CHARTA LEARNING · LESSON NOTES

Yield curves, linkages and bond returns

Asset Allocation

1 A story: the curve as a forecast

- Yield curve: yields against time to maturity
- Short end follows the central bank's policy rate
- Long end: expected short rates plus term premium
- Heavy government borrowing can lift the premium

IN THE LESSON

- Imagine you ask a bank what it would pay to lock your savings away for a short time, and then for a long time.
- The answers differ, and the pattern of those answers across every length of lock is the yield curve.
- A yield curve plots the yield on government bonds against the time left until they mature.
- Its two ends have different owners.
- The short end follows the policy rate, the rate the central bank sets.
- The long end is built from two things: what the market expects the short rate to average over the bond's life, which includes expected inflation, and a reward for lending long, called the term premium.
- When a government borrows heavily, investors must absorb more bonds, and that premium tends to rise.

2 Splitting the long yield

Long yield = expected average short rate + term premium
Slope = long yield − policy rate

Long yield	Ten-year government yield
Expected short rate	Policy rate, averaged ahead
Term premium	Reward for lending long
Slope	Below zero means inverted

IN THE LESSON

- Here is the split as a formula.
- The long yield equals the expected average short rate plus the term premium.
- Notice what that means for the slope.
- Subtract the policy rate from the long yield: a positive answer is a steep curve, and a negative answer is an inverted one.
- But the slope can be pushed in two directions, and they are not equal in meaning.
- If the market expects short rates to fall, that is a forecast about the economy.
- If the term premium has been squeezed, perhaps because the central bank is buying bonds, a policy called quantitative easing, the slope falls without any forecast at all.
- So before you read a signal, always ask which part has moved.

3 Three shapes of the curve

Chart: Yield vs Time to maturity

- Steep: recovery
- Flat: slowing
- Inverted: warning

IN THE LESSON

- Now the picture.
- Along the bottom is the time until the bond matures, and up the side is the yield.
- First I draw a steep curve in green.
- Short yields are low and long yields are much higher.
- That is the shape of an economy expected to recover, with rates rising ahead.
- Next, in gold, a flat curve, where short and long yields are almost the same.
- The market sees growth slowing and little change in rates.
- Last, in red, an inverted curve, where short yields sit above long ones.
- The market expects the central bank to cut rates because the economy is weakening.
- Inversions have tended to come before recessions, which is why they get so much attention, but tended is not the same as always.

4 The policy mix and the curve

A heuristic, not a rule

Monetary and fiscal stance	Typical curve
Easy money, easy fiscal	Steep
Easy money, tight fiscal	Moderately steep
Tight money, easy fiscal	Flat
Tight money, tight fiscal	Inverted

IN THE LESSON

- Now bring in the government.
- Monetary policy, the central bank's stance, works mainly on the short end.
- Fiscal policy, the government's taxing and spending, works mainly on the long end through its borrowing.
- Read the table from top to bottom.
- Easy money and easy fiscal policy give low short rates and heavy borrowing, so the curve is steep.
- Easy money with tight fiscal policy keeps short rates low but borrows less, so the curve is only moderately steep.
- Tight money with easy fiscal policy gives high short rates against heavy borrowing, and the curve is flat.
- Tight money with tight fiscal policy gives high short rates, little borrowing and cuts expected ahead, so the curve inverts.
- Treat this as a textbook heuristic, not a law.

5 Example 1: Norra, a warning curve

Norra: policy rate 5.0%, deficit being cut

Expected average short rate		**3.8%**
Term premium		**+0.4%**
Ten-year yield	3.8 + 0.4	**4.2%**
Policy rate		**5.0%**
Slope	4.2 − 5.0	**−0.8**

IN THE LESSON

- Now a case.
- Dara is looking at Norra, a country with a policy rate of five per cent and a government that is cutting its deficit.
- That is tight money and tight fiscal policy.
- The market expects the policy rate to average three point eight per cent over the next ten years, and the term premium is zero point four per cent.
- Add them and the ten year yield is four point two per cent.
- Subtract the policy rate of five and the slope is minus zero point eight points.
- The curve is inverted, and the cause is expected cuts: the market is forecasting a slowdown.
- That fits the bottom corner of the table, and it is a signal worth acting on.

6 Example 2: Tarn, a false alarm

Tarn: policy rate 3.0%, central bank buying bonds

Expected average short rate	up from 3.0 today	**3.4%**
Term premium	squeezed by bond buying	**−0.7%**
Ten-year yield	3.4 − 0.7	**2.7%**
Policy rate		**3.0%**
Slope	2.7 − 3.0	**−0.3**

IN THE LESSON

- Compare Tarn.
- Its policy rate is three per cent, and its central bank has been buying bonds.
- Here the market expects the policy rate to average three point four per cent over ten years, which is above today's rate.
- So the market expects short rates to rise, the opposite of a slowdown forecast.
- But the bond buying has pushed the term premium down to minus zero point seven per cent.
- The ten year yield is three point four minus zero point seven, which is two point seven per cent.
- Against a policy rate of three, the slope is minus zero point three, and the curve is inverted.
- It has the same shape as Norra but a completely different message.
- Read mechanically, the slope would send you to the exit for the wrong reason.

7 Dara's call: Norra and Tarn

- Norra: trim cyclical equity risk, add duration
- Why: tight and tight, inversion from expected cuts
- Tarn: keep equity; inversion is a squeezed premium
- Risk: a signal can be wrong, so move in steps

IN THE LESSON

- So what does Dara recommend to the Wren Valley Pension Fund?
- On Norra, tight money and tight fiscal policy, together with an inversion explained by expected cuts, point to weaker growth.
- She proposes trimming cyclical equity risk and adding bond duration, because bond prices rise when yields fall.
- On Tarn she keeps the equity weight, because the inversion comes from the term premium, and the market expects rates to rise.
- What could go wrong?
- Curves can invert and no recession follow, so she may sell equities too early.
- That is why she moves in steps and watches the next data.
- The trap in the exam is treating the slope, or the policy table, as a mechanical rule.

8 A story: the pond and the ripples

- Growth travels through trade and profits abroad
- A current account deficit needs capital inflows
- Pegs tie local rates to the anchor country's rates
- Bond yields in open markets tend to move together

IN THE LESSON

- Throw a stone into a pond and the ripples reach every shore.
- Economies work like that.
- A country that sells a lot to a partner imports the partner's cycle: when the partner slows, its orders fall.
- Money moves too.
- A country that buys more abroad than it sells runs a current account deficit, and the gap must be paid for by capital inflows from foreign investors.
- Interest rates are linked, because investors send money wherever it is best rewarded, and some countries fix their currency to a stronger one, called a peg, which ties their rates to the anchor country's.
- Dara has been asked about Pellan, a small open economy whose currency, the pellar, is pegged to the fund's home currency.

9 Two chains of cause and effect

Growth link

Partner slows → Exports fall → Reserves fall → Peg under pressure

Financing link

Deficit widens → Needs inflows → Inflows stall → Yields rise

IN THE LESSON

- This picture shows two chains.
- Read the top row from left to right.
- A partner slows, so Pellan's exports fall.
- Fewer export earnings mean fewer foreign currency coming in, so reserves fall and the peg comes under pressure.
- Now the bottom row.
- A current account deficit widens, so Pellan needs more inflows to pay for it.
- If those inflows stall, because investors lose confidence, the currency comes under pressure, and yields have to rise to tempt money back.
- Notice that every box depends on another country.
- That is the point of the picture: growth, rates and currency are three views of the same connection.

10 Example 3: how big is the ripple?

Pellan, a small open economy: GDP 200bn pellars

Exports, 40% of GDP	40% × 200	**80bn**
Sold to the partner	half of 80	**40bn**
Partner demand falls 5%	5% × 40	**−2.0bn**
Direct hit to GDP	2.0 ÷ 200	**1.0%**
Deficit, 5% of GDP	5% × 200	**10bn to fund**

Direct, first-round effect only

IN THE LESSON

- Let us put sizes on both chains.
- Pellan has G D P of two hundred billion pellars.
- Its exports are forty per cent of G D P, which is eighty billion.
- Half of that, forty billion, is sold to its main partner.
- Suppose the partner's demand falls five per cent.
- Five per cent of forty is a loss of two billion in exports, and two over two hundred is one per cent of G D P.
- That is only the direct, first round effect, before jobs and spending respond.
- Now the second chain.
- Pellan runs a current account deficit of five per cent of G D P, which is ten billion that foreign investors must supply.
- A slowdown would hit growth while that financing need stays put.

11 Example 4: what a pegged rate is made of

Pellan's one-year rate under a peg

Anchor (home) rate		**3.0%**
Normal peg premium		**+1.0%**
Fragility premium	reserves falling	**+2.0%**
Pellan one-year rate		**6.0%**

IN THE LESSON

- Now the interest rate link.
- Under a peg, the central bank cannot set rates freely, because rates must follow the anchor country's, or money flows out and the peg breaks.
- Pellan's anchor is the fund's home currency, with a one year rate of three per cent.
- On top of that, investors ask a normal premium of one point, because any peg can fail one day.
- But Pellan's reserves have been falling, so the market now asks an extra two points, a fragility premium.
- The one year Pellan rate is three plus one plus two, which is six per cent.
- That high yield is not free money.
- It is pay for the risk that the peg breaks.

12 Covered interest parity

Forward = spot × (1 + local rate) ÷ (1 + home rate)

Spot rate	Pellars per home unit today
Forward rate	Rate locked in for one year
Local rate	Pellan one-year rate
Home rate	The fund's one-year rate

IN THE LESSON

- Now the currency link.
- Covered interest parity says that if you can lock in an exchange rate for next year, called a forward rate, then nobody can earn a free profit from the gap between two countries' interest rates.
- So the forward rate must equal the spot rate, today's rate, times one plus the local rate, divided by one plus the home rate.
- Here rates are quoted as pellars per home unit, so a higher forward number means a cheaper pellar.
- The country with the higher interest rate always trades at a forward discount, which is the exchange rate taking back the extra yield.
- The result is simple: once the currency is hedged, a higher yield abroad is no free lunch.

13 Example 5: hedge or not?

Spot 4.00 pellars per home unit; local 6.0%, home 3.0%

Forward rate	4.00 × 1.06 ÷ 1.03	**4.1165**
Hedged return	removes the yield gap	**3.0%**
Unhedged, peg holds		**6.0%**
Peg breaks to 4.80	1 − 4.00 ÷ 4.80	**−16.7%**
Unhedged return then	1.06 × 4.00 ÷ 4.80 − 1	**−11.7%**

Extra 3.0 points vanish if the pellar falls just 2.8%

IN THE LESSON

- Now Dara's choice.
- The spot rate is four pellars per home unit.
- The forward rate is four times one point zero six, divided by one point zero three, which is about four point one one six five.
- If she hedges, the extra yield is eaten by the forward rate, and the return is exactly the home rate, three per cent.
- If she does not hedge and the peg holds, she earns the full six per cent.
- But suppose the peg breaks and the rate moves to four point eight.
- The pellar loses sixteen point seven per cent of its value, and the return becomes one point zero six times four, over four point eight, minus one: minus eleven point seven per cent.
- The break even is small: the pellar need only fall two point eight per cent to wipe out the extra yield.
- So she proposes to hedge, or hold only a small unhedged slice.

14 What moves a currency and a yield

Pressures, not rules

Driver	Typical effect
Higher real rates or faster growth	Currency up
Risk appetite falls	Safe havens up
Bigger current account deficit	Currency down
Anchor country yields rise	Local yields follow

IN THE LESSON

- What else decides the spot rate, the exchange rate today?
- Think of four drivers.
- Higher real interest rates at home, meaning rates after inflation, or faster growth than partners, attract capital, so the currency tends to rise.
- When risk appetite falls, money runs to safe currencies, and emerging currencies fall.
- A larger current account deficit means more borrowing from abroad, and the currency tends to fall.
- And in open markets bond yields move together, so when the anchor country's yields rise, local yields follow.
- None of these is a rule, but together they tell Dara which way the pressure points.

15 Mistakes to avoid so far

- Reading the slope without splitting the yield
- Treating the policy mix as a rule
- Analysing one country in isolation
- Assuming a peg removes currency risk
- Forgetting that hedging closes the yield gap

IN THE LESSON

- Here are the mistakes to avoid so far.
- One, reading the slope alone.
- Always split the long yield into expected short rates and the term premium first.
- Two, treating the policy mix table as a rule.
- It is a heuristic, and bond buying can flatten a curve with no recession ahead.
- Three, analysing a country in isolation, when its growth, its funding and its currency depend on its partners.
- Four, assuming a peg removes currency risk.
- The peg is a promise that can be broken, and the extra yield is the price of that risk.
- Five, forgetting that hedging closes the yield gap, so the extra yield exists only if you carry the currency risk.

16 Three ways to estimate a bond's return

- Discounted cash flow: start from yield, then adjust
- Building blocks: a premium for each risk
- Equilibrium model: premiums from risk and the market
- Choose by horizon and by the question asked

IN THE LESSON

- A friend says her bond yields a lot, so that is what it will earn.
- Is she right?
- Sometimes.
- There are three ways to estimate what a bond will earn, and part of the skill is knowing which one fits.
- The first starts with the yield to maturity, the return promised if you hold to the end and every coupon is paid, then adjusts it for what you expect to happen.
- This is the discounted cash flow approach.
- The second builds the return from blocks: a safe short rate plus a reward for each extra risk.
- The third, an equilibrium model, derives the rewards from how risky the asset is and what the world pays for risk.
- Use the first for a horizon of a few years, the second for a long term view, and the third when yield data is poor.

17 Why yield works, and when

Chart: Size of effect of a yield rise vs Investment horizon (years)

- Price loss
- Reinvestment gain
- They offset at duration

IN THE LESSON

- Why does the yield work as a forecast only sometimes?
- Here is the reason.
- Macaulay duration is the weighted average time until you receive a bond's cash flows.
- Along the bottom is your investment horizon, and up the side is the size of the effect of a rise in yields.
- I draw the red line first: the price loss from a rise in yields.
- It is large for a short horizon, because you sell while the bond still has a long life and a big price swing, and it shrinks as the horizon lengthens.
- Now the green line: the reinvestment gain, because you reinvest coupons at the higher rates.
- It grows with every year.
- Where the lines cross, the horizon equals the Macaulay duration and the two effects offset.
- There, the yield is a fair estimate.

18 The discounted cash flow estimate

Return ≈ yield + rolldown − (modified duration × yield change)
− probability of default × loss given default

Yield to maturity	The promised starting point
Rolldown	Gain from ageing on the curve
Price effect	Duration × expected yield rise
Credit loss	Default probability × loss

IN THE LESSON

- So the discounted cash flow estimate is a short list.
- Start with the yield to maturity.
- Add rolldown, the gain as a bond ages along an upward sloping curve: next year it is a shorter bond, shorter bonds yield less, so its price rises.
- Then adjust for any change in yield you expect, using modified duration, which measures the price change for each point of yield.
- A rise in yield lowers the price, so that term is subtracted.
- Finally take away expected credit losses, which are the probability of default times the loss given default.
- The yield is a promise, and the credit loss is the expected broken part of it.
- Use the yield alone only when your horizon is close to the Macaulay duration and you expect no change.

19 Example 6: a triple B bond over one year

Yield 5.4%, rolldown 0.3%, modified duration 5.5, default 1%, loss 50%

Yield to maturity		**5.4%**
Rolldown		**+0.3%**
Yield rises 0.25 points	−5.5 × 0.25	**−1.375%**
Expected credit loss	1.0% × 50%	**−0.5%**
One-year expected return	5.4 + 0.3 − 1.375 − 0.5	**3.825%**

IN THE LESSON

- Dara tests the formula on a triple B corporate bond.
- Its yield to maturity is five point four per cent, and rolldown adds zero point three.
- She expects yields to rise by zero point two five points, and the modified duration is five point five, so the price effect is minus five point five times zero point two five, which is minus one point three seven five per cent.
- The probability of default is one per cent a year and the loss given default is fifty per cent, so the expected credit loss is zero point five.
- Add it up: five point four plus zero point three, minus one point three seven five, minus zero point five, which is three point eight two five per cent.
- The yield alone would have said five point four.
- For a one year horizon that overstates the answer by a wide margin.

20 The building block estimate

Return = real short rate + expected inflation + term + credit + liquidity premiums

Real short rate	Safe short bond, after inflation
Expected inflation	Gives the nominal short rate
Term premium	For lending longer
Credit premium	For the risk of default
Liquidity premium	For hard-to-sell bonds

IN THE LESSON

- Now the building block approach.
- Start with the real short term rate, the return on a safe short bond after inflation.
- Add expected inflation and you have the nominal short term rate.
- Then add a reward for each extra risk.
- The term premium pays for lending for longer.
- The credit premium pays for the chance that the borrower does not repay.
- The liquidity premium pays for bonds that are hard to sell quickly.
- The trap is double counting inflation.
- If a question gives you a nominal short rate, it already contains inflation, so do not add inflation again.
- And these premiums are not constants.
- They change with the cycle and with today's spreads, so you estimate each one from current conditions.

21 Example 7: building the index return

Wren Valley corporate bond index

Nominal short-term rate	0.8 + 2.0	**2.8%**
Term premium		**+0.9%**
Credit premium		**+1.2%**
Liquidity premium		**+0.4%**
Expected return		**5.3%**

IN THE LESSON

- Here are Dara's building blocks for the Wren Valley corporate bond index.
- The real short rate is zero point eight per cent and expected inflation is two, so the nominal short rate is two point eight.
- The term premium is zero point nine, the credit premium one point two and the liquidity premium zero point four.
- Adding the lot gives five point three per cent.
- More than half of it is the safe short rate, and the rest is pay for risks.
- This is the long run expected return she would put into the strategic plan.
- Notice that the inflation was counted once, inside the nominal short rate, and not a second time on top.

22 Premiums move with the cycle

Credit premium (%)

Boom	**0.7%**
Normal	**1.2%**
Slowdown	**2.2%**
Crisis	**3.5%**

Illustrative: the premium follows the cycle

IN THE LESSON

- Those premiums are not fixed numbers.
- This picture shows an illustrative credit premium at four points of the economic cycle.
- In a boom, borrowers look safe, and the premium is only zero point seven per cent.
- In a normal year it is one point two, the figure Dara used.
- In a slowdown it widens to two point two, and in a crisis to three point five.
- So when you estimate a building block, ask where the cycle is today, and look at current spreads.
- A premium taken from a long run average can be far too low in a crisis, or too high in a boom.
- The same goes for the term premium, which moves with uncertainty about inflation and rates.

23 Equilibrium premium: Singer-Terhaar

Risk premium = global Sharpe ratio × volatility × correlation

Global Sharpe ratio	Reward per unit of risk
Volatility	The asset's own risk
Correlation	With the global market
Risk premium	Added to the default-free rate

IN THE LESSON

- The third method asks a different question: how much should an asset pay, given the risk it carries and the price the whole world charges for risk?
- That is the Singer Terhaar idea.
- The global market has a Sharpe ratio, its reward for each unit of risk.
- An asset's premium is that Sharpe ratio times its own volatility, times its correlation with the global market.
- Why correlation?
- In a fully integrated market, investors hold the world portfolio and are paid only for risk that cannot be diversified away, which is measured by correlation.
- In a fully segmented market, closed off from world capital, local investors price the asset on its total risk, so you treat the correlation as perfect.
- Real markets sit between the two.

24 Example 8: an emerging market premium

Emerging market bonds: volatility 8%, global Sharpe ratio 0.30

Price of risk	global Sharpe ratio	**0.30**
Volatility of the bonds		**8%**
Integrated: correlation 0.5	0.30 × 8 × 0.5	**1.2%**
Segmented: correlation 1.0	0.30 × 8 × 1.0	**2.4%**

IN THE LESSON

- Now a number.
- An emerging market bond has volatility of eight per cent.
- The global Sharpe ratio is zero point three.
- If the bond market is fully integrated with the world and has a correlation of zero point five with it, the premium is zero point three times eight times zero point five, which is one point two per cent.
- If the market is fully segmented, you treat the correlation as one, and the premium is zero point three times eight times one, or two point four per cent.
- Real markets sit between the two.
- Add the premium to the default free rate to get an expected return.
- As always, these inputs are estimates, so Dara shows both answers and does not pretend to precision.

25 Why emerging market bonds differ

- Weaker legal systems and creditor rights
- Political instability, commodity dependence
- Capital flight when confidence falls
- Currency mismatch: debts owed in foreign currency

IN THE LESSON

- Now to emerging market bonds.
- A farmer borrows in a foreign currency because the interest is cheap.
- Then his own currency falls, and each repayment costs more of his harvest.
- That story contains most of what is different about emerging market debt.
- Beyond the credit spread, investors face weaker legal systems and creditor rights, so recovering money after a default is harder.
- They face political instability, dependence on commodity exports whose prices swing, and capital flight, when foreign investors pull money out together.
- And they face currency mismatch, where a government earns in its own currency but owes in a foreign one.
- A high spread pays for these risks, but country risk analysis must tell you whether it pays enough.

26 Ability and willingness to pay

Ability to pay

Fiscal balance → Debt burden → Current account → Reserves

Willingness to pay

Politics → Institutions → Creditor rights

IN THE LESSON

- Country risk analysis asks two questions, drawn here as two rows.
- The first row is ability to pay.
- Read it from left to right.
- The fiscal balance asks whether the government spends more than it raises.
- The debt burden asks how large the debts are, at home and abroad.
- The current account asks how much the country must borrow from other countries.
- And reserves, the foreign currency the central bank holds, are the buffer if foreign money leaves.
- The second row is willingness to pay, which no formula gives.
- Politics asks whether the government is stable.
- Institutions asks about courts and a credible central bank.
- Creditor rights asks whether claims can be enforced.
- A government that can pay may still choose not to.

27 The curriculum's rules of thumb

Screening rules, not tests of distress

Indicator	Concern when
Fiscal deficit	above 4% of GDP
Public debt	above 70% to 80% of GDP
Current account deficit	above 4% of GDP
Reserves	below 100% of short-term debt

IN THE LESSON

- These are the curriculum's rules of thumb, and the table lists them.
- Worry about a fiscal deficit above about four per cent of G D P.
- Worry about public debt above seventy to eighty per cent of G D P.
- Worry about a current account deficit above about four per cent of G D P.
- And worry when reserves cover less than one hundred per cent of short term foreign debt, the debt due within a year.
- These are screens.
- They tell you where to look harder, not who will default, because sustainability also depends on the currency the debt is in, how long it runs, growth, access to markets and the quality of institutions.

28 Example 9: screening Merrova

Merrova, in billions: GDP 500, short-term foreign debt 60

Fiscal deficit	15 ÷ 500, no flag	**3.0%**
Public debt	330 ÷ 500, no flag	**66%**
Current account deficit	27.5 ÷ 500, flag	**5.5%**
Reserve cover	36 ÷ 60, flag	**60%**

IN THE LESSON

- Apply the screens to Merrova.
- In billions, G D P is five hundred.
- The fiscal deficit is fifteen, which is three per cent of G D P, and that raises no flag.
- Public debt is three hundred and thirty, which is sixty six per cent, no flag either.
- The current account deficit is twenty seven point five, which is five point five per cent, and that is above its screen, a flag.
- Reserves are thirty six against sixty of short term foreign debt, which is sixty per cent cover, below full cover, another flag.
- Two of the four screens are flagged.
- The debt ratio alone would have told a comfortable story, which is exactly why one ratio is never enough.

29 Example 10: the currency mismatch

Merrova: 70% of the 330bn public debt is in foreign currency

Debt in foreign currency	70% × 330	**231bn**
After a 20% currency fall	231 ÷ 0.80	**288.75bn**
Debt in local currency	330 − 231	**99bn**
New public debt	99 + 288.75	**387.75bn**
As a share of GDP	387.75 ÷ 500	**77.6%**

Was 66% of GDP; GDP assumed unchanged

IN THE LESSON

- Now the currency mismatch.
- Seventy per cent of Merrova's public debt of three hundred and thirty billion is owed in foreign currency, which is two hundred and thirty one billion.
- Suppose its currency falls twenty per cent.
- Each local unit now buys zero point eight of what it did, so the foreign currency debt costs two hundred and thirty one divided by zero point eight, which is two hundred and eighty eight point seven five billion.
- The remaining ninety nine billion is in local currency and does not change.
- The new total is three hundred and eighty seven point seven five billion, which is seventy seven point six per cent of G D P.
- Before the fall the ratio was sixty six per cent.
- One currency move has taken a ratio that looked safe into the danger range, assuming G D P is unchanged in local terms.

30 Dara's call: Merrova

- Two flags and heavy foreign currency debt: small position
- Hard currency bonds only, and only if the spread pays
- No local currency bonds: a managed rate is not safe
- Review triggers: reserves, the vote, the currency

IN THE LESSON

- So what does Dara propose for Merrova?
- Two screens are flagged, much of the debt is in foreign currency, and the currency move we just saw would push the debt ratio into the danger range.
- She proposes a small position at most, in hard currency bonds only, and only if the spread pays for the risk.
- She avoids Merrova's local currency bonds, because a managed currency is no safety.
- Then there is the half no ratio captures.
- A vote is due soon, and she doubts the courts would help creditors.
- What could go wrong?
- The spread may be tighter than the risk, or the reserves may be rebuilt.
- So she sets triggers to review: reserves, the vote and the currency.
- The trap is judging a sovereign by ratios alone.

31 Recap: the lesson in five lines

- Slope: split the long yield, then read the policy mix
- Links: growth, rates, currency; a peg is not safety
- Return: yield, building blocks or equilibrium
- Match the method to the horizon and the duration
- Emerging debt: ratios first, then willingness to pay

IN THE LESSON

- Let us pull the lesson together.
- First, the slope of the curve is a signal, but split the long yield into expected short rates and the term premium before you read it, and treat the policy mix table as a heuristic.
- Second, economies are linked through growth, funding, rates and currencies, and a peg is a promise, not safety.
- Hedging brings a foreign return back to the home rate.
- Third, expected return on a bond can come from the yield with adjustments, from building blocks, or from an equilibrium model.
- Fourth, match the method to the horizon and the duration.
- Fifth, for emerging market debt use the ratios as screens, and then judge willingness to pay and the quality of institutions.

32 Try three quick questions

1. Expected average short rate 3.0%, term premium 0.5%, policy rate 4.0%. Slope?
   Answer: Long yield 3.5%; slope 3.5 − 4.0 = −0.5: inverted.
2. Real rate 1.0%, inflation 2.0%, term 0.7%, credit 0.9%, liquidity 0.2%. Return?
   Answer: 1.0 + 2.0 + 0.7 + 0.9 + 0.2 = 4.8%.
3. Reserves 45bn, short-term foreign debt 90bn. Cover?
   Answer: 45 ÷ 90 = 50%: a flag to investigate, not proof.

IN THE LESSON

- Now try three questions yourself.
- Question one.
- The market expects the policy rate to average three per cent, the term premium is zero point five per cent, and the policy rate today is four per cent.
- What is the slope?
- The long yield is three point five, so the slope is minus zero point five points, and the curve is inverted.
- Question two.
- The real short rate is one per cent, expected inflation is two, the term premium is zero point seven, the credit premium zero point nine and the liquidity premium zero point two.
- What is the expected return?
- One plus two plus zero point seven plus zero point nine plus zero point two is four point eight per cent.
- Question three.
- Reserves are forty five billion and short term foreign debt is ninety billion.
- What is the cover?
- forty five over ninety is fifty per cent.
- That is below full cover, so it is a flag, but it is a flag to investigate and not proof of trouble.