CHARTA LEARNING · LESSON NOTES

Liquidity Transfer Pricing

FRM Part II

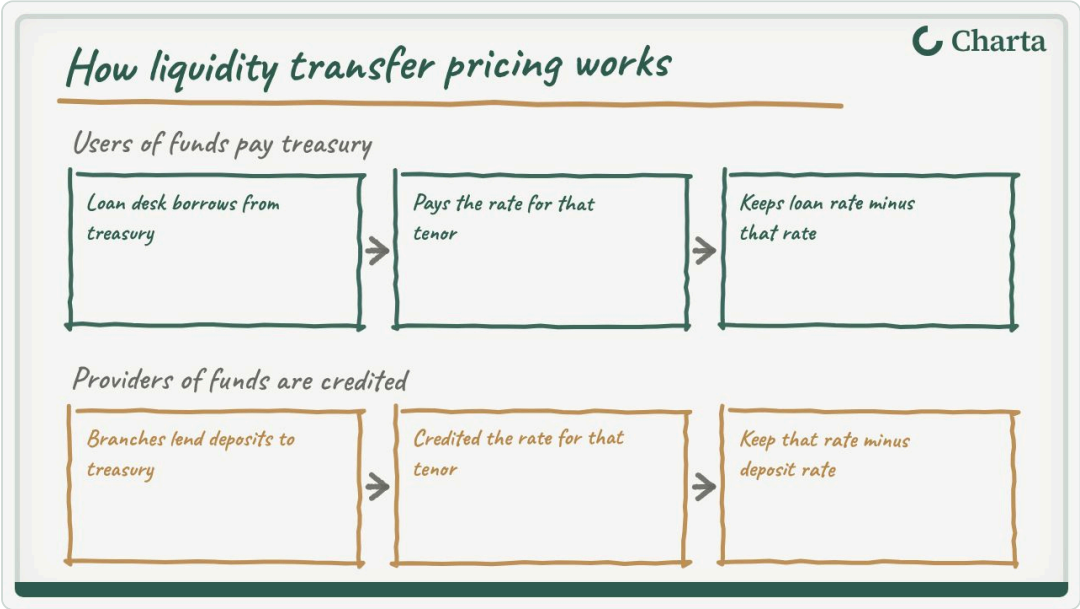
1 A story: who really earned the profit?

- Halden: branches gather deposits; a desk makes loans
- Loan desk claims the whole loan-deposit gap
- Branches show only cost: they look like a loss maker
- Five-year loans on short deposits: risk sits with no one
- Answer: an internal price for funds, set by treasury

IN THE LESSON

- Imagine Halden Bank.
- Its branches gather deposits from savers, and its corporate desk makes loans to companies.
- At the year end, the board asks a simple question: which part of the bank made money?
- The loan desk claims the whole gap between the loan rate and the deposit rate.
- The branches show only the interest they pay out, so they look like a loss maker, even though they bring in the funds that everyone uses.
- Worse, the desk makes five year loans funded by deposits that could leave tomorrow, and that liquidity risk sits with no one.
- The answer is an internal price for funds, set by the bank's treasury.
- That is what liquidity transfer pricing provides.

2 How liquidity transfer pricing works



IN THE LESSON

- Liquidity transfer pricing is the internal mechanism by which a bank's treasury charges the business lines that use funds, and credits the business lines that provide them.
- Look at the first row, the users of funds, who pay treasury.
- The loan desk in effect borrows from treasury.
- It pays the internal rate for that tenor, meaning the length of time the money is tied up.
- And it keeps the loan rate minus that internal rate.
- Now the second row, the providers of funds, who are credited.
- The branches in effect lend their deposits to treasury.
- They are credited the internal rate for that tenor.
- And they keep that rate minus the rate they pay depositors.
- Treasury sits in the middle and manages the bank's overall funding.

3 The internal price and the margins

FTP rate = base rate + liquidity premium
Loan margin = loan rate − FTP rate

FTP rate	Treasury's internal price
Base rate	Pure interest rate, same tenor
Liquidity premium	Term funding cost, by currency
Business margin	loan − FTP, or FTP − deposit rate

IN THE LESSON

- The internal rate is often called the funds transfer pricing rate, or F T P rate.
- It has two parts.
- The base rate is the pure interest rate for the same tenor, the price of money with no liquidity cost specific to the bank.
- The liquidity premium is the extra the bank pays to borrow for longer, because term funding is scarcer and costlier than overnight money.
- It differs by tenor and by currency.
- The business margin is what the business line keeps.
- For a loan it is the loan rate minus the F T P rate.
- For a deposit it is the F T P rate minus the deposit rate.
- The aim is that each unit's profit reflects the liquidity it consumes or supplies.

4 Halden's funding curve

Halden's own curve, US dollars. FTP rate = base 3.00% + liquidity premium

Tenor	Base rate	Liquidity premium	FTP rate
Overnight	3.00%	0.00%	3.00%
1 year	3.00%	0.20%	3.20%
2 years	3.00%	0.40%	3.40%
3 years	3.00%	0.60%	3.60%
5 years	3.00%	0.80%	3.80%

IN THE LESSON

- Here is Halden's own funding curve in U S dollars.
- To keep the arithmetic clear, we assume the base rate is three per cent at every tenor, so all the differences come from the liquidity premium.
- Overnight money carries no liquidity premium, so its F T P rate is three per cent.
- One year funds carry zero point two per cent, so the rate is three point two per cent.
- Two years carry zero point four, giving three point four.
- Three years carry zero point six, giving three point six.
- Five years carry zero point eight, giving three point eight per cent.
- The premium rises with tenor, because locking in funds for longer costs the bank more.
- Every later example in this lesson uses this curve.

5 Example 1: one margin split three ways

Desk lends $100m for 5 years at 5.5%. Branches raise $100m 2-year at 3.1%

Loan desk: 5.5% − 3.8%	on $100m	**1.7% = $1.7m**
Branches: 3.4% − 3.1%	on $100m	**0.3% = $0.3m**
Treasury: 3.8% − 3.4%	keeps the mismatch	**0.4% = $0.4m**
Bank: 5.5% − 3.1%	1.7 + 0.3 + 0.4	**2.4% = $2.4m**

IN THE LESSON

- The desk lends one hundred million dollars for five years at five point five per cent, and the branches raise one hundred million dollars of two year term deposits at three point one per cent.
- The loan desk pays the five year F T P rate of three point eight per cent, so it keeps one point seven per cent, or one point seven million dollars a year.
- The branches are credited the two year rate of three point four per cent and pay three point one, so they keep zero point three per cent, three hundred thousand dollars.
- Treasury receives three point eight and pays three point four, keeping zero point four per cent, four hundred thousand dollars.
- That is its reward for the maturity mismatch, which treasury keeps.
- Check the total.
- The bank earns five point five minus three point one, which is two point four per cent, or two point four million, exactly the sum of the three pieces.

6 Leading practice 1: governance

- Treasury runs the framework centrally
- Policy approved by senior management or the ALCO
- Method reviewed independently
- Rates transparent and refreshed regularly
- Trap: business lines setting their own rates

IN THE LESSON

- Leading practice starts with governance.
- First, treasury runs the framework centrally, so there is one set of prices for the whole bank.
- Second, it does so under a policy approved by senior management or by the asset and liability committee, the senior group that oversees the bank's balance sheet, often called A L C O.
- Third, the method is reviewed independently, so the people who set the prices are challenged.
- Fourth, the rates are transparent, so every business line can see how its charge was built, and they are refreshed regularly, so they track the market.
- The usual mistake is to let business lines set their own rates.

7 Leading practice 2: scope and use

- Cover assets, liabilities and off-balance-sheet items
- Behavioural maturities where contractual ones mislead
- Exceptions documented and visible
- Prices feed product approval
- Prices feed performance measurement

IN THE LESSON

- The second group of practices is about scope and use.
- The framework covers assets, liabilities and off balance sheet commitments, such as undrawn credit lines, not just loans.
- It uses behavioural maturities where contractual ones mislead.
- A savings account can be withdrawn today, but much of it stays for years, and the price should reflect how long the money really stays.
- Exceptions, where a deal is priced off the curve, are documented and visible to management, not agreed quietly.
- And the prices are used.
- They feed product approval, so a new product is judged after its liquidity cost.
- And they feed performance measurement, so targets and bonuses reward the margin after the F T P charge.
- Prices that nobody uses change no behaviour.

8 Example 2: two classic mistakes

Same deals as Example 1. What if Halden makes the usual mistakes?

Assets only: branches get 0	pay 3.1% on $100m	**−$3.1m**
Branches' real contribution	3.4% − 3.1% on $100m	**+$0.3m**
Desk sets its own rate: 1 year	5.5% − 3.2% on $100m	**$2.3m**
Correct 5-year margin	5.5% − 3.8% on $100m	**$1.7m**
Desk profit overstated by	2.3 − 1.7	**$0.6m a year**

IN THE LESSON

- Same deals as Example one, but now Halden makes the usual mistakes.
- First, suppose it prices only assets.
- The loan desk is charged, but the branches get no credit at all.
- They pay three point one per cent on one hundred million dollars, so they show a loss of three point one million.
- Their real contribution, once credited the two year rate of three point four, is a profit of three hundred thousand.
- A bank that believes the first number will shrink its stable funding.
- Second, suppose the loan desk sets its own rate, and picks the cheaper one year rate of three point two per cent.
- Its margin shows five point five minus three point two, two point three million.
- The correct five year margin is one point seven million.
- So the desk's profit is overstated by six hundred thousand dollars a year.

9 The exam point for how LTP works

- LTP charges users and credits providers of funds
- Comprehensive: assets, liabilities, off-balance-sheet
- Centrally governed: treasury, approved policy, review
- Tied to incentives: product approval, performance
- Without all three, incentives drift from risk appetite

IN THE LESSON

- So here is the exam point.
- Liquidity transfer pricing charges the users of funds and credits the providers, at rates that reflect the cost of liquidity for each tenor and currency.
- It works only when three conditions hold together.
- It must be comprehensive, covering assets, liabilities and off balance sheet items.
- It must be centrally governed, run by treasury under an approved policy and independently reviewed.
- And it must be tied to incentives, through product approval and performance measurement.
- Without all three, business lines chase profits that ignore liquidity, and their incentives drift away from the bank's risk appetite and funding strategy.
- With them, each unit's profit tells the truth about the liquidity it uses or brings in.

10 Why practice is harder than design

- Behavioural models for products with no fixed maturity
- Curves for every currency and tenor, even in stress
- Data and systems that capture every product
- Rates refreshed often enough not to go stale
- Gaming, business resistance, need for sponsorship

IN THE LESSON

- Designing a transfer pricing scheme is the easy part.
- Putting it into practice is harder.
- Here are the difficulties in outline.
- First, many products have no meaningful fixed maturity, so the bank needs behavioural models.
- Second, it needs a reference curve for every currency and tenor, and that curve must still work in stress.
- Third, its data and systems must capture every product, including off balance sheet items.
- Fourth, the rates must be refreshed often enough that quotes do not go stale.
- And fifth, there are the human problems.
- Business lines game prices that differ from the market and resist charges that cut their profits, and the whole effort needs governance and senior sponsorship.

11 Behavioural maturities

- Non-maturity deposits: payable today, often stay years
- Revolving lines: drawn and repaid at the client's choice
- Prepayable loans: often repaid early when rates fall
- So behavioural models are needed
- But the models are uncertain

IN THE LESSON

- Contractual maturities say little about three kinds of product.
- Non maturity deposits, such as current and savings accounts, can be withdrawn today, yet a large part usually stays for years.
- Revolving lines of credit are drawn and repaid whenever the client chooses, so their balance has no fixed end.
- Prepayable loans, such as many mortgages, can be repaid early, for example when interest rates fall and borrowers refinance.
- For all three, the bank must estimate how long the money really stays, using models built on past customer behaviour.
- So behavioural models are needed.
- But the models are uncertain.
- Past behaviour may not hold in a stress, when depositors who looked stable may leave together.

12 Example 3: Halden's savings deposits

$200m instant-access savings. Model: 70% is a stable core of 3+ years

Contractual: all overnight	200 × 0.00%	**$0**
Stable core	70% × 200; rest overnight	**$140m**
Credit at 3-year premium	140 × 0.60%	**$0.84m**
If the core is only 50%	100 × 0.60%	**$0.60m**
Swing from the model choice	0.84 − 0.60	**$0.24m**

IN THE LESSON

- Halden's branches hold two hundred million dollars of instant access savings, and treasury's model says seventy per cent is a stable core that stays three years or more.
- Look at the liquidity credit the branches earn.
- Contractually, all the money is repayable overnight, and the overnight premium is zero, so the credit is nothing.
- Behaviourally, the stable core is seventy per cent of two hundred, one hundred and forty million, and the rest is treated as overnight.
- Credited at the three year premium of zero point six per cent, the core earns eight hundred and forty thousand dollars a year.
- But suppose a more cautious model puts the core at only fifty per cent.
- The credit is one hundred million times zero point six per cent, six hundred thousand.
- The model choice alone moves the credit by two hundred and forty thousand dollars.

13 Curves, data and systems

- A reference curve per currency and per tenor
- Term funding spreads: thin, volatile or unobservable
- Worst in a crisis, exactly when the price matters most
- Data and systems must capture every product
- Including off-balance-sheet items

IN THE LESSON

- The second difficulty is the curve.
- The bank needs a reference curve for each currency and each tenor, because dollar term funding and euro term funding cost different amounts.
- To build it, treasury looks at the spreads the bank pays on its own term funding.
- But those markets are often thin, with few trades, and the spreads are volatile.
- In a crisis they can become unobservable, because the bank cannot raise term funding at all.
- That happens exactly when the price matters most.
- The third difficulty is data and systems.
- To charge every unit correctly, the bank's systems must capture every product, by tenor and by currency.
- That includes off balance sheet items, such as undrawn lines and guarantees, which often sit in separate systems.

14 Example 4: a stale rate

Market 5-year premium jumps from 0.80% to 1.40%; Halden's curve still shows 0.80%

Charged: stale 5-year rate	3.00% + 0.80%	**3.80%**
Current cost of 5-year funds	3.00% + 1.40%	**4.40%**
Under-charge on $100m	0.60% × 100	**$0.6m a year**
Over the five-year life	0.6 × 5, undiscounted	**$3.0m**

Cure: refresh often, and at once when markets move sharply

IN THE LESSON

- The market's five year liquidity premium jumps from zero point eight per cent to one point four, but Halden refreshes its curve only once a quarter, so the published curve still shows zero point eight.
- This is the fourth difficulty, stale rates.
- A new five year loan of one hundred million dollars is charged the stale rate, three plus zero point eight, which is three point eight per cent.
- Funds of that tenor now really cost three plus one point four, four point four per cent.
- So the loan is under charged by zero point six per cent, which is six hundred thousand dollars a year.
- Over its five year life, ignoring discounting, that is three million dollars of liquidity cost that the desk never sees.
- The cure is to refresh the curve often, and at once when markets move sharply.

15 Example 5: gaming an over-credit

Treasury credits all deposits the 2-year rate, even hot money that can leave overnight

Hot money raised	by the branches	**$50m**
Excess credit: 2-year premium	50 × 0.40%	**$0.2m a year**
Fair excess: overnight premium	50 × 0.00%	**$0**
Paid for funding that can run	0.2 − 0	**$0.2m a year**

IN THE LESSON

- Treasury credits every deposit at the two year rate, even hot money, meaning large, rate sensitive balances that can leave overnight.
- This is the fifth difficulty, incentive distortion.
- The branches raise fifty million dollars of hot money.
- Compared with the overnight rate, the two year rate gives them an extra zero point four per cent, two hundred thousand dollars a year.
- The fair excess, at the overnight premium of zero, is nothing.
- So the bank pays two hundred thousand dollars a year for funding that can run at the first sign of trouble.
- And because that funding now looks profitable, the branches will chase more of it.
- An internal price that differs from the market is an arbitrage, and business lines are quick to find it.

16 People, and the exam point

- Gaming: grow what is over-credited, shun over-charged
- Business resistance to new charges
- Needs governance and senior sponsorship
- Trap: thinking the difficulty is purely technical
- Exam: behaviour, stress curves, stale rates, incentives

IN THE LESSON

- The last group of difficulties is about people.
- Any internal price that differs from the market will be gamed: business units grow whatever is over credited and shun whatever is over charged.
- Business lines also resist.
- A desk whose profit falls when a liquidity charge arrives will argue against the curve, the model and the timing.
- That is why the scheme needs strong governance and senior sponsorship, someone at the top who backs treasury when the arguments start.
- The common error is to think the difficulty is purely technical, a matter of models and systems.
- It is also organisational.
- For the exam, remember the four standard difficulties the exam stresses: behavioural modelling, building curves in stress, stale rates, and incentive distortion.

17 Three routes to an internal price

- Zero-cost: no liquidity charge or credit at all
- Average-cost: one pooled rate for every unit
- Pooled rate = total funding cost ÷ total funds
- Matched-maturity marginal cost: today's cost, same tenor
- Uses the bank's own curve for each tenor

IN THE LESSON

- How should the internal price be set?
- There are three broad routes.
- The first is zero cost.
- There is no liquidity charge or credit at all, so funds look free.
- The second is average cost.
- Every unit is charged, and credited, one pooled rate, whatever the tenor.
- The pooled rate equals the bank's total funding cost divided by its total funds.
- The third is matched maturity marginal cost.
- Each asset or liability is priced at the current cost of raising funds of the same tenor.
- Marginal means the cost of the next dollar raised today, not the average of what the bank paid in the past.
- It uses the bank's own curve for each tenor.

18 Example 6: Halden under zero cost

Zero cost: the desk's 5-year $100m loan at 5.5% is charged nothing for funds

Margin shown to the desk	5.5% − 0% on $100m	**$5.5m**
Margin after the 5-year FTP	5.5% − 3.8% on $100m	**$1.7m**
Profit overstated by	5.5 − 1.7	**$3.8m**

Funds look free: illiquid assets grow, stable funding is neglected

IN THE LESSON

- Under zero cost, the desk's five year loan of one hundred million dollars at five point five per cent is charged nothing for its funds.
- The margin shown to the desk is the full five point five per cent, or five point five million dollars a year.
- The margin after the five year F T P charge of three point eight per cent is one point seven million.
- So zero cost overstates the desk's profit by three point eight million dollars, the entire cost of the funds.
- Because funds look free, every unit is encouraged to hold long, illiquid assets, which seem to earn the most.
- And nobody is rewarded for raising stable funding, so it is neglected.

19 Example 7: Halden's pooled average rate

Halden's funds: $400m short-term at 3.1%, $600m term at 3.6%

Cost of short-term funds	400 × 3.1%	**$12.4m**
Cost of term funds	600 × 3.6%	**$21.6m**
Total funding cost	12.4 + 21.6	**$34.0m**
Pooled average rate	34.0 ÷ 1,000	**3.40%**

IN THE LESSON

- Halden's funds are four hundred million dollars of short term money at three point one per cent, and six hundred million of term funding at three point six per cent.
- The cost of the short term funds is four hundred times three point one per cent, twelve point four million dollars a year.
- The cost of the term funds is six hundred times three point six per cent, twenty one point six million.
- The total funding cost is twelve point four plus twenty one point six, thirty four million.
- Divide by total funds of one thousand million, and the pooled average rate is three point four per cent.
- Under average cost, every loan and every deposit, whether overnight or five years, is charged or credited three point four per cent.
- Its flaw shows up when we compare two loans.

20 Example 8: two loans under three routes

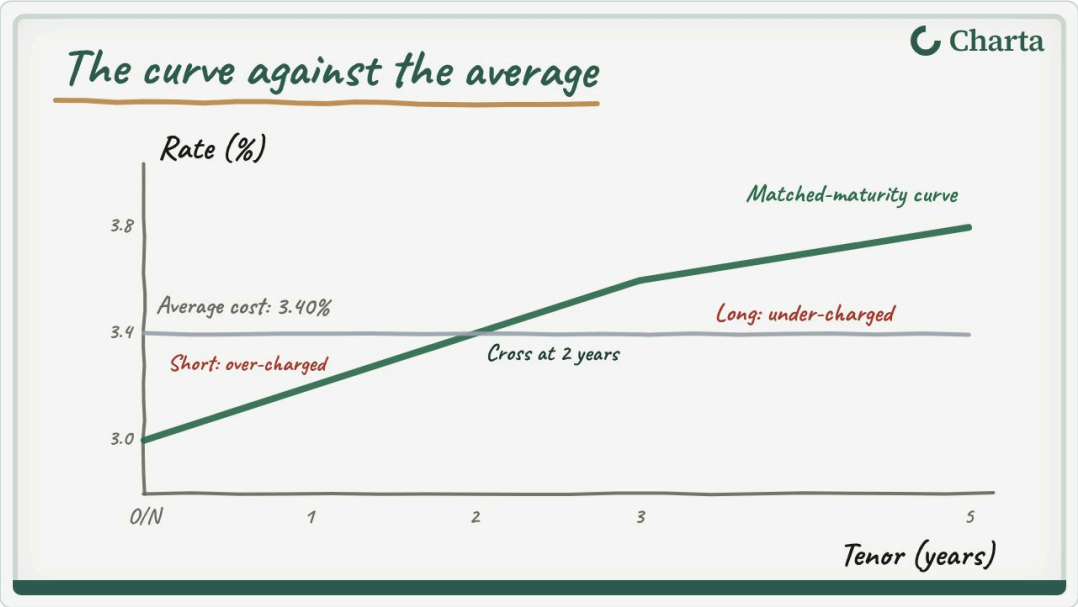
Margins on $100m loans: 1-year at 3.6% and 5-year at 5.5%

Route	1-year loan	5-year loan
Zero cost	3.6 − 0 = 3.60%	5.5 − 0 = 5.50%
Average cost	3.6 − 3.4 = 0.20%	5.5 − 3.4 = 2.10%
Matched maturity	3.6 − 3.2 = 0.40%	5.5 − 3.8 = 1.70%
Average vs matched	over-charged 0.20%	under-charged 0.40%

IN THE LESSON

- Margins on two loans of one hundred million dollars each: a one year loan at three point six per cent, and the five year loan at five point five.
- Under zero cost, the margins are the full loan rates, three point six and five point five per cent.
- Under average cost, both are charged three point four per cent, leaving zero point two per cent on the one year loan and two point one per cent on the five year loan.
- Under matched maturity, the one year loan is charged the one year rate of three point two, leaving zero point four.
- The five year loan is charged three point eight, leaving one point seven.
- The last row compares average with matched.
- The short loan is over charged by zero point two per cent, and the long loan is under charged by zero point four.
- That is a cross subsidy from short business to long business.

21 The curve against the average



IN THE LESSON

- Here is the same comparison as a picture.
- Along the bottom is the tenor, from overnight to five years.
- Up the side is the rate, from three to three point eight per cent.
- The rising curve is Halden's matched maturity curve, from three per cent overnight to three point eight at five years.
- The flat grey line is the average cost of three point four per cent.
- The two cross at two years.
- To the left of that point, short tenors are charged the average, which is above their true cost, so they are over charged.
- To the right, long tenors are charged the average, which is below their true cost, so they are under charged.
- Under average cost, the business lines that lend long are subsidised by those that lend short, which pushes the bank toward long, illiquid assets.

22 Example 9: an amortising loan in tranches

A $90m 3-year loan repaid $30m a year: three tranches of $30m

Tranche 1: 1-year rate	30 × 3.20% × 1 year	**$0.96m**
Tranche 2: 2-year rate	30 × 3.40% × 2 years	**$2.04m**
Tranche 3: 3-year rate	30 × 3.60% × 3 years	**$3.24m**
Total charge over the life	0.96 + 2.04 + 3.24	**$6.24m**
Wrong: all at the 3-year rate	3.60% × (90 + 60 + 30)	**$6.48m**

Over-charge from one rate: 6.48 − 6.24 = $0.24m

IN THE LESSON

- A ninety million dollar, three year amortising loan, meaning one repaid in instalments, is repaid thirty million a year, so treasury splits it into three tranches of thirty million, each priced at its own tenor.
- Tranche one is repaid after one year, so it pays the one year rate: thirty million times three point two per cent for one year, nine hundred and sixty thousand dollars.
- Tranche two runs two years at three point four per cent, two point zero four million.
- Tranche three runs three years at three point six per cent, three point two four million.
- The total charge over the life is six point two four million.
- Charging the whole loan at the three year rate would cost three point six per cent on balances of ninety, sixty and thirty, which is six point four eight million, an over charge of two hundred and forty thousand dollars.

23 Matched maturity: why it is best practice

- Rate reflects both maturity and today's market
- Uses the bank's own curve, per tenor and currency
- Treasury keeps the residual mismatch
- Average cost cross-subsidises; zero cost ignores liquidity
- Exam point: matched maturity is best practice

IN THE LESSON

- Why is matched maturity marginal cost regarded as best practice?
- Because each rate reflects both the maturity of the position and today's market.
- A five year loan pays for five year money, at what that money costs now.
- It uses the bank's own curve, per tenor and per currency, so the price reflects what this bank really pays.
- The business lines are then charged for exactly the liquidity they use, and treasury keeps the residual mismatch, as it did with the zero point four per cent in Example one, and manages it centrally.
- By contrast, average cost cross subsidises, and zero cost ignores liquidity altogether.
- So the exam point: matched maturity marginal cost gives the most accurate signal, and it is regarded as best practice.

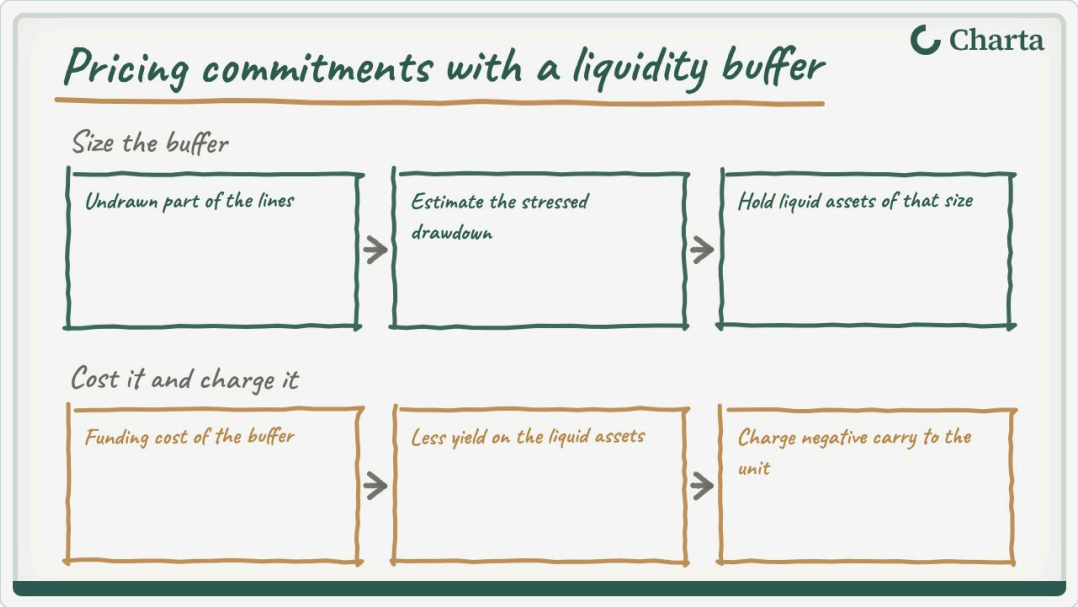
24 Contingent liquidity risk

- Off-balance-sheet items used in stress: bank must fund
- Undrawn lines, guarantees, margin calls
- Not on the balance sheet, so escapes ordinary FTP
- Unpriced commitments look free: desks write too many
- Practice: charge the issuing unit the cost of cover

IN THE LESSON

- Now the last topic, contingent liquidity risk.
- It is the risk that off balance sheet items are used in stress, so the bank must find funding unexpectedly.
- Typical items are undrawn credit lines, guarantees and margin calls.
- A company with an undrawn line from Halden tends to draw it when it cannot borrow elsewhere, which is often when Halden itself finds funding hard.
- Because an undrawn commitment is not on the balance sheet, it escapes ordinary transfer pricing.
- There is no balance, so there is nothing to charge.
- Unpriced commitments therefore look free, and the businesses that write them write too many.
- The practice is to charge the issuing unit, the business that wrote the commitment, for the cost of covering it.

25 Pricing commitments with a liquidity buffer



IN THE LESSON

- Here is the standard method in two rows.
- The first row sizes the buffer.
- Start from the undrawn part of the lines, because the drawn part is already on the balance sheet and already transfer priced.
- Estimate the stressed drawdown, the share of the undrawn amount that clients would draw in a stress.
- Then hold liquid assets of that size, a buffer of high quality securities that can be sold or pledged at once.
- The second row costs the buffer and charges it.
- Start from the funding cost of the buffer, which must be funded with term money so that it is still there in a stress.
- Less the yield on the liquid assets, which is lower, because safe and liquid assets pay little.
- The difference is the negative carry, and it is charged to the unit that wrote the lines.

26 Two ways to cost contingent liquidity

Buffer cost = Draw × Undrawn × (Funding − Yield)
Expected cost = Prob × Draw × Line × Premium

Draw	Stressed share of undrawn drawn
Negative carry	Funding cost − liquid asset yield
Prob	Probability of the stress
Line	The undrawn commitment
Premium	Stressed liquidity premium

IN THE LESSON

- Written as a formula, the buffer cost is the drawdown fraction, Draw, times the undrawn amount, times the funding cost minus the yield on the liquid assets.
- That bracket is the negative carry.
- An alternative is expected cost, which weights the line by the draw and by the chance of stress.
- Cost equals Prob times Draw times Line times Premium.
- Prob is the probability of stress.
- Draw is again the drawdown fraction.
- Line is the commitment size, here the undrawn amount.
- And Premium is the stressed liquidity premium, the extra the bank would pay for funds in that stress.
- The buffer approach charges for insurance held every day, while expected cost charges the average cost of being caught short.
- Both apply the rate to the stressed draw on the undrawn part, never to the full line.

27 Example 10: the cost of Halden's credit lines

Lines $600m, drawn $100m. Stressed drawdown 30%. Funding 3.40%, bills 2.90%

Undrawn amount	600 − 100	**$500m**
Buffer: stressed drawdown	30% × 500	**$150m**
Negative carry	3.40% − 2.90%	**0.50%**
Annual cost of the buffer	150 × 0.50%	**$0.75m**
Charge per undrawn dollar	0.75 ÷ 500	**0.15% a year**

IN THE LESSON

- Halden's lines total six hundred million dollars, of which one hundred million is drawn.
- The stressed drawdown is thirty per cent.
- The buffer is funded at the two year rate of three point four per cent and held in government bills yielding two point nine per cent.
- The undrawn amount is six hundred minus one hundred, five hundred million.
- The buffer is thirty per cent of five hundred, one hundred and fifty million.
- The negative carry is three point four minus two point nine, zero point five per cent.
- So the buffer costs one hundred and fifty million times zero point five per cent, seven hundred and fifty thousand dollars a year.
- Spread over the undrawn amount, seven hundred and fifty thousand divided by five hundred million is zero point one five per cent a year.
- That is the charge per undrawn dollar, the least the desk should ask of clients.

28 Example 11: wrong bases, and expected cost

Same lines. Stress probability 10%, stressed liquidity premium 2.0%

Wrong: carry on the full line	600 × 0.50%	**$3.0m**
Wrong: carry on the drawn amount	100 × 0.50%	**$0.5m**
Right: on stressed draw	150 × 0.50%	**$0.75m**
Expected cost	10% × 30% × 500 × 2.0%	**$0.30m**

Full line: 3.0 ÷ 0.75 = 4 times too much

IN THE LESSON

- Same lines, with a stress probability of ten per cent and a stressed liquidity premium of two per cent.
- First the classic mistakes.
- Applying the carry to the full line gives six hundred million times zero point five per cent, three million dollars, four times too much.
- Applying it to the drawn amount gives one hundred million times zero point five per cent, five hundred thousand.
- That is wrong too, because the drawn part is already priced and the risk lies in the undrawn part.
- The right answer applies the carry to the stressed draw of one hundred and fifty million, giving seven hundred and fifty thousand.
- Now the alternative.
- Expected cost is ten per cent times thirty per cent times five hundred million times two per cent, which is three hundred thousand dollars a year.

29 Mistakes to avoid

- Letting business lines set their own rates
- Pricing only assets, or ignoring off-balance-sheet lines
- Contractual maturities for deposits that really stay
- Average or zero cost instead of matched maturity
- Contingent charge on the full line or the drawn amount

IN THE LESSON

- Before the quiz, here are the mistakes to avoid across the whole topic.
- Do not let business lines set their own rates.
- Treasury sets them centrally, under an approved policy.
- Do not price only assets, or ignore off balance sheet lines, because the framework must be comprehensive.
- Do not use contractual maturities for deposits that really stay for years.
- Use behavioural maturities, and remember that the models are uncertain.
- Do not settle for average or zero cost when the curve slopes, because matched maturity marginal cost is best practice.
- And do not apply the contingent liquidity charge to the full line or to the drawn amount.
- Size the buffer from the stressed drawdown on the undrawn part, and cost it at the negative carry.

30 Try three quick questions

1. Pooled cost 3.5%; 4-year FTP 4.2%. A 4-year loan yields 5.0%. Margins?
   Answer: Average 1.5%; matched 0.8%. Under-charged by 0.7%.
2. Undrawn $200m, drawdown 40%, funding 4.0%, liquid assets 3.5%. Buffer cost?
   Answer: Buffer $80m × 0.5% carry = $0.4m a year.
3. Savings repayable on demand but mostly stay for years. Which maturity?
   Answer: Behavioural: credit the stable core at its tenor.

IN THE LESSON

- Try three quick questions, then listen to the answers.
- Question one.
- A bank's pooled funding cost is three point five per cent, and its four year F T P rate is four point two per cent.
- A four year loan yields five per cent.
- What margin does each route show?
- Average cost shows five minus three point five, one point five per cent.
- Matched maturity shows five minus four point two, zero point eight per cent, so average cost under charges the loan by zero point seven per cent.
- Question two.
- Undrawn lines are two hundred million dollars, the stressed drawdown is forty per cent, funding costs four per cent and liquid assets yield three point five.
- What does the buffer cost?
- The buffer is eighty million and the carry zero point five per cent, so the cost is four hundred thousand dollars a year.
- Question three.
- A savings account is repayable on demand but mostly stays for years.
- Which maturity should it use?
- Its behavioural maturity: credit the stable core at its tenor.