

Cambridge AS & A Level · Economics 9708 · Notes

Introduction to the circular flow of income

AS

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Read first: [Factors of production](#), [National income statistics](#)

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What you need to know

By the end of this topic you should be able to:

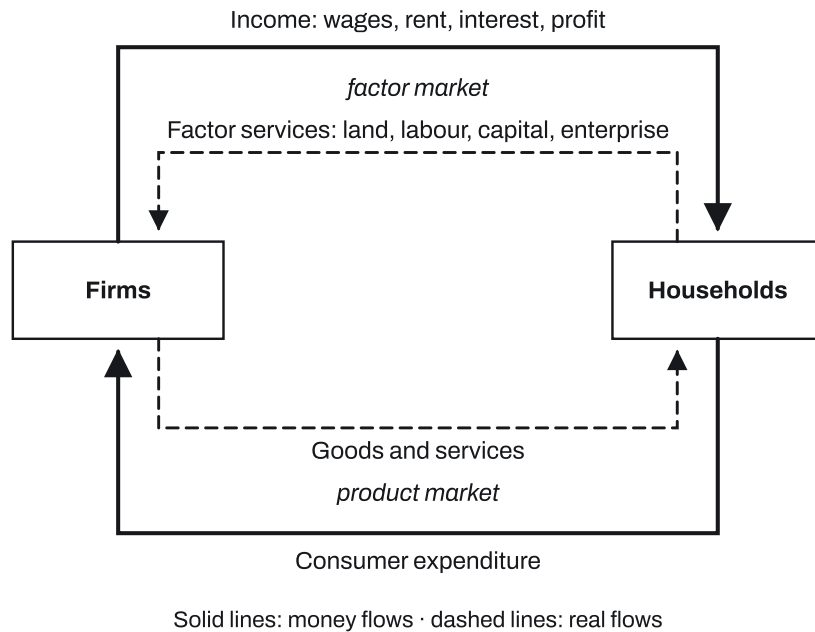
1. **Describe the circular flow of income in a closed economy:** money flowing between households and firms, and to and from the government, in an economy that does not trade with other countries.
2. **Describe the circular flow of income in an open economy:** the same flows plus the flows to and from the rest of the world (the international economy).
3. **Explain injections and leakages:** what adds spending to the flow (investment, government spending, exports) and what takes income out of it (saving, taxation, imports). The multiplier is not needed at AS.
4. **Explain equilibrium and disequilibrium:** national income is stable when total injections equal total leakages, and rises or falls when they are not equal. Marginal and average propensities are not needed.

Understand it

Two flows going round in opposite directions

Start with the simplest economy: just **households** and **firms**, no government, no trade, and households spend all their income.

- Households own the **factors of production** (land, labour, capital, enterprise). They sell **factor services** to firms in the **factor market**.
- Firms pay for them with **income**: wages for labour, rent for land, interest for capital and profit for enterprise.
- Households spend that income on the **goods and services** firms make, in the **product market**. This is **consumer expenditure**, and it becomes firms' revenue.
- Firms use the revenue to pay factor incomes again, and the flow goes round again.



There are two loops. The **money** loop (income and expenditure) goes one way round; the **real** loop (factor services and goods and services) goes the other way, because each payment is for something that moves the opposite way. If a question's diagram shows income going clockwise, then factor services (resources) go anticlockwise, and so on.

In this simple economy the money never leaves: every dollar of income is spent, so national income, output and expenditure all stay the same size year after year. This is why national output = national income = national expenditure (from National income statistics).

Leakages: income that is not passed on

In a real economy, not all income is spent on domestic firms' output. A **leakage** (also called a **withdrawal**) is income that leaves the flow:

- **Saving (S):** income households keep instead of spending, usually placed with banks and other financial institutions.
- **Taxation (T):** income taken by the government, such as income tax.
- **Imports (M):** spending on goods and services made in other countries, so the money goes to foreign firms.

Leakages make the flow **smaller**: firms receive less revenue than they paid out as income.

Injections: spending that does not come from households' income

An **injection** is spending on domestic firms' output that does not come from the consumption of domestic households:

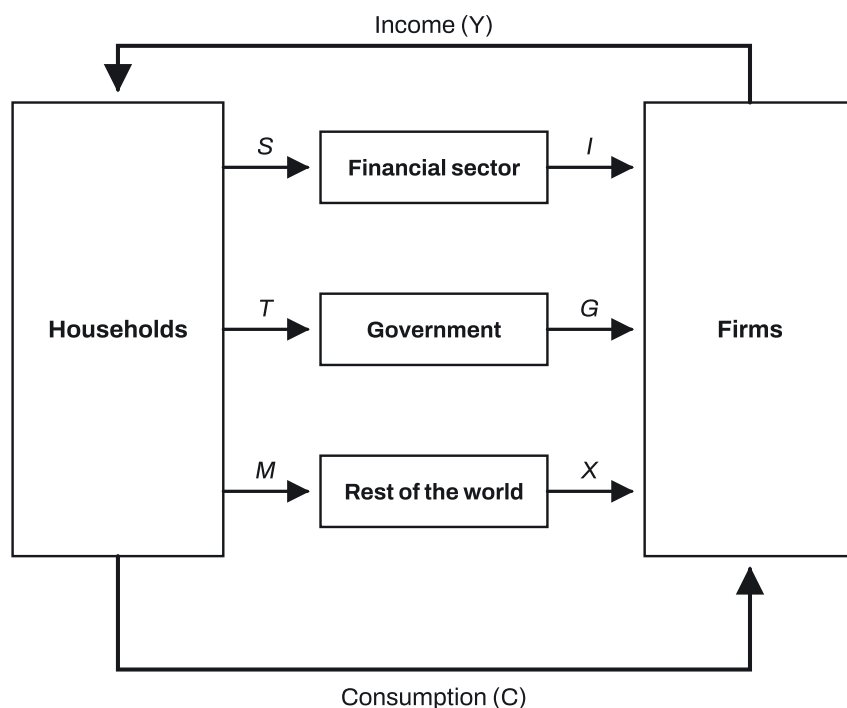
- **Investment (I):** firms' spending on capital goods such as machines, factories and new infrastructure.

- **Government spending (G)**: spending on public services and projects, such as building a road or paying teachers.
- **Exports (X)**: spending by foreigners on this country's goods and services.

Injectors make the flow **bigger**. They are decided mainly by things other than this country's income: firms' expectations of profit, government decisions, and incomes and prices abroad. So an injection is always a **cause** of a change in the flow. Leakages, by contrast, change as income changes: when income rises, people save more, pay more tax and buy more imports. Consumption (C) is part of the flow itself, so it is neither an injection nor a leakage.

Closed and open economies

- A **closed economy** does not trade with the rest of the world. It still has a government, a mistake many candidates make. With a government it has **three sectors**: households, firms and government. Its injections are I and G ; its leakages are S and T .
- An **open economy** trades with the rest of the world. Exports are added to the injections and imports to the leakages. Adding the financial sector gives the full picture below, often called the five-sector model.



Leakages: saving S , taxation T , imports M

Injectors: investment I , government spending G , exports X

How much the flow changes when a closed economy opens up depends on **how much it trades**. If exports and imports are a large share of national income, trade becomes a large injection and a large leakage, and events abroad (a recession in a trading partner, a change in the exchange rate) move national income a lot. If trade is small, the flow changes little.

Equilibrium and disequilibrium

National income is in **equilibrium** when it has no tendency to change. That happens when what leaks out of the flow is exactly replaced by what is injected:

$$\text{injections} = \text{leakages} : \quad I + G + X = S + T + M.$$

- If **injections > leakages**, more is being added to the flow than taken out. Firms' sales rise, they produce more and pay out more income, so **national income rises** (economic growth in the short run).
- If **injections < leakages**, firms' sales fall, output and incomes fall, so **national income falls**.

As income changes, leakages change with it (more income means more saving, tax and imports), so income keeps moving until leakages again equal injections: a **new equilibrium**.

Two points often tested:

1. **Only the totals need to match.** S need not equal I , T need not equal G , and X need not equal M . A budget deficit ($G > T$) can be balanced by a trade deficit ($M > X$) or by saving greater than investment. Rearranging the condition gives $(S - I) + (T - G) + (M - X) = 0$.
2. **Planned** injections and leakages are what matter. After the event, the accounts always add up; the question is whether what people **plan** to inject equals what they **plan** to withdraw.

A change causes **disequilibrium** only if it changes total injections by a different amount from total leakages. Investment up by \$15bn and government spending down by \$15bn leaves total injections the same, so no disequilibrium. Exports up by \$25bn **and** saving down by \$25bn raises injections and cuts leakages, so injections now exceed leakages by \$50bn and income rises. Households spending past savings (dissaving) work the same way: leakages fall and income rises.

Key facts and formulas

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

Formula	Status
Leakages (withdrawals) $W = S + T + M$	Learn it
Injections $J = I + G + X$	Learn it
Closed economy with government: equilibrium when $I + G = S + T$	Learn it
Open economy: equilibrium when $I + G + X = S + T + M$	Learn it
$(S - I) + (T - G) + (M - X) = 0$ at equilibrium	Learn it
Households' income is consumed, saved or taxed: $Y = C + S + T$	Learn it
National expenditure: $Y = C + I + G + (X - M)$	Learn it
Budget surplus = $T - G$; trade (current account) surplus = $X - M$	Learn it
Injections > leakages: income rises; injections < leakages: income falls	Learn it

How to do it

In the questions we have tagged for this topic (19 questions, 2023–2025), the types came up this often. We count question parts: one Paper 2 essay question has both its 8-mark and its 12-mark part on this topic, so the counts add to 20.

Question type	Questions
Multiple choice: injections, leakages and the direction of flows	6
Multiple choice: calculate with the equilibrium condition	5
Multiple choice: equilibrium and disequilibrium	4
Essay (a), 8 marks: explain the circular flow and consider	4
Essay (b), 12 marks: assess an effect on the circular flow	1

1. Multiple choice: injections, leakages and the direction of flows (6 questions)

1. **Sort every item** into injection (I, G, X), leakage (S, T, M) or neither (C , transfers inside the flow, loan repayments).
2. **An injection raises the flow, a leakage lowers it.** A rise in an injection or a fall in a leakage increases national income.
3. **Trace anything indirect** to one of the six: a higher interest rate cuts investment and encourages saving (flow falls); a higher exchange rate makes exports dearer and imports cheaper (flow falls); a bigger budget deficit means G rises relative to T (flow rises).

Variations you will meet:

- **"Which is an injection in an open economy?"** Look for spending on domestic output that does not come from households' consumption: a government project is G , a firm's new capital is I , foreigners' spending is X . Spending that stays inside the flow (consumption) or goes abroad (imports) is not an injection, and nor are purely financial transactions such as repaying loans.
- **"What is always a cause rather than a consequence?"** Look for an injection, because injections do not depend on this country's own income. Anything that rises or falls automatically as income changes (such as leakages or consumption) is a consequence.
- **"Immediate result of higher exports?"** National income rises. Imports, saving and tax may rise **later**, as a result of the higher income.
- **"Which changes increase the flow?"** (a yes/no table): only the injections, never higher imports or higher taxation.
- **Direction of flows on a diagram.** Money (income, consumer expenditure) goes one way round; real flows (resources or factor services, goods and services) go the other. Find which way one flow goes from the diagram, and the others follow.

2. Multiple choice: calculate with the equilibrium condition (5 questions)

1. **Write the condition:** $I + G + X = S + T + M$ (drop X and M for a closed economy).
2. **Fill in what you know.** If tax is not given, find it from $Y = C + S + T$. "Balanced budget" means $G = T$.
3. **Solve for the unknown**, or compare totals row by row in a table.
4. **Check against the options**, which are usually built from sign slips.

For example: in equilibrium, $S = 60$, $I = 45$, $T = 90$, $G = 100$, $M = 70$. Then $45 + 100 + X = 60 + 90 + 70 = 220$, so $X = 75$.

Variations you will meet:

- **A table of incomes.** Injections are often the same in every row; add up the leakages in each row and pick the income where they equal injections.
- **Budget and trade balances.** Use $(S - I) + (T - G) + (M - X) = 0$. A budget surplus makes $T - G$ positive; a trade deficit makes $M - X$ positive. For example, a budget surplus of \$15bn and a trade deficit of \$5bn with investment of \$40bn: $(S - 40) + 15 + 5 = 0$, so $S = 20$: saving is \$20bn.
- **Which combination of balances fits?** Rearranged, the budget surplus minus the trade surplus must equal $I - S$ (a deficit counts as a negative surplus). For example, with $S = 30$ and $I = 50$: a budget surplus of 30 and a trade surplus of 10 fits, since $30 - 10 = 20 = 50 - 30$. Test each option this way.
- **Exports and imports as a pair.** With X and M both unknown, you can only find $X - M$; choose the option with that difference.
- **Conclusions from a table of values.** Check the budget (G against T), trade (X against M) and totals ($I + G + X$ against $S + T + M$) before choosing. An economy with a government sector and trade is a **mixed, open** economy.

3. Multiple choice: equilibrium and disequilibrium (4 questions)

1. **State the condition in words:** planned injections equal planned leakages, in total.
2. **Test each statement** against it. Anything claiming that a single pair must match ($S = I$, $X = M$, $Y = C$) or that the government always adjusts is wrong.
3. **For "which causes disequilibrium?"**, add up the change in injections and the change in leakages for each option. If the two changes are equal (including both zero), equilibrium holds; if not, it is disequilibrium.

Variations you will meet:

- **"Which statement is correct?"** Usually the true one describes $S \neq I$ still allowing equilibrium, or dissaving raising national income.
- **Changes that cancel.** A rise in one injection matched by a fall in another (or a rise in one leakage matched by a fall in another) leaves the totals unchanged.

4. Essay (a), 8 marks: explain the circular flow and consider (4 questions)

These are point-marked: up to **3 marks for knowledge (AO1)**, **3 for analysis (AO2)** and **2 for evaluation (AO3)**, with 1 of the 2 kept for a justified conclusion.

1. **Draw a simple, labelled diagram** when asked (households, firms, arrows for income and expenditure, then S , T , M and I , G , X). Label the direction of the flows. An over-elaborate diagram with no explanation earns nothing extra.
2. **Knowledge (3 points)**: income flows from firms to households as payment for factor services; households spend it on firms' goods and services; the flow goes round continuously. In a closed economy with a government: injections I , G , leakages S , T , equilibrium at $I + G = S + T$.
3. **Analysis (3 points)**: explain injections and leakages; add X and M for an open economy; state the equilibrium $I + G + X = S + T + M$; explain what happens when injections exceed leakages (income rises) and when they fall short (income falls).
4. **Evaluation (2 points)**: answer the "consider" part with a judgement and a reason, then a one-line conclusion.

Variations you will meet:

- **Closed to open, and what decides how much it changes**: the extent depends on how important trade is (the size of X and M relative to national income) and whether X and M are close in size; conclude, for example, that a small, very open economy's flow changes far more than a large one that trades little.
- **Can it explain economic growth?** Injections above leakages raise national income, so the model explains short-run growth in demand and output; but it says nothing about the growth of productive capacity, a rise in money income may be only higher prices, and the model is a simplification. Conclude that it explains changes in national income better than long-run growth.
- **Which causes lasting disequilibrium, a budget deficit or a trade deficit?** A budget deficit is a net injection (income rises); a trade deficit is a net leakage (income falls). As income changes, leakages adjust, so either one on its own moves the economy to a new equilibrium rather than lasting disequilibrium. A judgement: a trade deficit caused by uncompetitive industries may last for years and keep dragging income down, while a government can change its budget quickly, so the trade deficit is more likely to last (or argue the opposite, with a reason).

5. Essay (b), 12 marks: assess an effect on the circular flow (1 question)

These are levels-marked: **8 marks for knowledge and analysis** (Level 3 needs accurate, relevant, explained points on **both** sides) and **4 for evaluation**. A one-sided answer is held to Level 2 and gets no evaluation marks.

1. **Define the circular flow** and say which injection or leakage the change is.
2. **One side, developed**: the injection raises spending, firms pay more to factors of production, households' incomes and spending rise, national income rises.
3. **Other side, developed**: leakages that go with it (imported materials, taxes, saving from the extra income) or cuts elsewhere (how it is paid for), so the net effect depends on injections against leakages.

4. **Evaluation and a justified conclusion:** "always" is rarely true. Weigh the size of the leakages, how the spending is financed, and the model's simplicity (it ignores time lags and effects such as pollution), then decide.

Worked examples

Example 1

Which change would reduce the circular flow of income in an open economy?

- **A** a fall in household saving
- **B** a fall in income tax rates
- **C** a rise in firms' spending on new machinery
- **D** a rise in spending on imported cars

[1]

Imports are a leakage: money spent on foreign cars leaves the flow and does not become income for domestic firms. The answer is **D**. (1)

A and B reduce leakages and C raises an injection, so all three increase the flow.

Example 2

An open economy with a government sector is in equilibrium. Households save \$80bn and pay \$120bn in taxes. Firms invest \$90bn, the government spends \$100bn, and spending on imports is \$150bn.

What is the value of exports, and what is the trade balance?

- **A** exports \$140bn, trade deficit of \$10bn
- **B** exports \$150bn, trade balanced
- **C** exports \$160bn, trade surplus of \$10bn
- **D** exports \$170bn, trade surplus of \$20bn

[1]

Leakages: $S + T + M = 80 + 120 + 150 = 350$. Injections must equal this: $90 + 100 + X = 350$, so $X = 160$ and $X - M = 160 - 150 = +10$. The answer is **C**. (1)

Check with the balances: $(S - I) + (T - G) + (M - X) = -10 + 20 - 10 = 0$. B assumes trade must balance, which equilibrium does not require.

Example 3

With the help of a circular flow of income diagram, explain the difference between the circular flow in a closed economy and in an open economy, and consider whether an increase in exports will always increase national income. [8]

Diagram: the second diagram in "Understand it", with households, firms, income and consumption arrows, and S , T , M out and I , G , X in.

The circular flow shows income paid by firms to households for the factor services they supply, as wages, rent, interest and profit (**1, AO1**). Households spend this income on firms' goods and services, which becomes firms' revenue, so the flow is continuous (**1, AO1**). In a closed economy the flow involves households, firms and the government: the injections are investment and government spending, the leakages saving and taxation, and income is in equilibrium where $I + G = S + T$ (**1, AO1**).

An injection is spending that adds to the flow without coming from households' consumption; a leakage is income that is not passed back to domestic firms (**1, AO2**). An open economy trades with the rest of the world, so exports become a third injection and imports a third leakage (**1, AO2**). Equilibrium is now where $I + G + X = S + T + M$: if injections exceed leakages, firms sell more, produce more and pay more income, so national income rises (**1, AO2**).

A rise in exports adds to injections, so on its own it raises national income. But it will not always: if imports, saving or taxes rise at the same time by as much (for example, because exporters buy imported parts), or another injection such as investment falls, total injections may not exceed total leakages (**1, AO3**). So a rise in exports increases national income only if it raises total injections above total leakages, which is likely but not certain (**1, AO3**).

(Knowledge 3, analysis 3, evaluation 2: **8/8**.)

Example 4

Assess whether an increase in government spending will always increase the circular flow of income in an economy. [12]

Model answer (outline of each paragraph):

- Definitions.** The circular flow is the flow of income from firms to households and of spending from households back to firms. Government spending is an injection, taxation a leakage, and national income is in equilibrium where $I + G + X = S + T + M$. (*Accurate knowledge: Level 3 needs this.*)
- Why it increases the flow.** Suppose the government spends \$20bn more on hospitals. Firms that build and equip them receive more revenue, employ more labour and buy more materials, so they pay out more wages, rent, interest and profit. Households' incomes rise, they spend more, and other firms' sales rise too. With injections now above leakages, national income rises until leakages catch up at a higher equilibrium. (*Developed chain of reasoning.*)

3. **Why it may not.** If the extra spending is paid for by raising taxes by \$20bn, the rise in the injection is matched by a rise in a leakage, and the flow need not grow. If the hospitals use imported equipment, much of the spending leaks straight out as imports. If the government borrows and this raises interest rates, firms may invest less, reducing another injection. (*The other side, explained: with both sides, Level 3, 7–8 of the 8.*)
4. **Evaluation.** Whether the flow grows depends on the change in **total** injections against total leakages, not on G alone. An increase financed by borrowing, spent on domestic goods, in an economy with unused resources, is very likely to raise income; one financed by equal taxes, or spent mostly on imports, may change it little. The model is also a simplification: it ignores time lags and whether the extra output is sustainable. (*Evaluation weighing the conditions.*)
5. **Conclusion.** It will not **always** increase the flow; it does so when it raises total injections above total leakages, which is most likely when it is financed by borrowing and spent on domestic output. (*Justified conclusion: full evaluation marks.*)

Common mistakes

- **Leaving the government out of a closed economy.** Examiners reported that many candidates thought a closed economy has no government. Closed means **no trade**; the government is still there, with G and T .
- **Not giving the equilibrium condition.** In March 2023, hardly any candidates wrote $I + G + X = S + T + M$, so they could not judge how much the flow changes as the economy opens. Write the closed and open conditions every time.
- **Describing only real flows.** Some candidates showed only factors of production and goods and services moving. The marks are for **income and expenditure** (money) flows, with their direction.
- **Diagrams that are too complicated and unexplained.** A simple labelled diagram with arrows, referred to in the text, earns the marks; extra detail does not.
- **Answering with AD/AS instead of the circular flow.** When asked how the circular flow explains growth, explain injections against leakages, not shifts in AD and AS.
- **Thinking each pair must balance.** Equilibrium needs **total** injections to equal **total** leakages. S , T and M can each differ from I , G and X .
- **Calling investment an injection without explaining it.** Say **why** it adds to the flow (spending on domestic output that becomes income) and weigh it against leakages.
- **Mixing up cause and consequence.** Saving, tax revenue and imports change **because** income changes; injections cause the change.

How to get the marks

- **"Explain"** (8-mark parts) is point-marked: each separate correct point earns 1, up to 3 for knowledge and 3 for analysis. Make each point a full sentence that says what flows, from whom, to whom.
- **"Consider"** and **"to what extent"** earn the 2 evaluation marks: a judgement with a reason, then a conclusion that answers the question in one sentence. An answer that deals only with a closed or only with an open economy (when both are asked for) is capped at 2 and gets no evaluation.

- **"With the help of a diagram"**: the diagram is worth a knowledge mark on its own. Label households, firms and each arrow (Y, C, S, T, M, I, G, X), and show which way each flows.
- **"Assess"** (12-mark parts): both sides, each a developed chain of reasoning (point, because, so), then weigh them. "Always" in the question is an invitation to say "not always, because ..., unless ...".
- **Use the notation**: writing $I + G + X = S + T + M$ and saying what happens when one side is larger gets analysis marks quickly.
- **Multiple choice**: write the six letters in the margin and sort each option; for numbers, write the equilibrium equation first.

Quick check

1. Say whether each is an injection, a leakage or neither: (a) spending by foreign tourists in the country; (b) income tax; (c) households' spending on locally made food; (d) firms buying new delivery vans; (e) buying goods from abroad.
2. In an economy, investment is \$120bn, government spending \$110bn and exports \$70bn at every level of income. At incomes of \$400bn, \$500bn, \$600bn and \$700bn, saving is 40, 50, 60 and 70; taxes are 80, 100, 120 and 140; imports are 80, 100, 120 and 140 (all \$bn). (a) What is the equilibrium level of national income? (b) What happens to national income if it is \$500bn?
3. A closed economy with a government is in equilibrium. Saving is \$60bn and investment \$80bn. What is the government's budget balance?
4. An open economy is in equilibrium with a budget surplus of \$25bn and investment of \$70bn. Saving is \$55bn. What is the trade balance?
5. Explain why an economy can be in equilibrium even though saving is not equal to investment. **[2]**

Answers

1. (a) Injection: exports. (b) Leakage: taxation. (c) Neither: consumption is part of the flow. (d) Injection: investment. (e) Leakage: imports.
2. (a) $\text{Injections} = 120 + 110 + 70 = 300$. Leakages are 200, 250, 300 and 350 at the four incomes, so equilibrium is at **\$600bn**, where leakages = 300 = injections. (b) At \$500bn, injections (300) exceed leakages (250) by \$50bn, so spending on firms' output is more than the income paid out: output and income **rise** towards \$600bn.
3. $I + G = S + T$, so $T - G = I - S = 80 - 60 = 20$: a **budget surplus of \$20bn**.
4. $(S - I) + (T - G) + (M - X) = 0$: $(55 - 70) + 25 + (M - X) = 0$, so $M - X = -10$: a **trade surplus of \$10bn** (X exceeds M by \$10bn).
5. Equilibrium needs total injections to equal total leakages, not each pair (1). If investment is greater than saving, this can be balanced by taxes greater than government spending, or imports greater than exports (1).

Past questions to try

- [9708/13/M/J/24 Q17](#): drawing conclusions from a table of injections and leakages.
- [9708/13/O/N/23 Q18](#): finding saving from the budget and trade balances.
- [9708/11/O/N/23 Q24](#): which change causes disequilibrium.
- [9708/23/M/J/23 Q4](#): the circular flow diagram and an essay on investment in infrastructure.