrastructure, R&D, FDI, competition), each with its route to higher productivity and capacity.
4. **Evaluate** with **at least 3 developed points** (from the lists under "How effective?"): spare capacity and inflation; size of the multiplier; confidence, liquidity trap and interest-inelastic investment; crowding out, debt and borrowing costs; time lags; the Marshall–Lerner condition; for supply-side policy, cost, slowness, political resistance, shortages of resources, inequality and the environment; short run against long run.
5. **Conclude** on the question's words ("always", "effective", "to what extent"): say when the policy works, and when another policy would be better.

4. Distinguish actual from potential growth (10 questions)

Multiple choice, data-response parts and essays.

1. **Actual growth**: a rise in real output; a move from inside the PPC towards it, or along the AS curve as AD rises.
2. **Potential growth**: a rise in capacity; the PPC shifts **out**, the LRAS shifts **right**. Only an outward shift "definitely" shows long-run growth.
3. **Limits**: an economy on the vertical part of the LRAS cannot grow faster by raising demand; only capacity growth helps.

Variants:

- **Data response with a PPC** (4 marks): labelled axes (two goods) (**1**), the correct shift drawn and labelled PPC1 to PPC2 (**1**), then explain each change in the extract: fewer workers (emigration, retirement, migration halted) shift the PPC **in** or leave it unchanged; new resources, investment or infrastructure shift it **out** (1 each).

- **"Growth can only occur below full employment"** (essay): below full employment, AD-led growth uses spare capacity (actual growth) with little inflation; at full employment, growth still happens through LRAS shifting right (potential growth), driven by productivity, technology, education and investment, while extra AD there causes mainly inflation. Define **full employment**: the economy is producing at its capacity, and everyone willing to work at current wages has a job apart from those in frictional or structural unemployment. Judge: the statement is only **partly** true. Draw both an AD shift along the AS curve and an LRAS shift.

5. Weigh the costs and benefits of growth (8 questions)

1. **Benefits**: higher real incomes and living standards, more jobs, more tax revenue for public services (this is a benefit, not a cost), more choice, and the means to reduce poverty.
2. **Costs**: demand-pull inflation if growth outruns capacity; a worse current account (higher incomes suck in imports); pollution, climate change and running down resources; inequality; stress, longer hours and congestion.
3. **"Living standards definitely rose"** needs higher real income per head **and** nothing getting worse, for example more income with fewer hours worked.
4. **Longer parts**: use the extract's figures (GDP, unemployment, HDI, income per head), and for a change in labour supply consider AD **and** AS both rising, employment, and remittances sent abroad worsening the current account. Finish with a judgement on overall performance.

6. Identify recessions and trade-cycle phases from data (7 questions)

1. **Recession**: two or more **consecutive quarters** of **negative** real GDP growth. Define it with all three parts: real GDP, falls, two successive quarters.
2. **Count recessions** on a quarterly growth chart: runs of at least two bars below zero. A single negative quarter is not a recession.
3. **On a GDP level chart or forecast**, a recession is a falling stretch of the line; find the longest falling stretch.
4. **On a table of annual growth rates**, positive but falling growth is a **downturn**; negative growth is a recession.
5. **Effects of negative growth**: unemployment rises (most likely), inflation falls, imports fall.

7. Explain causes of growth and productivity from information (7 questions)

1. **Productivity** is output per worker (or per hour). Automation, training, better management and new technology raise it; more workers alone does not.
2. **Name the cause, then develop it**: more investment, FDI, education, R&D, migration, tax cuts or cheap labour → more or better factors of production → higher output and productivity → higher real GDP. Say whether it works through AD (short run), LRAS (long run) or both.
3. **Check claims against the data**: if the extract says innovation is rising but the chart shows productivity flat, say so.

4. **Population change:** fewer young people means a smaller workforce and fewer entrepreneurs (lower AS); more old people means more spending on pensions and care (higher government spending, possibly a bigger deficit). Point-marked: one mark per developed step, plus a conclusion where asked.

8. Measure growth from data (6 questions)

1. **Real growth** $\approx$ nominal growth – inflation. **Growth per head** $\approx$ real growth – population growth. For example, nominal income +7%, inflation 4%, population +2%: real income per head changes by about $7 - 4 - 2 = +1\%$.
2. **Comparing countries:** with nominal growth and inflation for four countries (3.5 and 1.2, –0.8 and 6.0, 5.0 and 7.5, 9.0 and 12.5), real growth is about 2.3, –6.8, –2.5 and –3.5%: only the first had positive real growth, even though the last had the fastest nominal growth. Negative nominal growth with positive inflation is not deflation.
3. **"Definitely" higher growth per head:** real output must rise (output up or prices down with nominal GDP flat) while population does not rise faster.
4. **Why real GDP?** Nominal GDP rises with prices; real GDP removes inflation, so it shows the change in the quantity of goods and services. In an essay, also explain per head, purchasing power parity for comparisons between countries, and why the measure matters (policy, living standards, comparisons), with its limits (informal economy, distribution, quality, environment).

9. Explain automatic stabilisers and the budget over the cycle (5 questions)

1. **Stabilising combination:** a **progressive** income tax with **means-tested** benefits. Regressive taxes and universal benefits do not change much with income.
2. **In a downturn** (more demand-deficient unemployment): tax revenue **falls** and government spending on benefits **rises**, even with rates unchanged, so the budget deficit **widens**. In a boom: the reverse.
3. **Data response:** governments borrow to fund spending that tax does not cover; they should spend more in a recession because it raises AD, output and jobs through the multiplier, reducing the fall in GDP.

10. Pick a policy that promotes inclusive growth (1 question)

1. Inclusive growth shares the gains widely. Minimum wages, infrastructure, education and health spending, and redistribution through taxes and transfers all help.
2. **Least likely** to help: reducing the power of trade unions, cutting benefits, or tax cuts aimed at the rich.

Worked examples

Example 1

Over a year, a country's nominal GDP rises by 5%, its price level by 3% and its population by 4%.

What is the best estimate of what happened?

A Real GDP per head fell by about 2%. **B** Real GDP rose by about 8%. **C** Real GDP per head rose by about 2%. **D** Real GDP fell by about 2%. [1]

Real GDP rose by about $5 - 3 = 2\%$. Population rose faster, by 4%, so real GDP per head changed by about $2 - 4 = -2\%$: **A** (1). (Exactly, $\frac{1.05}{1.03 \times 1.04} - 1 = -1.98\%$.)

C ignores population growth (2% is the rise in total real GDP); B adds inflation instead of subtracting it ($5 + 3$); D confuses the fall per head with total real GDP, which rose.

Example 2

An economy's potential output is \$800bn and its actual output is \$760bn.

Which is most likely?

A a negative output gap of 5% and falling inflation **B** a positive output gap of 5% and rising inflation **C** a negative output gap of 5% and rising inflation **D** a positive output gap of 5% and falling unemployment [1]

Actual is below potential by \$40bn, which is $\frac{40}{800} \times 100 = 5\%$ of potential, so the gap is negative. With spare capacity and cyclical unemployment, demand-pull pressure is weak and inflation tends to fall: **A** (1).

Example 3

Extract: Over ten years a country's real GDP grew by 6% a year. Most of the extra output came from clearing forest for cattle ranching and from new coal mines that supply its power stations. Over the same period, carbon emissions per person doubled and several rivers became too polluted for fishing.

(a) Define sustainable economic growth. [2]

(b) Explain two ways the government could make the country's growth more sustainable. [4]

(a) Growth in output and living standards today (1) that does not reduce the ability of future generations to meet their own needs, for example by using up resources or damaging the environment (1).

(b) A **carbon tax** on coal-fired power (1) raises the price of polluting energy, so firms and households use less and switch to renewable sources, cutting emissions while output continues to grow (1). **Limits on forest clearing**, such as protected areas and a cap on new ranch land (1), conserve a renewable resource, so it is still available to future generations, while subsidies or training help farmers raise output per hectare on land already cleared (1).

Example 4

With the help of a diagram, evaluate whether an economy with a negative output gap should use fiscal policy or supply-side policy to increase its rate of economic growth. [20]

Model answer (paragraph plan):

1. **Definitions:** economic growth (a rise in real GDP over time); actual and potential growth; a negative output gap (actual output below potential); fiscal policy (changes in government spending and taxation); supply-side policy (measures that raise the quantity or quality of factors of production). (AO1)
2. **Diagram:** an AD/AS diagram with a Keynesian LRAS, equilibrium at Y_1 well below Y_F , and the negative output gap marked, as in the AD/AS diagram in "Understand it". Expansionary fiscal policy shifts AD1 to AD2, raising output towards Y_F with only a small rise in the price level. (AO1, AO2)
3. **Fiscal policy chain:** higher government spending (or tax cuts) is an injection; firms sell more and hire more; the extra incomes are spent again, so with a marginal propensity to consume of 0.2, a marginal rate of tax of 0.2 and a marginal propensity to import of 0.1, the multiplier is $k = \frac{1}{0.2+0.2+0.1} = 2$ and an extra \$20bn of spending raises income by \$40bn. Cyclical unemployment falls and actual growth rises. (AO2)
4. **Supply-side chain:** training, infrastructure and incentives for investment raise productivity and capacity, shifting LRAS right and raising potential growth; but with a negative gap, capacity is already unused, so more capacity alone adds little output now. (AO2)
5. **Evaluation of fiscal policy:** the effect depends on the size of the multiplier (a high propensity to import leaks spending abroad); confidence may be so low that households save tax cuts; borrowing raises debt and may raise interest rates and crowd out private investment; time lags may mean the stimulus arrives as the economy recovers; once the gap closes, further stimulus mainly causes inflation. (AO3)
6. **Evaluation of supply-side policy:** slow (years for education or infrastructure to pay off), costly to a budget already in deficit, uncertain in effect; but it raises the trend rate of growth without inflation and is needed for growth to continue once the gap is closed. Spending on infrastructure is both: it raises AD now and capacity later. (AO3)
7. **Conclusion:** with a negative output gap, fiscal policy is the better first step because the problem is too little demand; supply-side policy is the better long-run answer; the best mix is a fiscal stimulus aimed at investment in infrastructure and skills. (AO3)

Table A top level (14): accurate definitions, an accurate labelled AD/AS diagram used in the argument, developed chains for both policies. Table B top level (6): several developed evaluative points and a justified conclusion that answers "should". **20/20**.

Common mistakes

- **Measuring the gap from the wrong curve.** In March 2022 (Paper 32 Q25) only 34% were right: half measured the output gap with the old AD curve when both AD and AS had shifted. Use the new curves.
- **Getting the positive gap backwards.** In June 2022 (Q24 on two variants) only 47% and 25% knew a positive output gap brings inflation: it means resources are over-used, not spare.
- **Thinking potential output means only full employment of labour.** In November 2021 (Paper 33 Q18), 42% chose this; the gap is between actual GDP and its long-run potential level, which depends on every factor of production.
- **Not knowing what a recession is.** In March 2026 (Paper 32 Q19) the wrong answers were spread evenly, because most candidates did not count two consecutive quarters of negative growth. In March 2023 (Paper 42 Q1(a)) many described what happens in a recession (unemployment, low investment) instead of defining it: real GDP, falling, for two successive quarters.

- **Drawing diagrams without explaining them.** In June 2023 (Paper 42 Q1(b)) and November 2021 (Paper 41 Q7(a)) many drew correct PPC or AD/AS diagrams but did not explain the difference between actual and potential growth, or which one a policy affects in the short and long run.
- **Not identifying the gap you drew.** In November 2022 (Paper 41 Q7), some drew correct diagrams but did not show where the positive and negative output gaps were, or never defined a budget deficit. Better answers argued a government would not increase its deficit with a positive gap.
- **One-sided essays.** In June 2024 (Paper 4 Q4) the top answers balanced the benefits of growth with its costs: demand-pull inflation with little spare capacity, more imports, and environmental damage. In the same session, environmental points were often listed but not developed as a negative externality.

How to get the marks

- **Multiple choice:** decide the sign of the gap or the phase of the cycle first, then the effects. For calculations, subtract inflation and population growth from nominal growth. Read "not", "least likely" and "definitely" carefully.
- **Definitions** earn the first marks: actual and potential growth, full employment (output at capacity; the only jobless are frictionally or structurally unemployed), output gap, recession (real GDP, falls, two consecutive quarters), automatic stabiliser, inclusive growth, sustainable growth (future generations).
- **Diagrams:** label the axes (price level, real output; or two goods on a PPC), every curve (AD1, AD2, LRAS1, LRAS2, PPC1, PPC2) and the outputs (Y_1 , Y_F). Mark the output gap. Refer to the diagram in your writing.
- **"Explain" and "analyse"** need developed chains: cause → mechanism → effect on output, prices, jobs or the environment.
- **Data response** is point-marked: define, then use the extract's examples and figures; "comment on" and "discuss" need both sides and, for the last mark, a conclusion.
- **Essays (20 marks since 2023):** Table A (14) rewards accurate definitions, a correct diagram and developed analysis; Table B (6) rewards evaluation and a justified conclusion. Evaluate with spare capacity, inflation, the multiplier, confidence, crowding out, time lags, short run against long run, and side effects on equality and the environment. In 2021–2022, 12-mark parts used four levels: the top level needed analysis with a diagram, at least two points on each side, and a conclusion.
- **Answer the question's own words:** "always", "only", "should", "most effective". Showing that a claim is only partly true is often the judgement that earns the top level.

Quick check

1. Nominal GDP rises from \$500bn to \$540bn while the price index rises from 100 to 105. Find the real growth rate.
2. Potential output is \$2000bn and actual output is \$1940bn. Find the output gap as a percentage and say whether it is positive or negative, with one likely effect.
3. Income tax is 30% of weekly pay above \$300. A worker's pay falls from \$1200 to \$900. By how much does take-home pay fall, and why does this make income tax an automatic stabiliser? [3]

4. Classify each as market-based or regulatory: a carbon tax; a ban on new coal power stations; tradable pollution permits; a fishing quota.
5. Define inclusive economic growth and give one policy that promotes it. **[2]**

Answers

1. Real GDP this year = $540 \times \frac{100}{105} = 514.29\text{bn}$. Real growth = $\frac{514.29-500}{500} \times 100 = 2.86\%$ (about $8 - 5 = 3\%$ by the shortcut).
2. Gap = $1940 - 2000 = -60\text{bn}$, which is $\frac{-60}{2000} \times 100 = -3\%$: a **negative** output gap. Likely effect: cyclical unemployment, or falling inflation.
3. Taxable pay falls from \$900 to \$600, so tax falls from $0.3 \times 900 = 270$ to $0.3 \times 600 = 180$, and take-home pay falls from \$930 to \$720, by \$210, less than the \$300 fall in pay (1). Because tax takes a smaller share as pay falls, disposable income and spending fall by less (1), which cushions AD in a downturn without any new government decision (1).
4. Market-based: the carbon tax and tradable permits. Regulatory: the ban and the fishing quota.
5. Growth whose benefits, in income and opportunity, are shared fairly across all groups in society (1). One policy: free education or health care, progressive taxes with transfers, a minimum wage, or infrastructure in poor regions (1).

Past questions to try

- **9708/32/F/M/24 Q19**: real income per head from nominal income, inflation and population.
- **9708/33/M/J/23 Q18**: which policy gives sustainable growth in a fishing industry.
- **9708/43/O/N/23 Q4**: a 20-mark essay on fiscal policy to close a negative output gap.
- **9708/42/O/N/24 Q1**: a PPC diagram for changes in labour supply, then macroeconomic performance.