Charta | LESSON NOTES

Monetary and Fiscal Policy: Stability and Trust

FRM Part II

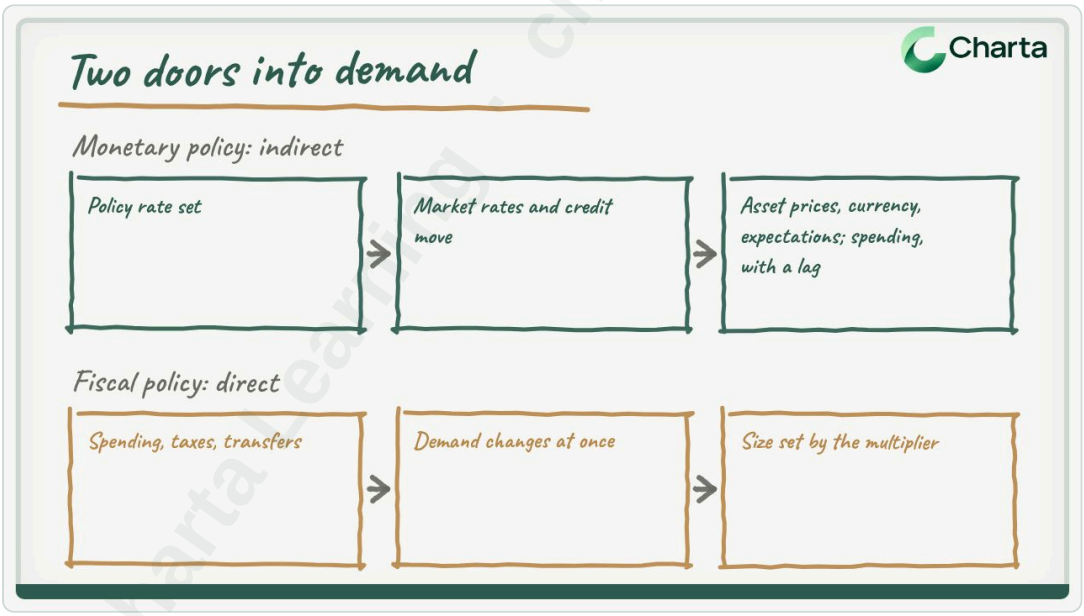
1 A story: two policies, one economy

- Corvania: inflation climbing; the ministry plans to borrow
- Central bank: our rate rule is fine
- Ministry: our deficit is modest
- Yet bond yields rise and the currency slips
- Stability is one joint test, held together by trust

IN THE LESSON

- Imagine Corvania.
- Inflation has started to climb, and the central bank is worried.
- At the same time, the finance ministry wants to spend more on roads and pensions, and it plans to borrow to do so.
- Each side checks its own policy and declares it sound.
- The central bank says its rate rule is fine.
- The ministry says its deficit, the gap between spending and revenue, is modest.
- Yet investors start to demand higher yields on Corvanian bonds, and the currency slips.
- The lesson of this topic is that stability is not two separate tests that each policy passes alone.
- It is one joint test, and trust in both institutions is what holds it together.

2 Two doors into demand



IN THE LESSON

- Both policies steer demand, meaning total spending in the economy, but through different doors.
- Look at the first row, monetary policy, which works indirectly.
- The central bank sets its policy rate, the short term interest rate it controls.
- That moves market rates and credit conditions, the price and the availability of loans.
- Those in turn move asset prices and wealth, the exchange rate, and expectations, and only then does spending change, with a lag of many months.
- Now the second row, fiscal policy, which acts directly.
- The government changes its spending, its taxes or its transfers, such as pensions and benefits.
- That changes demand at once, because the government is itself a buyer, or puts money straight into people's pockets.
- How much output moves is set by the multiplier.

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3 The channels of monetary policy

- Interest rates: borrowing dearer, saving more attractive
- Credit: banks lend less, on stricter terms
- Asset prices and wealth: bonds, shares, houses fall
- Exchange rate: currency strengthens
- Expectations: belief in low inflation shapes prices, wages

IN THE LESSON

- Let us open the monetary door wider, because it has five channels.
- The interest rate channel: higher rates make borrowing dearer and saving more attractive, so households and firms spend less.
- The credit channel: banks lend less, and on stricter terms, when rates rise and borrowers look weaker.
- The asset price and wealth channel: higher rates lower the value of bonds, shares and houses, so people feel poorer and spend less.
- The exchange rate channel: higher rates attract foreign money, the currency strengthens, imports get cheaper and exports dearer.
- And the expectations channel: if people believe the central bank will hold inflation down, they set prices and wages accordingly, which does much of the work for it.
- All five act with lags.

4 The fiscal multiplier

Output change = multiplier × fiscal impulse

Output change	Change in GDP
Multiplier	Output per unit of impulse
Fiscal impulse	Extra spending, or tax cut

IN THE LESSON

- The fiscal door is simpler to write down.
- The change in output equals the multiplier times the fiscal impulse.
- The output change is how much the economy's total production, its G D P, moves.
- The multiplier is the output gained for each unit of extra spending or tax cut.
- It is usually larger for government purchases than for tax cuts, because part of a tax cut is saved.
- The fiscal impulse is the change in spending or taxes itself.
- The multipliers we use next are assumptions, not estimates from any report.

5 Example 1: Corvania's two fiscal plans

GDP 1,000bn crowns. Plan A: spend 20bn more (multiplier 0.8). Plan B: cut taxes 20bn (0.5)

Plan A: output gain	0.8 × 20bn	**+16bn**
Plan A: share of GDP	16 ÷ 1,000	**+1.6%**
Plan B: output gain	0.5 × 20bn	**+10bn**
Plan B: share of GDP	10 ÷ 1,000	**+1.0%**

IN THE LESSON

- Corvania's G D P is one thousand billion crowns.
- The ministry weighs two plans of twenty billion crowns each.
- Plan A raises spending, with an assumed multiplier of zero point eight.
- Plan B cuts taxes, with an assumed multiplier of zero point five.
- Under plan A, output rises by zero point eight times twenty, which is sixteen billion crowns.
- As a share of G D P, sixteen over one thousand is one point six per cent.
- Under plan B, output rises by zero point five times twenty, which is ten billion crowns, or one per cent of G D P.
- Same cost to the budget, different effect on demand.

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6 How each policy reaches asset markets

Each policy's route into the markets

Market	Monetary policy	Fiscal policy
Bond yields	Expected policy rate path	Issuance volume, sovereign risk
Shares	Discount rate, wealth	Growth outlook
Currency	Interest rate gap	Inflation outlook, risk premium
Timing	Indirect, with lags	Direct on demand

IN THE LESSON

- Both policies also move asset markets, again through different routes.
- Take government bond yields first.
- Monetary policy moves them through the expected path of the policy rate.
- Fiscal policy moves them through the volume of bonds the government must issue, and the perceived risk that it may not repay, the sovereign risk.
- Next, shares.
- Monetary policy works through the discount rate, the rate used to value future profits, and through wealth.
- Fiscal policy works through the outlook for growth.
- Then the currency.
- Monetary policy works through the gap between home and foreign interest rates.
- Fiscal policy works through the inflation outlook and the risk premium on the country.
- Last, timing: monetary policy acts indirectly, with lags, and fiscal policy acts directly on demand.

7 The region of stability

- Region: the joint set of fiscal and monetary stances
- that keeps inflation anchored and debt sustainable
- Monetary: raise real rates when inflation rises
- Fiscal: adjust the primary balance to stabilise debt
- A joint condition, not two separate tests

IN THE LESSON

- Now the central idea.
- The region of stability is the set of fiscal and monetary stances that, taken together, keep inflation anchored and public debt sustainable.
- Anchored means people expect inflation to stay near the central bank's target, whatever happens this year.
- Sustainable means the debt can be serviced without default or a sudden squeeze.
- Two conditions mark the region.
- The monetary condition is that the central bank raises real interest rates when inflation rises.
- The fiscal condition is that the government adjusts its primary balance, its revenue minus its spending before interest, to stabilise the debt.
- And the key point: stability is a joint condition.
- Two policies that each look sound alone can still put the economy outside the region.

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8 The Taylor principle

Policy rate i = r* + π* + φ × (π − π*)
Taylor principle: φ > 1, so the real rate i − π rises

Policy rate i	The central bank's rate
Neutral real rate r*	Real rate, neither fast nor slow
Inflation target π*	The rate the bank aims for
Response φ	How hard the rate responds

IN THE LESSON

- The monetary condition is called the Taylor principle, and a simple Taylor style rule shows it.
- The policy rate, i, equals the neutral real rate plus the inflation target, plus a response, phi, times the gap between inflation and its target.
- The Taylor principle says phi must exceed one: the policy rate rises by more than one for one with inflation, so the real rate, the policy rate minus inflation, rises too.
- Now the four terms.
- The policy rate is the central bank's own rate.
- The neutral real rate, r star, is the real rate that neither speeds up nor slows down the economy.
- The inflation target, pi star, is the rate the central bank aims for.
- And phi is how hard the rate responds.

9 Example 2: Corvania's rate rule

Rule: i = 1% + 2% + φ × (π − 2%). Inflation jumps from the 2% target to 5%

Start: inflation on target	i = 1% + 2% = 3%	**real 1.0%**
Inflation 5%, φ = 1.5	1 + 2 + 1.5 × 3	**i = 7.5%**
Real rate with φ = 1.5	7.5% − 5%	**2.5%: tighter**
Inflation 5%, φ = 0.8	1 + 2 + 0.8 × 3	**i = 5.4%**
Real rate with φ = 0.8	5.4% − 5%	**0.4%: looser**

IN THE LESSON

- Corvania's neutral real rate is one per cent, its inflation target is two per cent, and inflation jumps to five.
- At the start, with inflation on target, the gap is zero and the policy rate is one plus two, three per cent, a real rate of one per cent.
- Now inflation is five.
- With a response of one point five, the rate is one plus two plus one point five times three, which is seven point five per cent.
- The real rate is seven point five minus five, two point five per cent, up from one.
- Policy has tightened.
- With a weak response of zero point eight, the rate is one plus two plus zero point eight times three, five point four per cent.
- The real rate is only zero point four per cent, down from one.
- The nominal rate rose, yet policy has eased.
- That is the classic mistake.

10 The fiscal condition

- Primary balance: revenue minus spending before interest
- Surplus: room to pay interest and cut debt
- When debt rises, raise the primary balance
- Enough to stop the debt ratio drifting up
- Never adjusting: someone else absorbs the cost

IN THE LESSON

- Now the fiscal condition.
- The primary balance is government revenue minus all spending except interest on the debt.
- A primary surplus means the government takes in more than it spends before interest, and can use the difference to pay interest and reduce debt.
- The fiscal condition says that when debt rises, the government must raise its primary balance enough to stop the debt ratio, debt as a share of G D P, from drifting up without limit.
- How much is enough depends on interest rates and growth, and we will work it out exactly in the last part of the lesson.
- If the government never adjusts, the debt snowballs, and sooner or later someone else, the central bank or bondholders, must absorb the cost.

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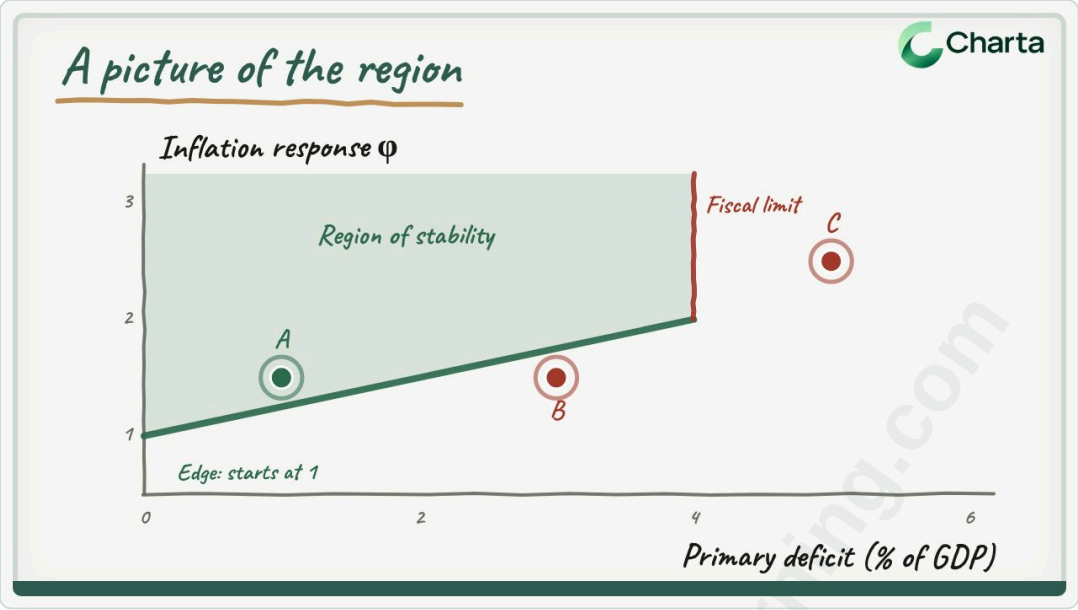
11 A picture of the region



IN THE LESSON

- Here is a stylised picture of the region.
- Along the bottom is the fiscal stance, the primary deficit as a share of G D P, from zero to six per cent.
- Up the side is the monetary stance, the inflation response phi.
- The green line is the lower edge of the region.
- With no deficit it starts at one, the Taylor principle.
- It slopes up, because a looser fiscal stance adds to demand and to inflation risk, so the central bank must respond harder.
- The red line is the fiscal limit, drawn at a deficit of four per cent.
- Beyond it, debt cannot be stabilised, and no monetary response can restore stability.
- The shaded area is the region of stability.
- Point A sits inside it.
- Point B has the same response as A but a bigger deficit, and falls below the edge.
- Point C lies beyond the fiscal limit.

12 Example 3: judging each policy alone

Stylised Corvania: response needed = 1 + 0.25 × deficit, for deficits up to 4% of GDP

Central bank alone: φ = 1.5	above 1: passes	**looks fine**
Deficit plan: 3% of GDP	1 + 0.25 × 3	**needs φ ≥ 1.75**
Joint test at φ = 1.5	1.5 < 1.75	**outside**
Deficit 5% of GDP	beyond the 4% limit	**no φ is enough**

IN THE LESSON

- Now put numbers on points B and C.
- In our stylised Corvania, the response needed is one plus zero point two five times the deficit, for deficits up to four per cent.
- The central bank uses a response of one point five.
- Judged alone, that is above one, so it passes the Taylor principle and looks fine.
- The ministry plans a deficit of three per cent, inside the four per cent limit, so alone it looks fine too.
- The response needed at that deficit is one plus zero point two five times three, one point seven five.
- Now the joint test.
- One point five is below one point seven five, so Corvania is outside the region, even though each side passed its own test.
- And if the deficit were five per cent, beyond the four per cent limit, no response would be enough.
- This is the classic mistake: judging each policy alone.

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13 The exam point for the two policies

- Monetary: indirect, through markets, with a lag
- Fiscal: direct on demand, sized by multipliers
- Region: joint set keeping inflation and debt in check
- Needs the Taylor principle and a responsive budget
- Looser fiscal needs tighter money, only up to a limit

IN THE LESSON

- So here is the exam point for this first part.
- Monetary policy works indirectly, through market rates, credit, asset prices and wealth, the exchange rate and expectations, and it acts with a lag.
- Fiscal policy acts directly on demand through spending, taxes and transfers, with the size set by multipliers.
- It reaches asset markets through bond issuance, the outlook for growth and inflation, and sovereign risk.
- The region of stability is the joint set of stances that keeps inflation anchored and debt sustainable.
- It needs the Taylor principle from the central bank and a responsive primary balance from the government.
- A looser fiscal stance needs more monetary tightening, but only up to a limit.

14 Outside the region: two failures

- Monetary too loose: expectations de-anchor
- Inflation persistent; currency weaker; long yields higher
- Fiscal unsustainable: debt outgrows the economy
- Risk premia and yields climb; bond-holding banks lose
- One failure can trigger the other

IN THE LESSON

- What happens outside the region?
- One of two failures appears, and often both.
- The first is monetary.
- If policy is too loose for the inflation pressure, expectations de-anchor: people stop believing inflation will return to target, so they build higher inflation into wages and prices, and inflation becomes persistent.
- The currency weakens, and long term bond yields rise, because lenders demand compensation for the inflation they now expect.
- The second failure is fiscal.
- If fiscal policy is unsustainable, debt rises faster than the economy can service it.
- Investors demand higher risk premia, so yields climb, and banks that hold government bonds suffer losses.
- And one failure can trigger the other.

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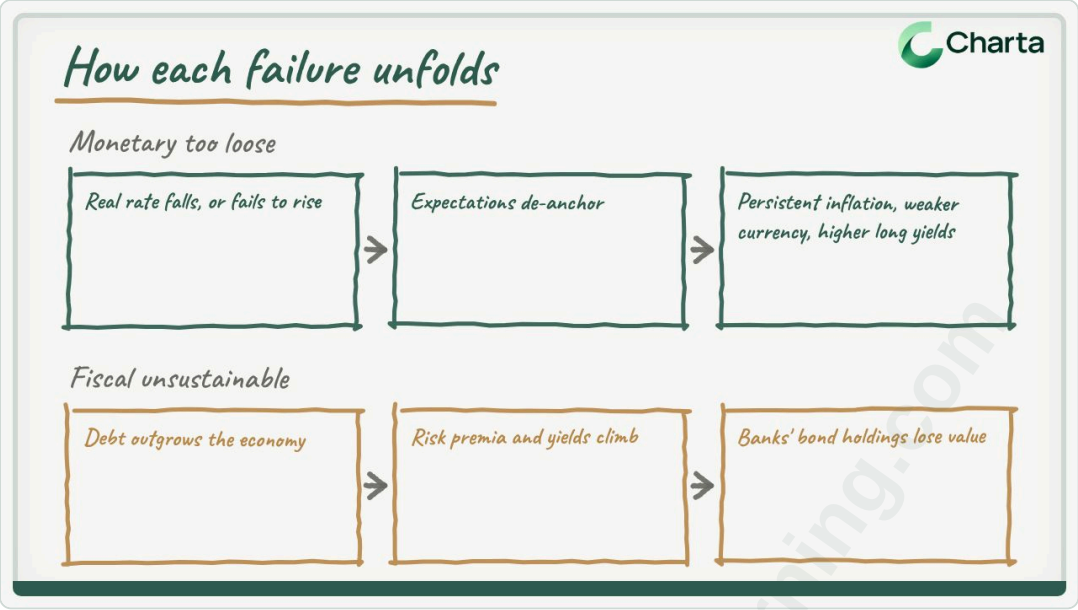
15 How each failure unfolds



IN THE LESSON

- Here are the two chains.
- The first row is monetary policy that is too loose.
- The real rate falls, or fails to rise, when inflation picks up.
- Expectations de-anchor, as people stop trusting the target.
- And the result is persistent inflation, a weaker currency and higher long term yields.
- The second row is fiscal policy that is unsustainable.
- Debt grows faster than the economy can carry.
- Investors demand higher risk premia, so yields climb, and every new bond costs more.
- And the banks holding government bonds see their value fall, which weakens their capital, the cushion that absorbs their losses.
- In the next two examples we put numbers on each chain.

16 Example 4: Corvania's long yield de-anchors

Corvania 10-year yield = real yield + expected inflation + inflation risk premium

Anchored: 1.0 + 2.0 + 0.5	expectations at target	**3.5%**
De-anchored: 1.0 + 5.0 + 1.5	expectations drift up	**7.5%**
Rise in the long yield	7.5 − 3.5	**+4.0 points**

IN THE LESSON

- Think of Corvania's ten year bond yield as three pieces: a real yield, plus expected inflation, plus an inflation risk premium, the extra lenders ask for being unsure about inflation.
- Anchored, the pieces are one per cent, plus two per cent, plus zero point five, because expectations sit at the target.
- That gives three point five per cent.
- Now policy stays too loose.
- De-anchored, the pieces are one, plus five, plus one point five, because expectations drift up to five per cent and the risk premium widens, as inflation is now harder to predict.
- That gives seven point five per cent.
- Seven point five minus three point five: the long yield has risen by four points, even though the real yield has not moved at all.

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17 Example 5: Kestrel Bank's bond losses

Kestrel Bank: 10bn crowns of Corvanian bonds, duration 6, capital 4bn. Yields rise 2 points

Price fall ≈ duration × rise	6 × 2 points	**12%**
Loss on the holding	12% × 10bn	**1.2bn**
Share of Kestrel's capital	1.2 ÷ 4	**30%**

IN THE LESSON

- Now the fiscal chain.
- Kestrel Bank holds ten billion crowns of Corvanian government bonds, with a duration of six, and it has four billion crowns of capital.
- Duration is the approximate percentage fall in a bond's price for each one point rise in its yield.
- As doubts about Corvania's debt grow, yields rise by two points.
- The price fall is about six times two, twelve per cent.
- The loss on the holding is twelve per cent of ten billion, one point two billion crowns.
- That is one point two over four, thirty per cent of Kestrel's capital lost, from the government's credit standing alone.

18 Three end games

If unsustainable debt is never fixed

End game	What happens	Who pays
Default	Debt not paid in full or on time	Bondholders
Financial repression	Rates held below inflation	Savers
Fiscal dominance	Central bank funds the state	All, via inflation

IN THE LESSON

- If nothing changes, unsustainable debt ends in one of three ways.
- The first is default.
- The government does not pay its debt in full or on time, and bondholders bear the loss.
- The second is financial repression.
- The state holds interest rates below inflation, and steers captive buyers, such as domestic banks and pension funds, into holding its bonds.
- Savers bear the cost, quietly, through negative real returns.
- The third is fiscal dominance.
- The central bank is pushed to finance the government, buying its debt and keeping rates low whatever inflation does.
- It gives up its inflation goal, and everyone bears the cost through inflation.

19 Example 6: financial repression in Corvania

Corvania caps its bond yield at 2% while inflation runs at 6%

Repaid after a year	100 × 1.02	**102**
In today's prices	102 ÷ 1.06	**96.2**
Real loss per 100 lent	100 − 96.2	**3.8**

IN THE LESSON

- Here is financial repression in numbers.
- Corvania caps the yield on its bonds at two per cent, and requires its banks to hold them, while inflation runs at six per cent.
- A saver who lends one hundred crowns is repaid one hundred times one point zero two, one hundred and two crowns, a year later.
- But prices have risen six per cent.
- In today's prices, one hundred and two divided by one point zero six is about ninety six point two.
- So the saver has lost about three point eight crowns of buying power on every hundred lent.
- The government's real debt burden has shrunk by the same amount.
- That is a hidden transfer from savers to the state, and it is why repression is called a quiet default.

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20 How the outcomes have shifted over time

The failures outside the region, then and now

	Advanced economies	Emerging markets
Past failure	High inflation, 1970s to early 1980s	Spirals, currency crises, defaults
Debt	In own currency	Often in foreign currency
What changed	Independent, credible central banks	Frameworks, flexible exchange rates
Result	Decades of low inflation	Many: local-currency debt

IN THE LESSON

- The outcomes outside the region have changed over time.
- Read the table row by row.
- The past failure: in advanced economies, high inflation in the nineteen seventies and early nineteen eighties.
- In emerging markets, inflation spirals, currency crises and defaults.
- Debt: advanced economies borrowed in their own currencies, while emerging markets often borrowed in foreign currency, typically dollars.
- What changed: advanced economies built independent, credible central banks.
- Many emerging markets built better policy frameworks, such as inflation targets, and moved to flexible exchange rates.
- The result: decades of low inflation in advanced economies, and in many emerging markets, deeper bond markets in their own currency, so more of their borrowing is now at home.
- Not all have improved.

21 Example 7: Corvania's old dollar debt

Earlier Corvania: debt 40% of GDP, all in dollars. A dollar now costs 50% more crowns

Dollar debt in crowns	40 × 1.5	**60% of GDP**
Rise in the debt ratio	60 − 40	**+20 points**
Same debt in crowns	the fall leaves it unchanged	**40% of GDP**

Assumes GDP in crowns is unchanged; a crisis usually cuts it too

IN THE LESSON

- Why does foreign currency debt matter so much?
- Go back to an earlier Corvania, whose public debt was forty per cent of G D P, all of it in dollars.
- In a currency crisis, the crown falls so far that a dollar costs fifty per cent more crowns.
- Measured in crowns, the dollar debt is now forty times one point five, sixty per cent of G D P.
- The debt ratio has jumped by twenty points overnight, without a single new crown borrowed.
- Had the same debt been in crowns, the fall would have left it at forty per cent.
- We assumed that G D P in crowns is unchanged; in a real crisis output usually falls too.

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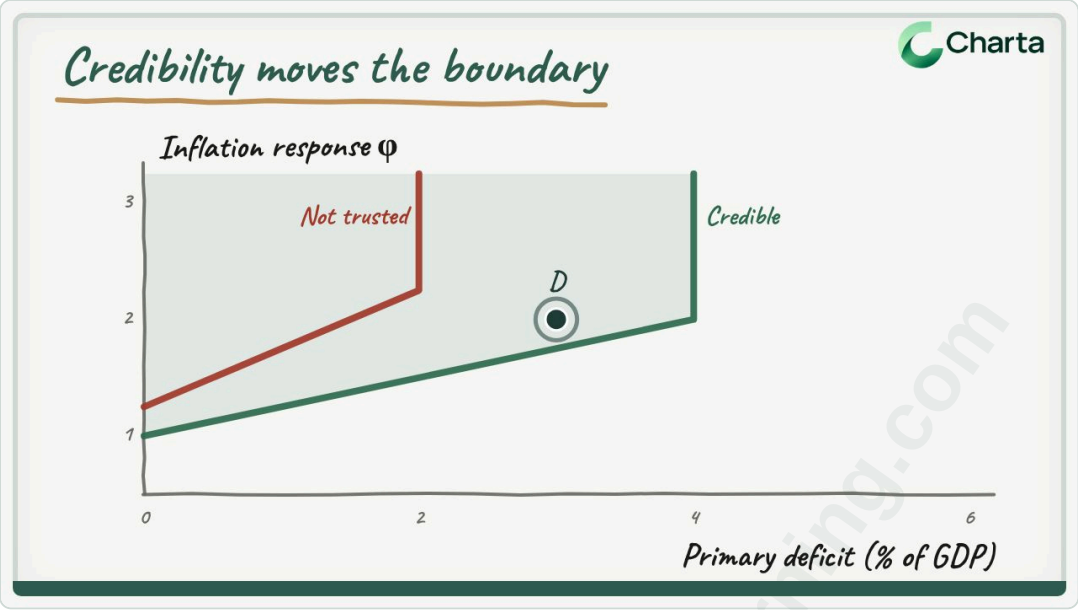
22 Credibility moves the boundary



IN THE LESSON

- Here is why credibility matters, as a stylised picture.
- The axes are the same as before: the primary deficit along the bottom, and the inflation response up the side.
- The green edge is the region for a credible Corvania, the one we drew earlier, with a fiscal limit at a deficit of four per cent.
- The red edge is the region for a Corvania whose institutions are not trusted.
- Because markets doubt both the central bank and the ministry, it must respond harder to inflation at every deficit, and its fiscal limit comes much sooner, at a deficit of two per cent.
- Point D, a deficit of three per cent with a response of two, is inside the credible region but outside the other.
- Same policies, different trust, different outcome.

23 The exam point: credibility moved the boundary

- Loose money: de-anchored expectations, persistent inflation
- Unsustainable debt: higher yields, losses at banks
- End game: default, repression or fiscal dominance
- Advanced and many emerging economies gained credibility
- Credibility moved the boundary, and it can move back

IN THE LESSON

- So here is the exam point for this part.
- Outside the region, policy fails in one of two ways, or both.
- Money that is too loose de-anchors expectations, giving persistent inflation, a weaker currency and higher long yields.
- Unsustainable debt raises risk premia and yields and hurts the banks that hold government bonds.
- The end game is default, financial repression or fiscal dominance.
- Over time, advanced economies moved from the high inflation of the nineteen seventies to decades of low inflation, and many emerging markets moved from crises and dollar debt to sturdier frameworks and local currency borrowing.
- In both cases, credibility moved the boundary of the region outward.
- And credibility can be lost, so the boundary can move back.

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24 Why high public debt is dangerous

- Shrinks fiscal space for the next crisis
- Ties the budget to interest rates
- Feeds a loop between the state and its banks
- Added pressure: ageing, defence, climate spending
- Can set fiscal and monetary policy against each other

IN THE LESSON

- Now the last part: the dangers of high public debt.
- First, it shrinks fiscal space, the room a government has to spend or cut taxes in a recession or a crisis without frightening its lenders.
- Second, it ties the budget to interest rates.
- The larger the debt, the more each rise in rates adds to the interest bill.
- Third, it feeds a loop between the state and its banks, which we will draw shortly.
- Fourth, other pressures are already adding to deficits in many countries: ageing populations, which raise pension and health spending, and higher spending on defence and on climate.
- And fifth, it can set fiscal and monetary policy against each other.

25 The arithmetic of debt

Next debt = debt × (1 + r) ÷ (1 + g) − primary balance
Steady-debt surplus = (r − g) ÷ (1 + g) × debt
Steady: d = d(1 + r) ÷ (1 + g) − pb, so pb = d(r − g) ÷ (1 + g)

Debt ratio	Debt as a share of GDP
Interest rate r	Average nominal rate paid
Growth g	Nominal GDP growth
Primary balance	Surplus before interest, % GDP

IN THE LESSON

- Debt follows a simple rule.
- Every term is a ratio to G D P, and r and g are written as decimals, so four per cent is zero point zero four.
- Next year's debt ratio equals this year's debt, times one plus r, divided by one plus g, minus the primary balance.
- Set next year's debt equal to this year's and solve, and you get the surplus that holds the ratio steady: r minus g, divided by one plus g, times the debt.
- Now the terms.
- The debt ratio is debt over G D P.
- The interest rate, r, is the average nominal rate the government pays on all its debt, not today's market rate.
- Growth, g, is nominal G D P growth, real growth plus inflation.
- The primary balance is the surplus before interest, as a share of G D P.
- When r is above g, a surplus is needed.
- When r is below g, the debt can stay steady even with a deficit.

26 Example 8: Corvania's debt when r is below g

Debt 100% of GDP, average rate r = 4%, nominal growth g = 5%, primary balance 0

Next year's debt	100 × 1.04 ÷ 1.05	**99.0%**
Steady-debt surplus	(0.04 − 0.05) ÷ 1.05 × 100	**−0.95%**
So a steady debt allows	a primary deficit of	**0.95% of GDP**

IN THE LESSON

- Corvania's debt is one hundred per cent of G D P.
- It pays an average rate of four per cent, nominal growth is five per cent, and its primary balance is zero.
- Next year's debt is one hundred times one point zero four divided by one point zero five, which is ninety nine point zero per cent.
- The debt ratio falls with no surplus at all, because the economy grows faster than the interest piles up.
- The surplus that holds the ratio steady is zero point zero four minus zero point zero five, divided by one point zero five, times one hundred: minus zero point nine five per cent.
- A negative surplus is a deficit.
- So Corvania could run a primary deficit of zero point nine five per cent of G D P, and its debt ratio would stay at one hundred.

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27 Example 9: the gap and the debt both matter

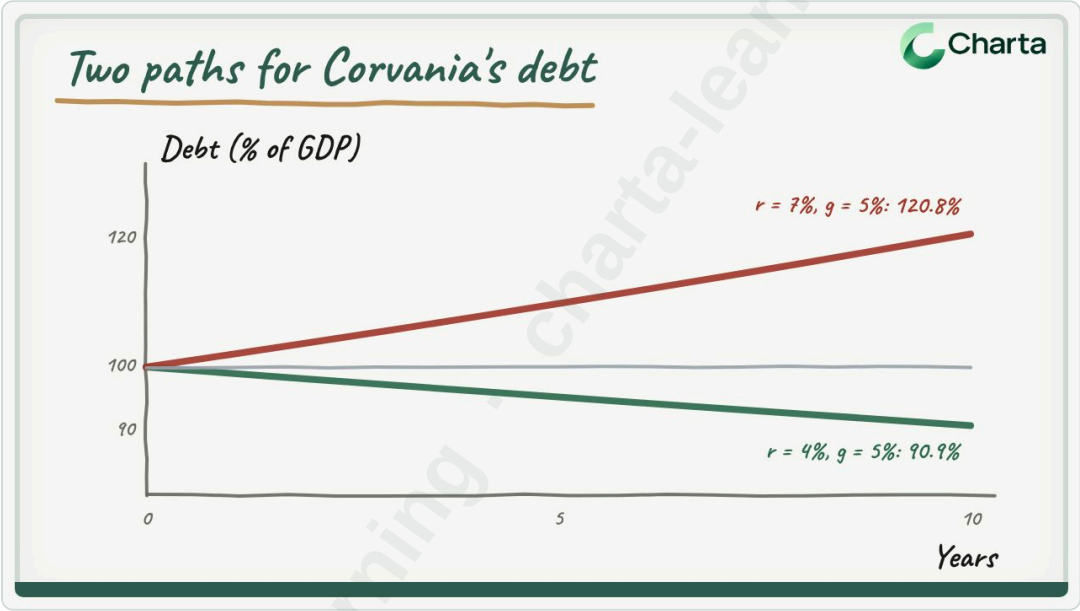
Steady-debt surplus, % of GDP, with g = 5%

Debt ratio	r − g = −1	r − g = +2
60%	−0.57%	+1.14%
100%	−0.95%	+1.90%
150%	−1.43%	+2.86%

IN THE LESSON

- Now let the rate rise above growth.
- The table shows the steady debt surplus for three debt ratios, with growth at five per cent, first with r at four, so r minus g is minus one point, then with r at seven, so r minus g is plus two points.
- At debt of sixty per cent, the surplus moves from minus zero point five seven to plus one point one four per cent of G D P.
- At one hundred per cent, from minus zero point nine five to plus one point nine zero.
- At one hundred and fifty per cent, from minus one point four three to plus two point eight six.
- The line below the table is the swing at one hundred and fifty per cent: two point eight six plus one point four three, which is four point two nine points of G D P, the largest of the three.

28 Two paths for Corvania's debt



IN THE LESSON

- Here are the two cases over ten years, with Corvania's primary balance held at zero.
- Along the bottom are the years, up the side the debt ratio.
- The grey line marks the starting debt of one hundred per cent.
- The green path has r of four and g of five.
- Each year the ratio shrinks a little, and after ten years it is about ninety point nine per cent.
- The red path has r of seven and g of five.
- Each year the ratio grows, and after ten years it is about one hundred and twenty point eight per cent.
- The only difference is whether interest outpaces growth.
- And a favourable gap, with r below g, is not permanent.
- It can turn, as rates rise.

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29 Example 10: higher rates arrive gradually

Debt 100% of GDP at an average 3%. Market rate jumps to 7%; a fifth refinances each year

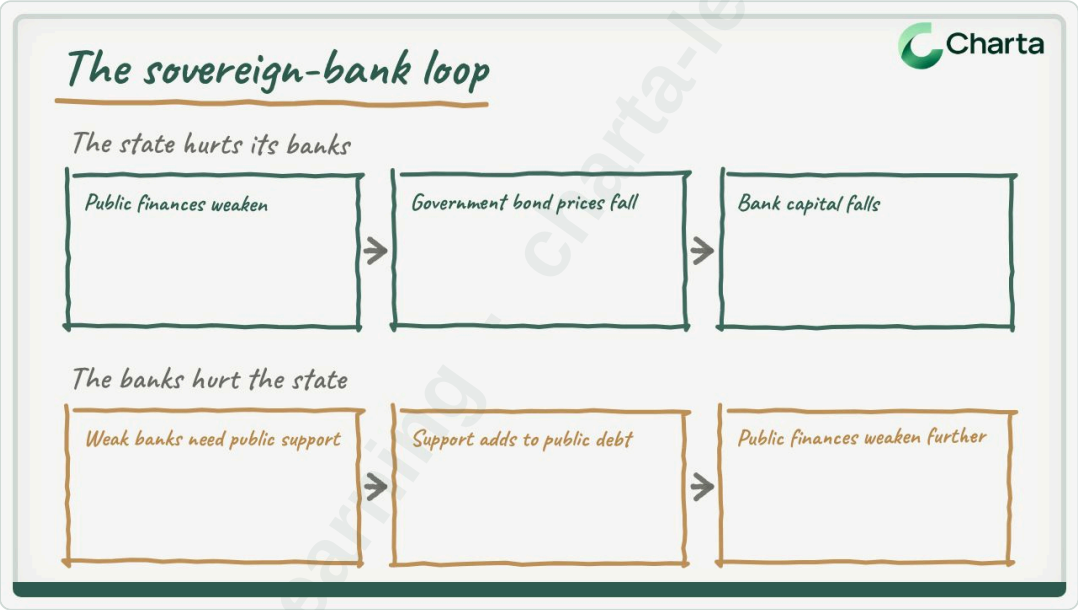
After 1 year	0.8 × 3% + 0.2 × 7%	**3.8%**
After 3 years	0.4 × 3% + 0.6 × 7%	**5.4%**
After 5 years: all refinanced	1.0 × 7%	**7.0%**
Interest bill on debt of 100%	from 3.0% of GDP	**7.0% of GDP**

Longer maturities slow the pass-through; they do not stop it

IN THE LESSON

- Higher market rates do not reach the budget at once.
- Corvania's debt of one hundred per cent of G D P pays an average of three per cent.
- Market rates jump to seven per cent, and each year a fifth of the debt matures and is refinanced at the new rate.
- After one year, the average rate is zero point eight times three plus zero point two times seven, three point eight per cent.
- After three years, zero point four times three plus zero point six times seven, five point four per cent.
- After five years, all the debt has been refinanced, so the average is seven per cent.
- On a debt of one hundred per cent, the interest bill climbs from three per cent of G D P to seven per cent of G D P, over five years, not overnight.
- Longer maturities slow this pass through, but they do not stop it.

30 The sovereign-bank loop



IN THE LESSON

- High debt also feeds a loop between the state and its banks.
- The first row shows how the state hurts the banks.
- Public finances weaken.
- The prices of government bonds fall, as in Kestrel's thirty per cent hit to capital.
- And bank capital falls, so banks lend less, which slows the economy.
- The second row shows how the banks hurt the state.
- Weak banks need public support, through guarantees or fresh capital from the government.
- That support adds to public debt.
- And public finances weaken further, which sends us back to the start of the first row.
- Each turn of the loop makes the next one worse.

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31 Example 11: when the two policies collide

Corvania: debt 120% of GDP. Rates rise 2 points; a quarter of debt refinances in year one

Extra interest, first year	120 × 25% × 2%	**0.6% of GDP**
Once all is refinanced	120 × 2%	**2.4% of GDP**
Same rise with debt of 60%	60 × 2%	**1.2% of GDP**

Wider deficit, more demand: markets doubt the central bank's resolve

IN THE LESSON

- Now the conflict.
- Inflation in Corvania demands a two point rise in interest rates, and Corvania's debt is one hundred and twenty per cent of G D P.
- In the first year, a quarter of the debt is refinanced, so the extra interest is one hundred and twenty times a quarter times two per cent, zero point six per cent of G D P.
- Once all the debt is refinanced, it is one hundred and twenty times two per cent, two point four per cent of G D P.
- With debt of only sixty per cent, the same tightening would cost, once refinanced, one point two per cent.
- If the ministry does not cut elsewhere, the deficit widens and adds to demand, working against the central bank.
- Markets then doubt that the central bank will keep rates high, and the two policies pull against each other.

32 Mistakes to avoid

- Judging each policy alone
- Reading a higher nominal rate as tighter policy
- Assuming tighter money can offset any fiscal stance
- Treating r below g as permanent
- Expecting higher rates to hit the budget at once, or never

IN THE LESSON

- Before the quiz, here are the mistakes to avoid.
- Do not judge each policy alone.
- Stability is a joint condition, and two policies that each look sound can still leave the economy outside the region.
- Do not read a rise in the nominal policy rate as tightening.
- What counts is the real rate, so the rate must rise by more than inflation rises.
- Do not assume a looser fiscal stance can always be offset by tighter money.
- That works only up to the fiscal limit.
- Do not treat r below g as permanent.
- The gap can turn, and with high debt the required surplus jumps.
- And do not expect higher rates to reach the budget overnight, or to never reach it.
- Refinancing passes them through gradually.

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33 Try three quick questions

1. Inflation rises 2 points; the policy rate rises 1.5 points. Has policy tightened?
   Answer: No: the real rate falls 0.5 points. Fails the Taylor principle.
2. Debt 80% of GDP, r = 6%, g = 4%. Which primary surplus holds the ratio steady?
   Answer: (0.06 − 0.04) ÷ 1.04 × 80 ≈ 1.54% of GDP.
3. Each policy passes its own test. Is the economy surely stable?
   Answer: Not necessarily: stability is a joint condition.

IN THE LESSON

- Try three quick questions, then listen to the answers.
- Question one.
- Inflation rises by two points, and the central bank raises its policy rate by one point five.
- Has policy tightened?
- No.
- The real rate falls by zero point five points, so the response fails the Taylor principle and policy has eased.
- Question two.
- Debt is eighty per cent of G D P, r is six per cent and g is four per cent.
- What primary surplus holds the debt ratio steady?
- Zero point zero six minus zero point zero four, divided by one point zero four, times eighty, which is about one point five four per cent of G D P.
- Question three.
- The central bank and the ministry each pass their own test.
- Is the economy surely stable?
- Not necessarily, because stability is a joint condition of both stances.

Summary notes for the Charta whiteboard lesson. Figures are from the lesson's made-up examples.

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