

Cambridge AS & A Level · Economics 9708 · Notes

The circular flow of income A2

Read online at pastopic.com/cambridge/economics-9708/notes/circular-flow-of-income

Last checked 5 October 2026

Read first: [Introduction to the circular flow of income](#), [National income statistics](#)

© 2026 Pastopic. Free for personal study. Please share the link, not the file.

What you need to know

This topic has three groups of learning outcomes.

The multiplier process

1. **Define the multiplier:** how many times bigger the final change in national income is than the change in injections (or autonomous spending) that started it.
2. **Use the multiplier formulae** for a closed economy without a government, a closed economy with a government, and an open economy with a government, and calculate the multiplier from given propensities.
3. **Calculate the propensities:** average and marginal propensities to consume (APC, MPC), to save (APS, MPS) and to import (APM, MPM), and average and marginal rates of tax (ART, MRT).
4. **Find equilibrium national income** with the aggregate demand (expenditure) approach, where planned spending equals income, and with the income approach, where withdrawals equal injections, and show how the multiplier moves it.
5. **Calculate how much national income changes** when aggregate demand (AD) changes, using the multiplier.

The components of AD and what determines them

6. **The consumption function:** autonomous and induced consumer spending.
7. **The savings function:** autonomous and induced saving.
8. **Investment:** autonomous and induced investment, and the **accelerator**.
9. **Government spending.**
10. **Net exports:** exports minus imports.

Equilibrium and full employment

11. **Full employment national income and equilibrium national income** can differ: explain **inflationary and deflationary gaps**.

Understand it

Where this fits

In the AS introduction you met the circular flow: households earn income from firms and spend it back, while **withdrawals** (saving S , taxes T , imports M) leak out and **injections** (investment I , government spending G , exports X) come in. National income is in equilibrium when $J = W$. This topic puts numbers on that idea: how much of each extra dollar leaks out, and how far national income moves when spending changes.

Aggregate demand

Aggregate demand (also called aggregate expenditure or aggregate monetary demand, AMD) is total planned spending on an economy's output:

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

How many components there are depends on the economy:

Economy	Sectors	AD
Closed, no government	households, firms	$C + I$
Closed, with government	+ government	$C + I + G$
Open, with government	+ rest of the world	$C + I + G + (X - M)$

So $AD = C + I + (X - M)$ describes an **open economy without a government**, and a free-market economy has no taxes at all, so no indirect taxation.

Autonomous and induced spending

- **Autonomous** spending does not depend on the current level of national income. Households still buy food when income is zero, by borrowing or using savings; government sets G by political decision; exports depend on **foreign** incomes.
- **Induced** spending changes **because** national income changes: households with more income consume more and save more, and import more.

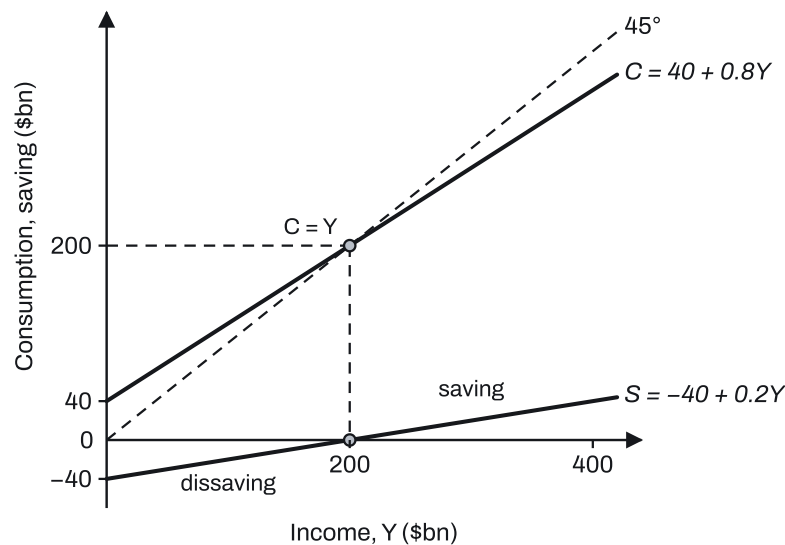
On a diagram, autonomous spending is the **intercept** (a horizontal line, the same at every income) and induced spending is the part that rises with income. At low incomes autonomous spending is most of the total; as income rises, induced spending grows and becomes the bigger part.

The consumption and savings functions

A simple consumption function is

$$C = a + bY$$

where a is **autonomous consumption** and b is the **marginal propensity to consume**, the share of each extra dollar of income that is spent. Anything households do not consume they save, so the **savings function** is its mirror image: $S = -a + (1 - b)Y$.



With $C = 40 + 0.8Y$ (\$ billion):

Income Y	Consumption C	Saving S	$APC = C/Y$	$APS = S/Y$
100	120	-20	1.2	-0.2
200	200	0	1.0	0
400	360	40	0.9	0.1

- **MPC stays 0.8** at every income: the slope of a straight line is constant.
- **APC falls** as income rises (1.2, 1.0, 0.9...) towards the MPC, and is **always above the MPC** when autonomous consumption is positive, because the fixed \$40 is shared over a bigger income. So the APS rises with income.
- $APC + APS = 1$ and $MPC + MPS = 1$, as long as income is only consumed or saved.
- Below \$200 billion, households **dissave** (spend more than their income).

A movement or a shift? A change in **income** moves along the consumption function (induced). Anything else **shifts** it, changing autonomous consumption: wealth (house and share prices), interest rates and the availability of credit, expectations and confidence, the distribution of income (the poor have a higher MPC), and taxes. If households keep up their living standards when real incomes fall, they are raising **autonomous consumption**. If the line becomes **flatter**, the MPC has fallen; if it starts higher up the axis, autonomous consumption has risen.

Saving depends on the same things the other way round: higher interest rates reward saving, worries about the future raise precautionary saving, and pension schemes and an ageing population change how much people put aside. Keynes's point was that saving depends mainly on **income**, and investment on **expected**

profit, so they are made by different people for different reasons, and nothing makes them equal automatically. Income adjusts until they are.

Propensities and rates in an open economy with a government

Each average is "total ÷ income"; each marginal is "change ÷ change in income". Suppose national income rises from \$1000 billion to \$1200 billion:

	At $Y =$ 1000	At $Y =$ 1200	Average at 1000	Marginal
Consumption of domestic output C	700	850	APC = 0.70	MPC = $150/200 = 0.75$
Saving S	100	120	APS = 0.10	MPS = $20/200 = 0.1$
Tax T	150	170	ART = 0.15	MRT = $20/200 = 0.1$
Imports M	50	60	APM = 0.05	MPM = $10/200 = 0.05$

Each extra dollar is either spent on domestic output or withdrawn, so here $MPC + MPS + MRT + MPM = 1$. The share withdrawn is the **marginal propensity to withdraw**, $MPW = MPS + MRT + MPM = 0.25$.

The multiplier

Suppose firms spend an extra \$80 million on new factories (an injection). That \$80 million becomes the income of builders and suppliers. With $MPW = 0.25$, they withdraw \$20 million and spend \$60 million on domestic output; that becomes someone else's income, who spends \$45 million, then \$33.75 million, and so on:

$$\Delta Y = 80 + 60 + 45 + 33.75 + \dots = \frac{80}{1 - 0.75} = 320$$

Each round is smaller because part leaks out. The total stops growing when the extra withdrawals equal the extra injection: $0.25 \times 320 = 80$. The **multiplier** is

$$k = \frac{\Delta Y}{\Delta J} = \frac{1}{MPW} = \frac{1}{1 - MPC} = \frac{1}{0.25} = 4$$

where MPC is the share of extra income spent on **domestic** output.

Economy	Multiplier
Closed, no government	$k = \frac{1}{MPS} = \frac{1}{1 - MPC}$
Closed, with government	$k = \frac{1}{MPS + MRT}$
Open, with government	$k = \frac{1}{MPS + MRT + MPM}$

What this means:

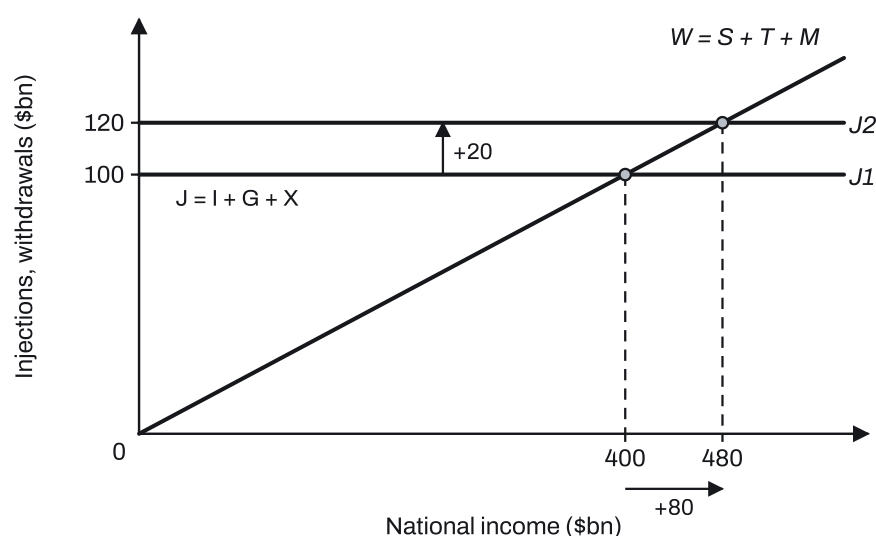
- **The bigger the leakages, the smaller the multiplier.** Opening a closed economy to trade adds imports as a withdrawal, so the multiplier **falls**. A high MPC (or a low MPS, MRT or MPM) gives a large multiplier.
- **It works in both directions:** a fall in investment of \$80 million cuts income by \$320 million.
- **It acts on any change in autonomous spending** (I , G , X , or autonomous C). Several changes at once: add them up first, then multiply.
- **Induced withdrawals follow from the change in income:** with $MRT = 0.1$, a \$320 million rise in income raises tax revenue by $0.1 \times 320 = 32$ million. Find ΔY first, then take the share.
- **Assumptions:** the Keynesian multiplier assumes **spare capacity** (unemployed resources), so extra demand raises real output, not just prices, and constant propensities. Near full employment the extra spending mostly raises prices. With a consumption function like $C = a + bY$, the APS rises as income grows.
- **Limits in practice:** time lags between the rounds, leakages that change (confidence can raise saving), and prices that rise as capacity runs out.

Determining national income: two approaches

Take an economy where injections ($I + G + X$) are \$100 billion and the MPW is 0.25 (MPS 0.1, MRT 0.1, MPM 0.05).

Expenditure (AD) approach. Planned spending on domestic output is $AE = 100 + 0.75Y$. Equilibrium is where planned spending equals income, on the 45° line: $Y = 100 + 0.75Y$, so $Y = 400$. Below 400, spending exceeds output, stocks run down and firms raise output; above 400, unsold stocks pile up and firms cut output.

Income (withdrawals and injections) approach. Withdrawals are $W = 0.25Y$. Equilibrium is where $W = J$: $0.25Y = 100$, so $Y = 400$, the same answer.



Now raise injections by \$20 billion, to 120. The multiplier is $1/0.25 = 4$, so income rises by $4 \times 20 = 80$, to 480. Check: $0.25 \times 480 = 120$, so $W = J$ again. In the expenditure approach, the AE line shifts up by 20 and meets the 45° line at 480.

For an equation question, write AD out and solve: with $C = 30 + 0.6Y$, $I = 70$, $X = 90$ and $M = 60$, $Y = 30 + 0.6Y + 70 + 90 + 60$, so $0.4Y = 130$ and $Y = 325$.

What moves equilibrium income? A rise in any injection or a fall in any withdrawal raises it: lower interest rates (less saving, more borrowing for consumption and investment), lower taxes, a lower propensity to import, more government spending or exports. A rise in saving, taxes or imports, or a cut in G (for example, defence spending), lowers it. Moving money from one bank account to another changes nothing.

Investment and the accelerator

Investment is spending on new capital goods (machines, buildings, roads) that will produce output in future.

- **Autonomous investment** does not depend on the level of income. Firms invest if the **expected return** on a project beats the **cost of borrowing**. The expected return is the **marginal efficiency of capital (MEC)**: higher with business confidence, new technology and expected demand; lower when capital goods cost more. So investment falls when **interest rates rise** or confidence falls, and rises with company profits (which fund it), tax allowances and lower interest rates.
- **Induced investment** happens **because demand for output is growing**: firms need more capacity to meet it. This is the **accelerator**.

The **accelerator principle**: net investment depends on the **rate of change** of national income (or output), not its level. Suppose firms need \$3 of capital for each \$1 of yearly output (a capital-output ratio of 3), and replace \$20 billion of worn-out machines each year:

Year	Output	Capital needed	Net investment	Gross investment
1	100	300	–	–
2	110	330	30	50
3	125	375	45	65
4	135	405	30	50
5	140	420	15	35
6	140	420	0	20

Output grows every year until year 6, yet net investment **falls** from year 4, because output grows by **less** than the year before (15, then 10, then 5). Small changes in the growth of demand cause big swings in investment, which helps explain why investment is the most volatile part of AD.

The accelerator works best when firms have **no spare capacity** and expect the rise in demand to be **permanent**. With idle machines, or a rise seen as temporary, firms meet demand without investing.

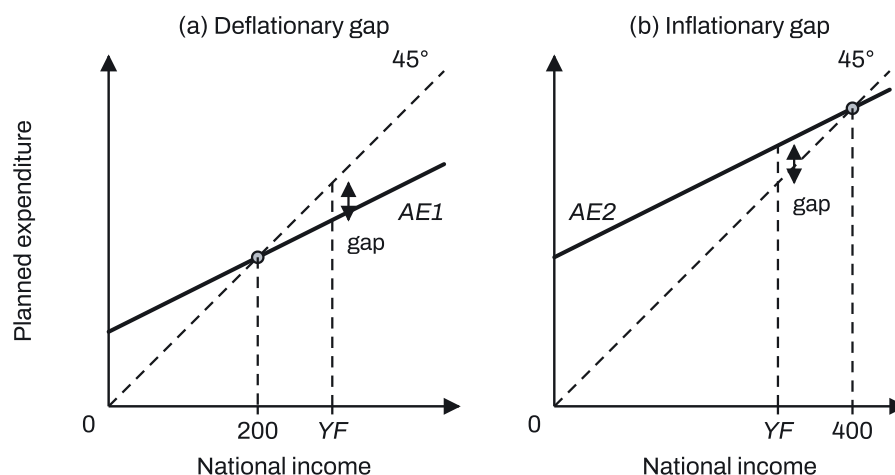
Multiplier and accelerator together. The multiplier runs from an **autonomous** injection to income; the accelerator runs from a change in income to **induced** investment. A rise in investment raises income (multiplier); faster growth of income raises investment (accelerator); and when growth slows, investment falls and the multiplier pulls income down. Together they help to explain booms and recessions.

Government spending and net exports

- **Government spending** (on health, education, defence, infrastructure, public-sector pay) is autonomous: governments decide it by policy, often against the cycle. Transfer payments such as benefits and pensions are not part of G , because nothing is produced in return, but they raise households' disposable income and so consumption.
- **Exports** depend on foreign incomes, the exchange rate, relative inflation and quality; they are autonomous. Spending by foreign tourists in your country counts as an export.
- **Imports** are induced by domestic income (the MPM) and also depend on the exchange rate and relative prices. Your residents' spending abroad on holidays is an import, a withdrawal.
- **Net exports** ($X - M$) add to AD when positive. A government that cannot borrow more, or where low confidence stops investment responding to low interest rates, may try **export-led growth**: a depreciation, trade deals or support for exporting firms raise X , and the multiplier spreads the extra income.

Full employment income, equilibrium income and the gaps

Equilibrium national income is where $AE = Y$. Nothing makes it equal to the **full employment** level of national income, Y_F , the output when the economy uses all its resources. Keynes argued an economy can stay in equilibrium with high unemployment.



- **Deflationary gap**: AD at the full employment income is **less** than full employment output, so equilibrium income is below Y_F and there is **demand-deficient (cyclical) unemployment**. The gap is the **vertical** distance between the 45° line and the AE line **at** Y_F . In panel (a), $AE = 100 + 0.5 \times 300 = 250$, so the gap is $300 - 250 = 50$.
- **Inflationary gap**: AD at full employment **exceeds** full employment output. Real output cannot rise beyond Y_F , so the excess demand pulls prices up (**demand-pull inflation**). In panel (b), $AE = 200 + 0.5 \times 300 = 350$, so the gap is $350 - 300 = 50$.

To close a gap, AD must change by the gap, not by the difference in incomes. The diagrams show an economy whose MPW is 0.5, so $k = 2$. In panel (a), equilibrium income must rise by $300 - 200 = 100$, but an extra \$50 billion of injections is enough: $\Delta J = \Delta Y \div k = 100 \div 2 = 50$. Fiscal policy (more G , lower taxes), monetary

policy (lower interest rates) or export-led growth can close a deflationary gap; the reverse closes an inflationary one.

Key facts and formulas

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

Formula	Status
Aggregate demand: $AD = C + I + G + (X - M)$	Learn it
Consumption function $C = a + bY$: a is autonomous consumption, b is the MPC	Learn it
$APC = \frac{C}{Y}$, $APS = \frac{S}{Y}$, $APM = \frac{M}{Y}$, $ART = \frac{T}{Y}$	Learn it
$MPC = \frac{\Delta C}{\Delta Y}$, $MPS = \frac{\Delta S}{\Delta Y}$, $MPM = \frac{\Delta M}{\Delta Y}$, $MRT = \frac{\Delta T}{\Delta Y}$	Learn it
Income only consumed or saved: $APC + APS = 1$ and $MPC + MPS = 1$	Learn it
Multiplier, closed economy without government: $k = \frac{1}{1 - MPC} = \frac{1}{MPS}$	Learn it
Multiplier, closed economy with government: $k = \frac{1}{MPS + MRT}$	Learn it
Multiplier, open economy with government: $k = \frac{1}{MPS + MRT + MPM}$	Learn it
Change in national income: $\Delta Y = k \times \Delta J$ (or $\times$ the change in any autonomous spending)	Learn it
Equilibrium national income: $Y = C + I + G + (X - M)$, or withdrawals = injections, $S + T + M = I + G + X$	Learn it
Deflationary or inflationary gap = full employment income – AD at full employment income (positive: deflationary; negative: inflationary)	Learn it
Change in injections needed to reach full employment = $\frac{\text{full employment income} - \text{equilibrium income}}{k}$	Learn it
Accelerator: net investment = capital-output ratio $\times$ change in output	Learn it

How to do it

We tagged 75 questions for this topic, from March 2021 to March 2026 (64 different; 11 are repeats across paper variants): 65 Paper 3 multiple choice and 10 Paper 4 essays and data-response questions. Each question is counted under one type.

Question type	Questions
Identify injections and withdrawals, and what changes equilibrium national income	16
Explain the accelerator and the determinants of investment	12
Explain what the multiplier is and what makes it larger	11
Identify or calculate an inflationary or deflationary gap	10
Calculate the multiplier and the change in national income	8
Use the consumption function: propensities, autonomous and induced spending	8
Essay: analyse a change with a circular flow or injections and withdrawals diagram	6
Essay: consumption, saving and investment	2
Data response: the multiplier and AD in context	2

1. Identify injections and withdrawals, and what changes equilibrium national income (16 questions)

All multiple choice.

- Sort each item: **injections** are I, G, X ; **withdrawals** are S, T, M . Ask "is this money entering the domestic flow from outside it, or leaving it?"
- Watch the direction of trade: foreign tourists spending **here** is an export (injection); **our** residents spending abroad is an import (withdrawal).
- A rise in an injection or a fall in a withdrawal raises national income; the opposite lowers it. Something that only moves money between accounts, or is a **transfer** within the flow, changes neither.

Variants:

- **Net injections** from a sector: $I > S, G > T$ or $X > M$ (spending more than it withdraws).
- **Which AD equation fits which economy:** $C + I + (X - M)$ has no G , so it is open and without a government; a free-market economy has no taxes.
- **Offsetting a leakage:** a rise in an injection (say investment) offsets a leakage; cuts in consumption or G , or higher interest rates, make it worse.
- **"Will definitely raise income":** both changes must push the same way, such as more G with a lower propensity to import. Pairs that pull opposite ways (a tax cut with more saving) are uncertain.
- **Solve for equilibrium** from equations: write $Y = C + I + G + (X - M)$ with the numbers and solve.

- **An AD/AS diagram with both curves shifting:** read the new equilibrium where the **new** AD meets the **new** AS.

2. Explain the accelerator and the determinants of investment (12 questions)

All multiple choice.

1. **The accelerator:** investment depends on the **rate of change** of national income (or of demand). Reject options that say level of GDP, interest rates, savings or confidence.
2. **When investment falls under the accelerator:** income still rises, but **by less** than before (growth slows). A smaller **fall** in income would not do it.
3. **Accelerator investment is induced;** the investment that starts the **multiplier** is **autonomous**.
4. Investment is most likely to respond when firms have **no spare capacity** and see the rise in income as **permanent**.
5. **Other determinants:** a rise in interest rates or the price of capital goods cuts investment; higher profits, confidence, national income growth and a higher **marginal efficiency of capital** raise it. "Demand-induced investment" is spending on capital goods because demand for final output is growing faster.

3. Explain what the multiplier is and what makes it larger (11 questions)

All multiple choice.

1. **Definition:** a change in injections (investment, G , X) causes a **larger** change in equilibrium national income. In a closed economy with no government it shows the effect of investment on national income.
2. **Formula for a closed economy without government:** $AD = C + I$ and $k = 1/\text{MPS}$.
3. **Bigger multiplier:** higher MPC; lower MPS, MRT or MPM. Opening up to trade adds a leakage, so the multiplier falls. A high **average** tax rate or high autonomous consumption does not change the multiplier; the **marginal** propensities matter.
4. **Comparing changes in propensities:** work out the new MPW for each option. A change that raises the MPC and cuts a withdrawal is the one that raises k ; a rise in one withdrawal offset by an equal fall in another leaves k unchanged.
5. **Assumptions:** spare capacity, prices that do not rise, constant propensities; with $C = a + bY$ the APS rises with income. It is not about full employment or flexible prices.

4. Identify or calculate an inflationary or deflationary gap (10 questions)

All multiple choice, often from a 45° line diagram.

1. Find the **full employment income** Y_F on the horizontal axis.
2. Read the AE line and the 45° line **at** Y_F , not at equilibrium. The vertical distance between them is the gap.
3. AE **below** the 45° line at Y_F : **deflationary** gap; AE **above**: **inflationary** gap.

4. **Calculations:** work out AE at Y_F from the equations, **including autonomous consumption**, and subtract Y_F . Or: change in injections needed = $(Y_F - Y_e) \div k$. For example, MPC 0.75 means $k = 4$; to raise income from \$6000 million to \$8000 million, injections must rise by $2000 \div 4 = 500$ million.
5. In words: an inflationary gap is AD greater than the economy's maximum (full employment) output; it is not "operating below capacity".

5. Calculate the multiplier and the change in national income (8 questions)

All multiple choice.

1. **Pick the formula** for the economy described, and add up the withdrawal propensities: $MPW = MPS + MRT + MPM$. If only the MPC is given (closed, no government), $MPW = 1 - MPC$.
2. $k = 1/MPW$.
3. **Net injection first:** add every change (autonomous C, I, G, X), with signs. A \$3000 rise in X with an \$800 fall in G is a net \$2200.
4. $\Delta Y = k \times \text{net injection}$.
5. **Induced changes:** extra tax = $MRT \times \Delta Y$, extra imports = $MPM \times \Delta Y$, extra saving = $MPS \times \Delta Y$.

Working backwards: if, in a closed economy with no government, a \$15 billion rise in investment raises income from \$300 billion to \$360 billion, then $k = 60/15 = 4$, so $MPS = 0.25$ and $MPC = 0.75$.

6. Use the consumption function: propensities, autonomous and induced spending (8 questions)

All multiple choice.

1. In $C = a + bY$, b is the MPC and a is autonomous consumption.
2. **APC from data:** C/Y at each income; **MPC:** $\Delta C/\Delta Y$ between incomes. With a straight-line consumption function and $a > 0$, the MPC is **constant** and the APC **falls**, always staying **above** the MPC.
3. **A shifted consumption line:** a higher intercept means more autonomous consumption; a flatter line means a lower MPC.
4. **Autonomous or induced?** Spending that changes with income is induced; spending kept up whatever happens to income (for example, to protect living standards) is autonomous.
5. **On an AMD diagram**, autonomous spending is the same at every income, so it is largest compared with induced spending at the **lowest** income.

7. Essay: analyse a change with a circular flow or injections and withdrawals diagram (6 questions)

Paper 4. In 2021–2022 these were 12-mark parts and whole 25-mark questions marked in levels; since 2023 they are 20-mark essays (Table A, knowledge and analysis, 14 marks; Table B, evaluation, 6 marks).

Questions ask about a fall in interest rates, export-led growth (in a developed economy in recession, or for living standards in a developing one), or why an economy can be in equilibrium below full employment.

Plan:

1. **Define** the key terms: circular flow, injections and withdrawals, equilibrium national income, full employment, plus the question's own words (recession: GDP falling for two quarters in a row; export-led growth).
2. **Draw an injections and withdrawals diagram** (J horizontal, W rising from the origin, both against national income) with the initial equilibrium and the full employment income Y_F marked; then shift the curve the change affects. An **injections and withdrawals graph is better than a box diagram** of households and firms: examiners give more credit to it, and a "with the help of an injections and withdrawals graph" question without one is capped at Level 2.
3. **Explain the transmission** in a developed chain. For a fall in interest rates:
 - saving is less rewarding and borrowing is cheaper, so households save less and consume more (withdrawals fall, W shifts down or pivots);
 - investment rises if expected returns now beat the cost of borrowing (J shifts up);
 - the currency may depreciate, raising exports (J up) and making imports dearer;
 - the extra spending raises firms' sales, so they produce more and hire more workers: output, income **and employment** rise;
 - **the multiplier** spreads the effect: the rise in income is a multiple of the first change, larger the lower the MPW; the **accelerator** may add induced investment.
4. **Evaluate** (AO3), one developed point at a time:
 - near **full employment**, extra demand raises prices more than output (an inflationary gap); with lots of spare capacity, output and jobs rise a lot;
 - a depreciation makes imports dearer: **cost-push inflation**;
 - cheap borrowing can feed house-price inflation and debt;
 - **investment may not respond** if confidence is low (low interest elasticity of investment);
 - the type of unemployment matters: more demand cures **cyclical** unemployment, not **structural** or frictional;
 - the **size of the multiplier** (high MPS or MPM means a small effect) and **time lags**;
 - for export-led growth: it depends on demand in trading partners, the exchange rate regime, and whether exporters have spare capacity. Compare it with other ways out of recession: lower interest rates may fail when confidence is low; more government spending may be limited by high national debt.
5. **Conclude** on the question's words ("likely to be successful", "assess the impact"): say how far, and on what it depends.

Set the answer in the **context** given ("a developed economy in recession", "a developing economy"); examiners mark down answers that are generic.

8. Essay: consumption, saving and investment (2 questions)

Paper 4, 2021 (12- and 13-mark parts).

1. **MPC and government policy:** define MPC; explain that Keynesian theory assumes it is constant but it tends to fall as income rises; link it to the multiplier (a high MPC gives a large multiplier, so fiscal changes have a bigger effect); apply it to at least two policy aims (growth, employment, inflation, redistribution: transfers to the poor, who have a high MPC, raise spending most).
2. **What determines saving:** income (the main factor), interest rates, confidence and expectations, wealth, pension and social security provision, inflation, culture. Then assess a rise in saving: in the short run it is a withdrawal, cutting AD, output and employment (the **paradox of thrift**: if everyone saves more, income falls and total saving may not rise); in the long run it can fund investment and raise potential growth, if banks lend it to firms.
3. **"Savings and investment are made by different people for different reasons":** households save from income; firms invest on expected profit (MEC) and the accelerator. So the interest rate alone need not make $S = I$; national income adjusts until withdrawals equal injections, possibly below full employment.

9. Data response: the multiplier and AD in context (2 questions)

Paper 4 Question 1, point-marked parts of about 4 marks.

1. **"Explain how ... through the multiplier effect":** define the multiplier: the total rise in national income from an injection (1); it comes from an injection into the circular flow (1); apply it: the new jobs and incomes in the extract (1) are spent, creating further rounds of spending, jobs and income in other sectors (1).
2. **An increase in government spending or income support with an AD/AS diagram:** labelled axes (price level, real output) and curves (1); AD shifting right with new coordinates (1); G is a component of AD, so AD shifts right (1); real output rises, and the price level rises by more the closer the economy is to full capacity (1).

Worked examples

Example 1

In an open economy with a government sector, the marginal propensity to save is 0.15, the marginal rate of tax is 0.2 and the marginal propensity to import is 0.15. These do not change with income. The government raises its spending by \$30 billion and, at the same time, exports fall by \$10 billion.

By how much will tax revenue rise?

A \$4 billion **B** \$6 billion **C** \$8 billion **D** \$12 billion [1]

$MPW = 0.15 + 0.2 + 0.15 = 0.5$, so $k = 1/0.5 = 2$. The net injection is $30 - 10 = 20$, so national income rises by $2 \times 20 = 40$ billion. Tax revenue rises by $0.2 \times 40 = 8$ billion: **C** (1).

A forgets the multiplier (0.2×20); D forgets the fall in exports ($0.2 \times 2 \times 30$); B is the rise in imports, 0.15×40 .

Example 2

In a closed economy with no government, consumption is $C = 30 + 0.8Y$ and investment is \$50 billion. Full employment national income is \$450 billion.

What is the size of the deflationary gap?

A \$10 billion **B** \$40 billion **C** \$50 billion **D** \$440 billion **[1]**

Equilibrium: $Y = 30 + 0.8Y + 50$, so $0.2Y = 80$ and $Y = 400$. At full employment income, $AE = 30 + 0.8 \times 450 + 50 = 440$, which is \$10 billion short of 450. The gap is \$10 billion: **A** (1). Check: $k = 1/0.2 = 5$, and $5 \times 10 = 50$, the shortfall in income.

C is the difference in incomes (the output gap), not the gap in spending; D is AE at full employment.

Example 3

Extract: Builders' merchants in a country need about \$2 of equipment and buildings for each \$1 of yearly sales. Sales were \$500 million in 2023, \$540 million in 2024 and \$570 million in 2025, and are forecast at \$585 million in 2026.

(a) Using the accelerator, calculate the net investment of the builders' merchants in 2024, 2025 and 2026. **[2]**

(b) Explain why their investment is expected to fall even though sales keep rising, and how this could affect national income. **[4]**

(a) Capital needed: 1000, 1080, 1140 and 1170 (\$ million) (1). Net investment = $2 \times$ the rise in sales: \$80 million in 2024, \$60 million in 2025 and \$30 million in 2026 (1).

(b) Under the accelerator, net investment depends on the **change** in sales, not their level (1). Sales grow by 40, then 30, then 15: growth is slowing, so firms need less new capacity each year and investment falls (1). Investment is an injection, so the fall cuts AD and national income (1) by a **multiple** of the fall, through the multiplier, as lower incomes for equipment makers and builders lead to further rounds of lower spending (1).

Example 4

With the help of an injections and withdrawals diagram, assess whether an increase in government spending on infrastructure will reduce unemployment in an economy. **[20]**

Model answer (paragraph plan):

- Definitions:** injections (I, G, X) and withdrawals (S, T, M); equilibrium national income where $J = W$; unemployment, and the full employment level of income. (AO1)
- The diagram:** J_1 horizontal, W rising with income, equilibrium Y_1 below Y_F (a deflationary gap, demand-deficient unemployment). Higher G shifts injections up to J_2 , and the new equilibrium Y_2 is closer to Y_F , as in the injections and withdrawals diagram in "Understand it". (AO1, AO2)

3. **Transmission:** G is spent on construction firms, which hire workers and buy materials; their incomes are spent in further rounds, so income rises by $k \times \Delta G$, where $k = 1/(\text{MPS} + \text{MRT} + \text{MPM})$. Firms need more workers to produce the extra output, so employment rises and **cyclical** unemployment falls. (AO2)
4. **Long-run gain:** better roads and ports raise productivity and potential output, adding to growth and jobs later. (AO2)
5. **How big the effect is:** a high MPS or MPM, or high taxes, mean a small multiplier and leakages abroad, so fewer domestic jobs; an accelerator effect could add investment if firms see demand growing. (AO3)
6. **Spare capacity:** near full employment, the extra spending opens an inflationary gap: prices rise and few jobs are added. (AO3)
7. **Type of unemployment:** more demand does little for **structural** unemployment (workers with the wrong skills or in the wrong place) or frictional unemployment. (AO3)
8. **Funding and timing:** borrowing raises national debt and may raise interest rates, crowding out private investment; infrastructure takes years to plan, so time lags may mean the jobs arrive after the recession ends. (AO3)
9. **Conclusion:** it is likely to cut unemployment when there is a deflationary gap, unemployment is cyclical and the multiplier is large; it is less effective near full employment, with structural unemployment, or in a very open economy. (AO3)

Table A Level 3 (14): accurate definitions, an accurate labelled injections and withdrawals diagram used in the argument, developed chains through the multiplier to employment. Table B Level 2 (6): several developed evaluative points and a justified conclusion saying when the policy works. **20/20**. No injections and withdrawals diagram would cap the answer at Level 2 (8).

Common mistakes

- **Forgetting to multiply.** In November 2021 (Paper 32 Q25) only 29% found the rise in income from a \$100 million injection with an MPC of 0.6; 40% chose \$60 million, the first round of spending, not 2.5×100 .
- **Taking a share of the injection, not of the rise in income.** In November 2022 (Paper 31 Q26) only 22% were right; half worked out the rise in imports from the \$1000 million of spending, not from the \$1250 million rise in income.
- **Ignoring autonomous consumption in a gap question.** In March 2025 (Paper 32 Q19) most candidates left the \$100 million out of $C = 100 + 0.8Y$, and so worked out the wrong spending at full employment; measure AE at the full employment income, with every term.
- **Thinking the APC is constant or rising.** In March 2026 (Paper 32 Q15) the most common wrong answer said the APC rises with income; with an MPC below 1 and positive autonomous consumption it falls.
- **Mixing up autonomous and induced.** In the same paper (Q16), most did not know that accelerator investment is induced and the multiplier starts from autonomous investment.
- **Not knowing what the multiplier is.** In March 2022 (Paper 32 Q27) only 40% chose "the effect of investment on national income".

- **A diagram of goods and factors, not money.** In June 2024 (AS Paper 22 Q4, on the same diagram) some showed only flows of factors of production and goods instead of income and expenditure, or explained growth with AD/AS when the question asked about the circular flow.
- **Ignoring the context.** In November 2022 (Paper 43 Q5(a)) and June 2022 (Q5), weaker answers did not focus on "a developed economy in recession" or "a developing economy", and did not compare export-led growth with other policies.
- **Treating the MPC as fixed in an essay.** In November 2021 (Paper 41 Q4(a)) stronger answers noted it tends to fall as income rises, and the top level needed the multiplier effect of the MPC.

How to get the marks

- **Multiple choice:** write down the economy type first (closed or open, with or without government), then the formula. For diagrams, find Y_F and read the gap **at** Y_F . Use k before taking any induced share.
- **Definitions** earn the first marks: the multiplier (the change in income is a **multiple** of the change in injections), the accelerator (investment depends on the **rate of change** of income), autonomous and induced.
- **Diagrams:** label the axes (national income; injections and withdrawals, or planned expenditure), the lines ($J = I + G + X$, $W = S + T + M$, or $C + I + G + (X - M)$) and the 45° line), the equilibrium incomes before and after, and Y_F . Refer to the diagram in your writing.
- **"Explain"** needs a developed chain: the change $\rightarrow$ which injection or withdrawal moves $\rightarrow$ spending and output $\rightarrow$ income and employment $\rightarrow$ the multiplier.
- **Essays** from 2023: Table A (14) rewards accurate knowledge and developed analysis with a correct diagram; Table B (6) rewards evaluation and a conclusion that answers the question. In 2021–2022, 12-mark parts used four levels: Level 4 needed sound analysis with an accurate diagram, evaluation and a conclusion.
- **Evaluate** with the size of the multiplier (MPS, MRT, MPM), spare capacity and inflation, the type of unemployment, confidence and interest elasticity of investment, time lags, and the exchange rate. Conclude on the key word ("assess", "likely", "to what extent").
- **Data response** is point-marked: define, then apply to the extract's figures and words.

Quick check

1. When a household's income rises from \$800 to \$1000 a week, its consumption rises from \$680 to \$830. Find the APC at each income, the MPC and the MPS.
2. In an open economy the MPS is 0.1, the MRT is 0.25 and the MPM is 0.15. Investment rises by \$12 billion. Find the multiplier, the rise in national income and the rise in imports.
3. In a closed economy with no government, $C = 20 + 0.9Y$ and $I = 30$ (\$ billion). Find equilibrium national income. If full employment income is \$560 billion, what is the gap, and what kind is it?
4. Explain why, according to the accelerator, investment can fall while national income is still rising. **[2]**
5. Distinguish between autonomous and induced consumption. **[2]**

Answers

1. $APC = 680/800 = 0.85$ at \$800 and $830/1000 = 0.83$ at \$1000. $MPC = 150/200 = 0.75$, so $MPS = 0.25$.
2. $MPW = 0.1 + 0.25 + 0.15 = 0.5$, so $k = 2$. Income rises by $2 \times 12 = 24$ billion, and imports by $0.15 \times 24 = 3.6$ billion.
3. $Y = 20 + 0.9Y + 30$, so $0.1Y = 50$ and $Y = 500$. At \$560 billion, $AE = 50 + 0.9 \times 560 = 554$, which is \$6 billion short of 560: a **deflationary gap** of \$6 billion. (Check: $k = 10$, and $10 \times 6 = 60 = 560 - 500$.)
4. Net investment depends on the change in income, not its level (1). If income rises by less than the year before, firms need less extra capacity than before, so investment falls (1).
5. Autonomous consumption does not depend on current income: it is spent even at zero income, financed by borrowing or savings (1). Induced consumption rises and falls with income, by the MPC times the change in income (1).

Past questions to try

- 9708/32/O/N/23 Q17: the multiplier from four marginal propensities.
- 9708/32/M/J/21 Q24: the change in national income when government spending rises and investment falls.
- 9708/33/O/N/21 Q26: the change in AD needed to close a deflationary gap.
- 9708/42/F/M/22 Q7: a 12-mark essay part on a fall in interest rates, with a circular flow diagram.