What moves exchange rates: payments flows, policy, intervention and crises

Economics

1 A story: every payment is an order

- Each payment is an order to buy or sell a currency
- Imports: Torvale sells tors to pay abroad
- Foreign lending or investing: someone buys tors
- The balance of payments records every order

IN THE LESSON

- Picture a small trading town with its own coins.
- Whenever a shopkeeper buys goods from a visitor's country, she must first swap town coins for the visitor's money.
- That swap is an order to sell town coins.
- Whenever a visitor buys from her, or lends her money, someone swaps the other way, an order to buy town coins.
- A currency's price is simply what happens when all these orders meet.
- Torvale is that town, on a big scale.
- When Torvale imports more than it exports, its firms sell tors to pay for the gap.

2 How a deficit is paid for

The deficit

Imports exceed exports → Firms sell tors → Gap to be financed

The financing

Foreigners buy bonds → They buy tors → Financial account surplus

IN THE LESSON

- Here is the chain, drawn in two rows.
- Start with the top row.
- Torvale imports more than it exports, so it runs a current account deficit.
- Its firms must sell tors to buy the foreign money to pay.
- Now the bottom row.
- Somebody has to hand over foreign money for those tors, and they do it because they want to buy something in Torvale: its government bonds, its company shares, its property, or they simply lend to its banks.
- Those purchases are a surplus on the financial account.
- So the deficit on top is matched, step by step, by net inflows underneath.

3 The balance of payments identity

Current + capital + financial + discrepancy = 0

Current account	Trade, income, transfers
Capital account	Debt relief, property rights
Financial account	Investment flows, reserves
Statistical discrepancy	Missed transactions, the plug

IN THE LESSON

- Now the rule that sits behind that chain.
- The balance of payments has three accounts, and together they add up to zero.
- The current account covers trade in goods and services, income earned abroad and transfers.
- The capital account is small: debt forgiveness and the transfer of property rights.
- The financial account records purchases and sales of foreign assets, including the central bank's reserves.
- In real statistics the three never quite match, because some transactions are missed, so there is a fourth item, the statistical discrepancy, which makes the sum come out at zero.

4 Example 1: Torvale's payments for one year

Torvale, billions of tors; GDP is 1,000

Goods, income, transfers	−34 − 9 + 3	**−40**
Current account	4% of GDP	**−40**
Capital account	small	**+1**
Financial account	net foreign purchases	**+42**
Statistical discrepancy	to reach zero	**−3**

IN THE LESSON

- Example one.
- Ines pulls the figures for Torvale, in billions of tors.
- The economy produces a thousand billion a year.
- Goods and services trade is a deficit of thirty four.
- Income earned abroad nets to a deficit of nine, because Torvale pays interest on its foreign debts.
- Transfers are plus three.
- Add them up and the current account is minus forty, which is four per cent of G D P.
- The capital account is plus one.
- Foreigners bought a net forty two billion of Torvale's assets, so the financial account is plus forty two.
- Check the total.
- Minus forty, plus one, plus forty two comes to plus three, so the statistical discrepancy must be minus three to bring it back to zero.

5 Short run and long run, drawn

Chart: Strength of the tor vs Time (years)

- Inflows lift it
- Reversal
- Claims weigh on it

IN THE LESSON

- Now a picture of the two horizons.
- Time in years runs along the bottom, and the height of the line is the strength of the tor.
- This is an illustration, not real data.
- Follow the line from the left.
- For the first few years Torvale runs its deficit, yet the tor climbs.
- Foreign investors are buying so many bonds that inflows are bigger than the deficit, and so the net orders favour the tor.
- This is the trap in the outcome.
- A deficit does not mean an immediate fall.
- Then comes the turn.
- Inflows slow and reverse, because financial flows are far larger than trade flows and can change direction in weeks.
- The line drops fast, then settles lower, where the claims built up along the way weigh on the price.

6 Claims on Torvale pile up

Net foreign liabilities, % of GDP

Year 0	**30**
Year 2	**38**
Year 4	**46**
Year 6	**54**

Illustration: a deficit of 4% of GDP, every year

IN THE LESSON

- While the tor was rising, something quieter was happening.
- Each year of deficit left foreigners holding more of Torvale.
- Take the four per cent deficit from example one and suppose it repeats every year.
- Net foreign liabilities, what Torvale owes the world on balance, start at thirty per cent of G D P.
- After two years they are thirty eight, after four they are forty six, and after six years they are fifty four.
- The bars show this.

7 Two horizons, two stories

- Short run: financial flows dwarf trade flows
- They can reverse fast: hot money, then a rush out
- Long run: foreigners hold ever more claims
- They want a lower price or a higher return

IN THE LESSON

- Put the two ideas together.
- In the short run, capital flows dominate.
- A single day's trading in investment securities dwarfs a day's trade in goods, and investors can reverse a position in hours.
- That is why emerging markets see surges followed by sharp reversals.
- In the long run, the stock of claims matters.
- This is the portfolio balance view.
- Foreigners cannot keep putting a rising share of their wealth into one country without asking for something in return, either a lower price for the assets, which means a weaker currency, or a higher return.
- A persistent deficit therefore tends to weaken a currency over many years.

8 Example 2: what the portfolio balance view asks for

Quote: tors per bren; expected rate in one year is 2.0000

Premium asked at 30% of GDP	paid through yields	**2%**
Premium asked at 54% of GDP	yields cannot rise	**4%**
Extra return from the tor	4% − 2%	**2%**
Spot that delivers it	2.0000 × 1.02	**2.0400**
Fall in the tor	2.0000 ÷ 2.0400 − 1	**−1.96%**

IN THE LESSON

- Example two puts numbers on that demand.
- Quote the rate as tors per bren, so a higher number is a weaker tor.
- When foreigners held claims worth thirty per cent of G D P, they asked a premium of two per cent a year to hold Torvale's bonds, and Torvale paid it through its yields.
- At fifty four per cent of G D P, they ask four per cent.
- Suppose yields cannot rise.
- The extra two per cent must come from the currency, so the tor must be expected to appreciate by two per cent over the year.
- Ines expects two tors per bren in a year.
- If the tor is to be expected to gain two per cent towards two tors per bren, it must start weaker than that today, so spot is two times one point zero two, which is two point zero four.
- That is a fall of one point nine six per cent in the tor.

9 Policy: first ask how freely money moves

- Two channels: interest rates and price levels
- High mobility: money chases the higher rate
- Low mobility: trade flows set the price
- First question: how freely does capital move?

IN THE LESSON

- Now the second idea: what a government and a central bank can do to the price of their currency.
- Policy moves a currency through two channels.
- The first is interest rates: a higher rate attracts investment money and lifts the currency.
- The second is prices: more money chasing the same goods raises prices and cuts what the currency is worth.
- The Mundell-Fleming model studies the first channel in the short run, and its answer depends on capital mobility.
- So before Ines says anything about a policy, she asks one question.
- How freely can capital cross this border?

10 Mundell-Fleming with free capital

High capital mobility

Policy mix	Currency
Tight money, loose fiscal	Strong rise
Loose money, tight fiscal	Strong fall
Tight money, tight fiscal	Ambiguous
Loose money, loose fiscal	Ambiguous

IN THE LESSON

- This table is the model when capital moves freely.
- Read it as two policies, each pushing interest rates one way.
- Tight monetary policy raises rates.
- Fiscal expansion, that is more government spending or lower taxes, adds to borrowing and demand, and it too pushes rates up.
- When money is free to move, higher rates pull in investors, so the currency appreciates.
- Look at the first row.
- Tight money with loose fiscal policy pushes rates up twice, so the currency appreciates strongly.
- The second row is the reverse: loose money with tight fiscal policy pushes rates down twice and the currency depreciates strongly.
- In the last two rows, one policy raises rates and the other lowers them.
- The model cannot say who wins, so the answer is ambiguous, not zero.

11 Example 3: a rate rise with free capital

Quote: tors per bren; expected rate 2.0000; capital flows freely

Monetary tightening	policy rate 3.0% to 4.5%	**+1.5**
Fiscal expansion	illustrative lift to rates	**+0.5**
Net rise in home rates	1.5 + 0.5	**+2.0**
Spot that fits	2.0000 ÷ 1.02	**1.9608**
Change in the tor	2.0000 ÷ 1.9608 − 1	**+2.0%**

IN THE LESSON

- Example three.
- Torvale's central bank lifts its policy rate from three per cent to four and a half, a rise of one and a half points.
- The government also announces extra spending, and Ines judges that the added borrowing lifts market rates by another half a point, as an illustration.
- Both policies push the same way, so home rates rise by two points relative to abroad.
- With free capital, parity logic says the tor must now be expected to slide back by two per cent a year, so it has to start two per cent too strong.
- Ines expects two tors per bren in the long run.
- The spot today is two divided by one point zero two, which is one point nine six zero eight.
- The tor has appreciated by two per cent.

12 Example 4: fiscal stimulus with trade flows

Quillon, billions of quills; capital barely moves

Fiscal stimulus	tax cuts and spending	**50**
Rise in income	50 × 1.2	**60**
Rise in imports	60 × 30%	**18**
Change in trade balance	imports up, nothing else	**−18**
Pressure on the quill	no inflows to pay for it	**Weaker**

IN THE LESSON

- Example four moves to the other pipe.
- Quillon is Torvale's neighbour.
- It has strict capital controls, so only trade moves its currency, the quill.
- Its government announces a fiscal stimulus of fifty billion quills, and leaves monetary policy alone.
- The stimulus raises national income by one point two times as much, sixty billion, through the usual multiplier.
- For every extra quill of income, people spend thirty per cent on imports.
- So imports rise by eighteen billion, and the trade balance worsens by eighteen.
- With no investment money to finance the gap, the quill has to weaken to bring imports and exports back into balance.
- The same policy that strengthened a currency with free capital weakens one with low mobility.
- That is why Ines always asks about mobility first.

13 Prices and debt: the monetary and portfolio views

- More money growth: a weaker currency in time
- Sticky prices: the spot overshoots its long-run level
- Portfolio balance: lasting deficits weigh on a currency
- Debt must be held, at a lower price or higher return

IN THE LESSON

- Mundell-Fleming is a short-run, interest-rate story.
- Two other approaches look at prices and debt.
- The monetary approach says a currency is the price of one country's money in terms of another's.
- If a central bank lets money grow faster, prices rise faster, and over time the currency loses value, as purchasing power parity says.
- Now add a twist.
- In the short run, shop prices are sticky, they adjust slowly, while exchange rates adjust at once.
- So after a permanent rise in the money supply, the currency falls by more than its long-run amount at first, and then recovers part of the way.
- That is overshooting.
- The portfolio balance approach adds the earlier idea: persistent deficits, financed by growing public debt, weaken a currency over time as investors demand a lower price or a higher return.

14 The overshooting rule of thumb

Spot today ≈ Long-run spot × (1 + rate gap)^n
Long-run spot = old spot × (1 + money growth)

Spot today	Rate quoted home per foreign
Long-run spot	Where prices say it ends up
Rate gap	Foreign rate minus home rate
Years, n	Years the gap lasts

IN THE LESSON

- To size an overshoot, use one rule built on parity.
- A permanent rise in the money supply raises prices by the same percentage in the long run, so the long-run spot rate is the old rate times one plus the money growth.
- In the short run, the central bank's easier policy leaves home interest rates below foreign rates.
- Parity says the home currency must then be expected to appreciate each year by about that rate gap, to make up for the lower yield.
- For the currency to appreciate towards its long-run level, it must start beyond it.
- So the spot today is the long-run spot, times one plus the rate gap, raised to the power of the number of years the gap lasts.
- This is an approximation, but a useful one.

15 Example 5: Torvale's overshoot

Quote: tors per bren; money +8% for good; rate gap 2 points, 3 years

Old spot	tors per bren	**2.0000**
Long-run spot	2.0000 × 1.08	**2.1600**
Spot today	2.1600 × 1.02^3	**2.2922**
Move in the tor, today	2.0000 ÷ 2.2922 − 1	**−12.7%**
Overshoot beyond long run	2.2922 − 2.1600	**0.1322**

IN THE LESSON

- Example five.
- The tor is two tors per bren.
- The Torvale central bank, worried about growth, announces a permanent eight per cent rise in the money supply.
- Prices are sticky, so for the next three years Torvale's interest rates sit two points below those abroad.
- Step one: in the long run prices rise eight per cent, so the long-run rate is two times one point zero eight, which is two point one six.
- Step two: the tor must be expected to appreciate two per cent a year for three years, so spot today is two point one six times one point zero two cubed, which is two point two nine two two.
- The tor loses twelve point seven per cent of its value at once, though the long-run fall is smaller.

16 The overshoot, drawn

Chart: Tors per bren vs Time (years)

- Old rate
- Long-run level
- Overshoot

IN THE LESSON

- Here is the overshoot as a picture.
- Time in years runs along the bottom, and the height of the line is the number of tors per bren, so higher means a weaker tor.
- The lower guide is the old rate, two.
- The upper guide is the long-run rate, two point one six, where prices say the tor will end up.
- Now follow the line.
- It runs flat at two until the announcement, then jumps straight up past the long-run guide, to about two point two nine.
- Then it drifts down, two per cent a year, as the tor recovers, and settles on the long-run level after three years.
- The gap between the peak and the guide is the overshoot.

17 Four mistakes to avoid so far

- 1. A deficit does not mean an instant fall
- 2. Fiscal expansion: ask about capital mobility first
- 3. A mixed policy mix is ambiguous, not zero
- 4. Sticky prices: the spot overshoots, then returns

IN THE LESSON

- Before the third idea, four mistakes that cost marks.
- One.
- Assuming a current account deficit means the currency falls now.
- If inflows more than finance the deficit, the currency can rise for years.
- Two.
- Treating fiscal expansion as always good for a currency.
- With free capital it lifts rates and the currency appreciates, but with low mobility it raises imports and the currency weakens.
- Three.
- Reading a mixed policy mix as zero.
- Tight money with tight fiscal policy is ambiguous, because the effect depends on which is larger.
- Four.
- Forgetting overshooting.
- After a permanent rise in the money supply, the spot goes beyond its long-run level first, and then comes back part of the way.

18 Why authorities step in

- Damp volatility, so firms can plan
- Resist an appreciation that hurts exporters
- Defend a peg: a promise to hold a rate
- Slow hot money and asset bubbles

IN THE LESSON

- Now the third idea.
- Governments and central banks do not always leave a currency to the market.
- Imagine a ferry captain in a storm.
- She cannot stop the waves, but she can steer a bit.
- Authorities intervene in currency markets, buying or selling currency, for four main reasons.
- To damp volatility, because wild swings make planning hard.
- To resist an appreciation that hurts exporters.
- To defend a peg or a target, which is a promise to hold a rate.
- And to slow hot money flows that could feed asset bubbles.
- Whether any of this works depends on two things: how big the market is compared with the central bank's reserves, and which direction the pressure runs.

19 Two directions, two limits

Weak currency

Sell reserves → Buy home currency → Limit: reserves run out

Strong currency

Buy foreign currency → Sell home currency → Limit: cost and inflation

IN THE LESSON

- The two directions of intervention face different limits, drawn here in two rows.
- In the top row, the market wants to sell the currency and push it down.
- To defend it, the central bank sells foreign reserves and buys its own currency.
- The limit is hard: it can only do this while the reserves last.
- In the bottom row, the market wants to buy the currency and push it up.
- To resist, the central bank buys foreign currency and sells its own, which it can create without limit.
- The catch is the side effect.
- The new home money adds to the money supply, so the bank usually sterilises, meaning it sells its own bills to soak the money back up.
- That costs interest.
- If it does not sterilise, the extra money feeds inflation.

20 Reserves against a day's trading

Reserves, in days of trading

Large developed	**0.2**
Mid-size emerging	**2.0**
Torvale	**7.5**

Illustration: reserves divided by a day's turnover

IN THE LESSON

- Size matters, and here is the reason.
- Intervention works by changing the balance of orders.
- If daily trading in a currency is huge, a central bank's reserves are a small drop.
- Take a large developed market where reserves are one hundred and fifty billion and a day's trading is seven hundred and fifty.
- Reserves cover only two tenths of one day's trading.
- In a mid-sized emerging market, reserves of thirty billion against a day of fifteen cover two days.
- In Torvale, reserves are forty five billion against a daily turnover of six, which is seven and a half days.

21 Example 6: the cost of resisting a rise

Torvale, billions of tors; bills pay 4%, reserves earn 2%

Foreign currency bought	paid in new tors	**12**
Bills sold to mop up	same amount	**12**
Interest paid on the bills	12 × 4%	**0.48**
Interest earned on reserves	12 × 2%	**0.24**
Net cost each year	0.48 − 0.24	**0.24**

IN THE LESSON

- Example six.
- Foreign money is pouring into Torvale and the tor is rising, which hurts the exporters.
- The central bank buys twelve billion tors' worth of foreign currency, and pays with newly created tors.
- To stop that money feeding inflation, it sterilises: it sells twelve billion of its own bills to take the tors back.
- Those bills pay four per cent a year, so the bank pays out forty eight hundredths of a billion.
- Meanwhile the foreign reserves it bought earn only two per cent, twenty four hundredths of a billion.
- The net cost of the policy is the difference, twenty four hundredths of a billion a year.

22 Example 7: defending a weak currency

Torvale, billions; reserves and weekly sales

Reserves	total stock	**45**
Kept back for imports	safety floor	**15**
Usable reserves	45 − 15	**30**
Sales to defend the rate	per week	**9**
Weeks the defence lasts	30 ÷ 9	**3.33**

IN THE LESSON

- Example seven goes the other way.
- Investors are selling tors, and the central bank has promised to hold the rate.
- Its reserves are forty five billion.
- But it needs to keep fifteen billion back, to pay for essential imports and as a safety margin, so only thirty is usable.
- Suppose the market sells nine billion a week.
- Thirty divided by nine is three point three three weeks.
- After that, the defence fails.
- And markets can see this arithmetic.
- Traders who spot the countdown sell sooner, making the weekly pressure bigger and the clock shorter.
- This is the trap in the outcome.
- A large reserve stock looks safe, but reserves do not make any peg defensible, because the question is how much selling pressure there could be, not how big the pile is.

23 Capital controls: a temporary tool

- Price based: a tax on inflows, idle deposits
- Quantity based: holding periods, ownership caps
- Useful against a surge of hot money, for a while
- Costs: distorted allocation, evasion over time

IN THE LESSON

- Besides intervention, a government can slow money directly.
- Capital controls are rules that limit how freely money crosses the border.
- Some are price based, such as a tax on foreign purchases of local bonds, or a rule that part of an inflow must sit idle at the central bank.
- Others are quantity based, such as a minimum holding period, or a cap on how much foreigners may own.
- But they have costs.
- They distort where money is allocated, they discourage honest long-term investors too, and they erode over time as investors find ways around them.
- So the curriculum treats controls as a legitimate temporary tool, not a lasting cure.

24 Example 8: a tax on short-term inflows

Home 5%, abroad 3%, 1% tax on purchases

Yearly gap in rates	5% − 3%	**2%**
Three-month investor	2% ÷ 4 − 1%	**−0.5%**
One-year investor	2% − 1%	**+1%**
Break-even holding period	1% ÷ 2% a year	**0.5 years**
Money it deters	short-term hot money	**Most**

IN THE LESSON

- Example eight.
- Torvale's short-term bills pay five per cent a year, while bills abroad pay three.
- Foreign investors see a gap of two points and pour in.
- Torvale then taxes foreign purchases of short bills at one per cent of the amount bought.
- Look at a three month investor.
- The gap for a quarter is two per cent divided by four, half a point, but the tax costs one.
- The investor loses half a point and stays away.
- Now a one year investor.
- The gap is two points, minus the one point tax, so they still gain one.
- The break-even holding period is one divided by two, half a year.
- The tax deters short-term hot money but barely touches long-term money, and evasion will still erode it over time.

25 Crises build up slowly

- Prices: real exchange rate, inflation, trade terms
- Credit: fast loan growth, money outgrowing reserves
- Flows: inflows reversing, reserves falling
- Also: weak output, banking stress

IN THE LESSON

- Now the last idea: how to see a currency crisis coming.
- Think of a dam.
- It does not burst the moment the water is highest.
- Cracks appear for months, in places that are easy to see and easy to explain away.
- A currency crisis is a sudden, large fall in a currency, often after a failed defence, and it usually follows a recognisable build-up, though the timing is very hard to call.
- The warning signs fall into three groups.
- Prices: a real exchange rate well above its historical average, inflation higher than at trading partners, and worsening terms of trade.
- Credit: rapid domestic credit growth, often after financial liberalisation, and broad money growing fast against reserves.
- Flows: large inflows that begin to reverse, and falling reserves.

26 Torvale's dashboard

Fifth light: inflation 6 points above partners

Indicator	Reading
Real exchange rate (avg = 100)	124
Reserves, billions	48 to 31
Bank credit growth, yearly	27%
Terms of trade (base 100)	100 to 86

IN THE LESSON

- Back to Ines and Torvale.
- She builds a dashboard of the signs, and the readings are here.
- The real exchange rate, measured against its ten year average of one hundred, stands at one hundred and twenty four: Torvale is expensive.
- Reserves have fallen from forty eight billion to thirty one.
- Bank credit grew twenty seven per cent last year, after the banking system was opened up.
- The terms of trade, the price of what Torvale sells compared with what it buys, have slipped from one hundred to eighty six.
- Inflation also runs six points above trading partners.
- Five lights are on at once, and no single line calls a crisis, so Ines reads them together.

27 Example 9: putting numbers on the signs

Torvale: readings against their norms

Real rate above average	124 ÷ 100 − 1	**+24%**
Change in reserves	31 ÷ 48 − 1	**−35.4%**
Change in terms of trade	86 ÷ 100 − 1	**−14%**
Broad money ÷ reserves, before	120 ÷ 48	**2.50**
Broad money ÷ reserves, now	200 ÷ 31	**6.45**

IN THE LESSON

- Example nine turns the dashboard into figures.
- The real exchange rate is one hundred and twenty four against an average of one hundred, so the currency is twenty four per cent above its average.
- Reserves fell from forty eight to thirty one: thirty one divided by forty eight, minus one, is minus thirty five point four per cent.
- The terms of trade fell from one hundred to eighty six, down fourteen per cent.
- Now money against reserves.
- Three years ago broad money was one hundred and twenty billion against reserves of forty eight, two and a half times.
- Today broad money is two hundred against reserves of thirty one, six point four five times.
- The claims that could be turned into foreign money have more than doubled relative to the stock to meet them.

28 How the build-up turns into a run

Build-up

Liberalisation → Credit boom → Inflows surge

The turn

Inflows reverse → Reserves fall → Currency attack

IN THE LESSON

- Here is the usual order of events, in two rows.
- In the top row, Torvale opens up its banking system, which is financial liberalisation.
- Credit booms, because banks can borrow abroad and lend freely.
- Foreign money surges in, lifting the currency and the real exchange rate, and covering the deficit.
- In the bottom row the turn begins.
- Something shakes confidence, perhaps weaker output or a bank in trouble, and inflows start to reverse.
- Reserves fall as the central bank defends the rate.
- Investors, seeing the countdown from the earlier example, join the rush, and the currency attack arrives.

29 Contagion and the headline trap

- Contagion: a crisis next door can start an attack
- Comfortable deficits do not make a country safe
- Never rely on one or two headline numbers
- Signals measure risk, not the date

IN THE LESSON

- Two more ideas complete the picture.
- The first is contagion.
- A crisis in one economy can trigger an attack on another that looks similar, even when its own fundamentals are only moderately weak.
- The second is the headline trap.
- Ines's colleague says Torvale is safe because its current account deficit is small and its budget is balanced.
- But crises can strike countries whose current account and fiscal positions look comfortable, if the real exchange rate is high, credit is booming and reserves are thin.
- Relying on one or two headline numbers is the mistake.
- The skill is reading many signals together, and accepting that timing cannot be forecast.

30 Example 10: early-warning systems and false alarms

Rule: flag at three or more of six signals

Crisis countries flagged	7 of 10	**70%**
Calm countries flagged	8 of 40	**20%**
Crises missed	10 − 7	**3**
Share of flags that were false	8 of 7 + 8	**53%**

IN THE LESSON

- Example ten shows the trade-off of an early-warning system.
- Ines tests a rule on past data: flag a country when three or more of six signals light up.
- Torvale has five lit, so it is flagged.
- Across fifty countries studied, ten went on to have a crisis, and the rule flagged seven of them, a hit rate of seventy per cent.
- Among the forty calm countries, it also flagged eight, a false alarm rate of twenty per cent.
- It missed three real crises.
- Count all the flags: fifteen, of which eight were false, fifty three per cent.
- Crises are rare, so even a decent rule raises many false alarms.
- A system that combines many signals accepts that.

31 Recap: four ideas in one page

- Inflows can outrun a deficit; claims weigh later
- High mobility: rates rule; low: trade rules
- Intervention: reserves limit defence, cost limits resistance
- Crisis signs: price, credit, flows, read together

IN THE LESSON

- Let's pull it together.
- Idea one: every balance of payments flow is an order for a currency.
- A current account deficit is matched by net inflows, and if inflows exceed the deficit, the currency can rise for years.
- In the long run, growing claims push down the price or push up the return.
- Idea two: ask about capital mobility first.
- With free capital, tight money and fiscal expansion raise rates and lift a currency, and mixed mixes are ambiguous.
- With low mobility, trade dominates, and a stimulus weakens the currency.
- Sticky prices create overshooting.
- Idea three: intervention works better in small markets with big reserves, and each direction has a limit.
- Idea four: crises show many signs together, and contagion matters.

32 Try three quick questions

1. Deficit, but foreign bond purchases exceed it. What can the currency do?
   Answer: Rise, even for years: net orders favour it.
2. High mobility: tight money plus fiscal expansion. Effect on the currency?
   Answer: Strong appreciation: both lift interest rates.
3. Reserves 45, floor 15, sales 9 a week. How long can the peg be held?
   Answer: 30 ÷ 9 = 3.33 weeks.

IN THE LESSON

- Now try three quick questions yourself.
- Pause after each one.
- Question one.
- A country runs a current account deficit, but foreign bond buying is larger than the deficit.
- What can happen to the currency?
- The answer is that it can rise, even for years, because net orders favour the currency.
- Question two.
- With high capital mobility, a central bank tightens policy while the government expands its budget.
- What happens?
- Both raise rates, so the currency appreciates strongly.
- Question three.
- Reserves are forty five billion, fifteen billion must be kept back, and the market sells nine billion a week.
- How long does the defence last?
- Thirty divided by nine, about three point three weeks.