CHARTA LEARNING · LESSON NOTES

# Basel III Reforms: The Big Picture

FRM Part II

## 1 A story: same loans, different answers

- Fenwick and Ashby: similar loans, similar terms
- Both hold $9bn of common equity tier 1
- Each bank's own model measures the risk
- Very different ratios for the same risk
- Hard to compare and hard to trust

IN THE LESSON

- Start with a puzzle.
- Fenwick Bank and a rival, Ashby Bank, lend to very similar companies, on similar terms.
- Both have nine billion dollars of their best capital, common equity tier one.
- Yet Fenwick reports a much stronger capital ratio than Ashby.
- Nobody has cheated.
- Each bank simply measured the riskiness of its loans with its own internal model, and the two models gave very different answers.
- Investors and supervisors now face a real problem.
- Is Fenwick truly safer, or does its model just see less risk?
- When the same portfolio can give such different numbers, capital ratios become hard to compare and hard to trust.
- This puzzle is what the December twenty seventeen reforms were built to solve.

## 2 The capital ratio has two halves

**Capital ratio = Capital ÷ RWA**
**RWA = sum of exposure × risk weight**

| | |
|---|---|
| **Capital: the numerator** | Loss-absorbing funds, e.g. equity |
| **Risk-weighted assets** | Exposures scaled by risk weights |
| **Capital ratio** | What supervisors and markets read |

IN THE LESSON

- To see where the problem lives, look at the capital ratio.
- Capital, on top, is the loss absorbing money the bank holds, such as common equity.
- Risk weighted assets, written R W A, sit underneath.
- They are the bank's exposures, each scaled by a risk weight, so a risky loan counts for more than a safe one.
- The capital ratio, capital divided by risk weighted assets, is the number supervisors and markets read.
- A bank can raise its ratio in two ways: hold more capital, or report fewer risk weighted assets.
- The first is expensive.
- The second can happen quietly inside a model.
- Keep this picture in mind, because the whole lesson is about the bottom half of the fraction.

## 3 Example 1: one portfolio, two ratios

*Both banks: CET1 $9bn on similar loans. Only the internal models differ*

| | | |
|---|---|---|
| **Fenwick: model RWA** | its own internal model | **$75bn** |
| **Ashby: model RWA** | similar loans | **$120bn** |
| **Fenwick: capital ratio** | 9 ÷ 75 | **12.0%** |
| **Ashby: capital ratio** | 9 ÷ 120 | **7.5%** |
| **Ratio of the two RWAs** | 120 ÷ 75 | **1.6 times** |

IN THE LESSON

- Here are the numbers.
- Fenwick's internal model puts its risk weighted assets at seventy five billion dollars.
- Ashby's model, on a similar portfolio, gives one hundred and twenty billion.
- Fenwick's ratio is nine divided by seventy five, which is twelve per cent.
- Ashby's is nine divided by one hundred and twenty, which is seven point five per cent.
- Ashby's figure for risk weighted assets is one point six times Fenwick's, for loans that look much the same.
- The capital is identical, and the underlying risk is much the same.
- Only the denominator differs.
- This is what is meant by excessive variability in risk weighted assets, and it is the central problem behind the reforms.

## 4 What Basel III in 2010 did, and what it left alone

*The 2010 package fixed the numerator; the denominator was left largely alone*

| 2010 Basel III | Effect |
|---|---|
| Quality of capital | Raised |
| Quantity of capital | Raised |
| Buffers on top of minimums | Added |
| Leverage ratio, liquidity rules | Added |
| Rules for measuring RWA | Mostly unchanged |

IN THE LESSON

- Why was this still a problem after the first Basel three package of twenty ten?
- Because that package worked mainly on the top half of the fraction.
- It raised the quality of capital, so more of it had to be real common equity.
- It raised the quantity, with higher minimum ratios.
- It added capital buffers on top of the minimums.
- It brought in a leverage ratio, which ignores risk weights altogether, and new liquidity standards.
- But it left most of the rules for measuring risk weighted assets as they were.
- So the numerator got stronger, while the denominator could still vary widely from bank to bank.
- That gap is what was left to fix.

## 5 Why RWA variability needed fixing

- The crisis: some banks looked strong only on paper
- Committee studies: same portfolios, very different RWA
- Part real risk, part modelling choices
- Risk-based ratios hard to compare and to trust

IN THE LESSON

- What showed that the denominator was the weak spot?
- First, the financial crisis.
- Some banks that looked well capitalised on paper turned out to be thinly protected, because their risk weights had been low.
- Second, studies by the Basel Committee after the crisis.
- They gave banks the same test portfolios and found that risk weighted assets computed with internal models varied far too much across banks for similar risks.
- Some of that variation reflects real differences in risk, and some reflects modelling choices.
- The result was that risk based capital ratios were hard to compare across banks and hard to trust.
- A ratio that cannot be trusted cannot do its job.

## 6 December 2017: three aims, four tools

*Aims: less RWA variability, credible RWA, comparable ratios*

| Tool | What it does |
|---|---|
| Risk-sensitive standardised rules | A better fallback measure |
| Constrain internal models | Cut where least reliable |
| Revised output floor | Backstop to modelled RWA |
| Refined leverage ratio | Check with no risk weights |

IN THE LESSON

- The December twenty seventeen reforms completed the post crisis work, and they had three aims.
- To cut excessive variability in risk weighted assets.
- To restore credibility to how risk weighted assets are calculated.
- And to improve the comparability of capital ratios across banks.
- They used four tools.
- First, make the standardised approaches more risk sensitive, so that the fallback is a better measure in its own right.
- Second, constrain the use of internal models, where they had proved least reliable.
- Third, add a revised output floor, a backstop that stops modelled numbers from falling too far below the standardised ones.
- Fourth, refine the leverage ratio, the check that uses no risk weights.
- We take each tool in turn.

## 7 Example 2: the effect on Fenwick

*Fenwick: CET1 stays $9bn; RWA rises from $75bn to $87bn*

| | | |
|---|---|---|
| **Capital, before and after** | unchanged | **$9bn** |
| **Ratio before** | 9 ÷ 75 | **12.0%** |
| **Ratio after** | 9 ÷ 87 | **10.34%** |
| **Capital to restore 12%** | 12% × 87 | **$10.44bn** |
| **Extra capital needed** | 10.44 − 9 | **$1.44bn** |

*The reform changes how RWA is measured, not what counts as capital*

IN THE LESSON

- What is the effect?
- It falls mostly on the denominator.
- Fenwick's capital does not change: still nine billion dollars of common equity.
- But under the new rules its risk weighted assets rise from seventy five billion to eighty seven billion: about five billion from the other changes and seven billion from the output floor, as we will see.
- The ratio falls from twelve per cent to about ten point three four per cent.
- To get back to twelve per cent, Fenwick would need twelve per cent of eighty seven billion, about ten point four four billion dollars of capital, an extra one point four four billion.
- The exam trap: the reform targets the framework for risk weighted assets, not the definition of capital.

## 8 Five areas that changed

*The map for this part of the lesson*

| Area | Headline change |
|---|---|
| Credit: standardised | More granular risk weights |
| Credit: IRB | Narrower scope, input floors |
| CVA risk | Internal model withdrawn |
| Operational risk | One standardised approach |
| Leverage ratio | Refined exposure, G-SIB buffer |

IN THE LESSON

- Now to what actually changed.
- The December twenty seventeen revisions touched five areas, and this table is the map for the next part of the lesson.
- For credit risk under the standardised approach, the risk weights became more granular.
- For credit risk under the internal ratings based approach, written I R B, the use of models was narrowed and floors were added to the inputs.
- For C V A risk, the internal model approach was withdrawn.
- For operational risk, three old approaches were replaced by one standardised approach.
- And for the leverage ratio, the exposure measure was refined and the biggest banks got an extra buffer.

## 9 Credit risk: the standardised approach

- More granular risk weights
- Real estate: weights based on loan-to-value
- Due diligence on external ratings
- An alternative for unrated banks and corporates
- Aim: a fallback that measures risk well

**IN THE LESSON**

- Start with the standardised approach for credit risk, which most banks in the world use.
- Here the regulator sets the risk weights.
- The reforms made them more risk sensitive in four ways.
- First, the risk weights are more granular, with more steps, so that different risks get different weights.
- Second, real estate loans are weighted by their loan to value ratio, the size of the loan divided by the value of the property.
- Third, banks that use external credit ratings must carry out due diligence.
- Fourth, there is an alternative for unrated banks and corporates, and for countries that do not allow ratings in regulation.
- The aim: a fallback that measures risk well.

## 10 Example 3: mortgages weighted by loan-to-value

*LTV table (part): 30% at 60-80%, 40% at 80-90%, 50% at 90-100%*

| | | |
|---|---|---|
| **Loan A: loan-to-value** | 400,000 ÷ 500,000 | **80%** |
| **Loan A: RWA at 30%** | 400,000 × 30% | **$120,000** |
| **Loan B: loan-to-value** | 285,000 ÷ 300,000 | **95%** |
| **Loan B: RWA at 50%** | 285,000 × 50% | **$142,500** |
| **Old flat 35%: A, B** | 140,000 and 99,750 | **Same 35% for both** |

**IN THE LESSON**

- Fenwick makes two home loans repaid from the borrower's income.
- The loan to value table applies one weight to the whole loan: thirty per cent from sixty to eighty per cent, forty per cent from eighty to ninety, and fifty per cent from ninety to one hundred.
- Loan A is four hundred thousand dollars on a house worth five hundred thousand, a loan to value of eighty per cent.
- That earns thirty per cent, so risk weighted assets are one hundred and twenty thousand.
- Loan B is two hundred and eighty five thousand on a house worth three hundred thousand, a loan to value of ninety five per cent.
- That falls in the ninety to one hundred band and earns fifty per cent, giving one hundred and forty two thousand five hundred.
- Under the old flat thirty five per cent, loan A would carry one hundred and forty thousand and loan B ninety nine thousand seven hundred and fifty.
- The riskier loan gets less, simply because it is smaller.

## 11 Ratings: due diligence, and life without them

- Old: read the risk weight off the rating
- New: the rating is a starting point only
- Own review shows more risk: use a higher weight
- Due diligence never lowers the weight
- No rating: grade banks, corporates against criteria

**IN THE LESSON**

- Two more changes concern credit ratings.
- Under the old approach, a bank could take an agency rating and read off the risk weight with no further thought.
- Now the rating is a starting point, not a substitute for the bank's own work.
- A bank must do due diligence to understand the borrower's risk.
- If its own review shows the risk is higher than the rating suggests, it must use a higher risk weight.
- Due diligence can only raise the weight.
- It can never give a lower weight than the rating implies.
- Next, the alternative.
- Some borrowers have no rating, and some countries do not allow ratings in their rules at all.
- For these, the reforms provide a non ratings approach for banks and corporates, based on the bank's own assessment against set criteria.

## 12 Credit risk: the IRB approach

*Foundation IRB: bank estimates PD only. Advanced IRB: PD, LGD and EAD*

| Exposure | What changed |
|---|---|
| Large corporates, revenue > €500m | No advanced IRB |
| Banks, other financial firms | No advanced IRB |
| Equities | No IRB at all |
| All IRB exposures | Floors on PD, LGD, EAD |

**IN THE LESSON**

- Now the internal ratings based approach, where approved banks use their own models.
- Under foundation I R B, the bank estimates only the probability of default, P D, and the supervisor sets loss given default, L G D, and exposure at default, E A D.
- Under advanced I R B, the bank estimates all three.
- The reforms remove advanced I R B for large corporates, meaning revenue above five hundred million euros, and for banks and other financial institutions.
- Those exposures can use foundation I R B at most.
- I R B is removed entirely for equities, which go to the standardised approach.
- And floors now apply to the inputs: probability of default, loss given default and exposure at default cannot fall below set minimums.

## 13 Why narrow the use of models here?

- Large corporates, banks, financials rarely default
- Few defaults: hard to model, results vary widely
- Equities raise a similar problem
- Input floors stop near-zero PD, LGD or EAD
- Keep models where the data supports them

**IN THE LESSON**

- Why these exposures?
- The answer lies in data.
- Large corporates, banks and other financial institutions rarely default, so a bank sees very few defaults to build a model on.
- These are called low default portfolios.
- With so little data, two banks can build very different models for loss given default on the same borrower, and both can be defended.
- That is a recipe for the variability we saw earlier.
- Equities raise a similar problem.
- Input floors attack the same issue from another side.
- However confident the model is, a bank cannot assume an almost zero probability of default or loss.
- The aim is not to ban models, but to keep them where the data supports them.

## 14 Example 4: which approach can Fenwick use?

*Line for large corporates: revenue above €500m. Assume a PD floor of 0.05%*

| | | |
|---|---|---|
| **Corporate, revenue €2bn** | above €500m | **F-IRB at most** |
| **Corporate, revenue €200m** | below €500m | **A-IRB allowed** |
| **Loan to another bank** | financial institution | **F-IRB at most** |
| **Equity stake** | IRB removed | **Standardised** |
| **Model PD 0.02%** | floor 0.05% | **Use 0.05%** |

**IN THE LESSON**

- Let us sort five of Fenwick's exposures.
- A corporate with revenue of two billion euros is above the five hundred million line, so foundation I R B is the most Fenwick may use.
- A corporate with revenue of two hundred million euros is below the line, so advanced I R B is still allowed if approved.
- A loan to another bank is a financial institution exposure, so foundation I R B at most.
- An equity stake loses I R B and goes to the standardised approach.
- Finally, Fenwick's model gives a top rated corporate a probability of default of point zero two per cent.
- A floor of point zero five per cent applies, so the bank must use point zero five per cent.

## 15 CVA risk: the internal model goes

- CVA: value lost to the chance a counterparty defaults
- CVA risk: losses as counterparty spreads move
- The internal model approach is withdrawn
- Basic approach, BA-CVA: simpler
- Standardised, SA-CVA: more risk-sensitive, approved

**IN THE LESSON**

- The third area is C V A risk.
- Credit valuation adjustment, C V A, is the reduction in the value of a derivative to allow for the chance that the counterparty defaults.
- When the counterparty's credit spread widens, C V A rises and the bank books a loss, even if nobody defaults.
- C V A risk is the risk of those losses, and banks hold capital against it.
- Before the reforms, some banks could compute this capital with an internal model.
- The reforms withdraw the internal model approach.
- What remains are two approaches.
- The basic approach, B A C V A, is simpler.
- The standardised approach, S A C V A, is more risk sensitive, and it needs supervisory approval.

## 16 Operational risk: one approach replaces three

*Basic indicator, standardised and AMA are all replaced*

| Before | After |
|---|---|
| Basic indicator approach | One standardised approach |
| Standardised approach | One standardised approach |
| Advanced measurement (AMA) | One standardised approach |
| Building blocks | BIC and ILM; no model |

IN THE LESSON

- The fourth area is operational risk, the risk of loss from failed processes, people, systems or external events.
- Before the reforms, a bank could choose among three approaches.
- The basic indicator approach and the standardised approach both scaled a bank's gross income by fixed percentages.
- The advanced measurement approach, A M A, let banks use their own models, and those models varied widely.
- The reforms replace all three with one standardised approach.
- It has two building blocks.
- The business indicator component, B I C, grows with the size of the bank's business.
- The internal loss multiplier, I L M, adjusts for the bank's own history of operational losses.
- No internal model is allowed.

## 17 The new operational risk capital

**Capital = BIC × ILM**
**Operational risk RWA = 12.5 × capital**

| | |
|---|---|
| **BIC: business indicator** | Grows with business size |
| **Internal loss multiplier** | 1 when loss component = BIC |
| **Operational risk capital** | Capital for operational risk |

IN THE LESSON

- Here is the formula.
- Operational risk capital equals the business indicator component times the internal loss multiplier.
- The business indicator component, B I C, comes from a measure of the bank's business volume, built from its financial statements, so a bigger business means a bigger charge.
- The internal loss multiplier, I L M, compares the bank's past operational losses with the size of its business.
- It equals one when the loss component, fifteen times the bank's average annual losses, equals the business indicator component.
- A bank with heavy past losses for its size gets a multiplier above one, and a bank with light losses gets one below one.
- To turn capital into risk weighted assets, multiply by twelve point five.
- The details belong to the next lesson.

## 18 Example 5: Fenwick's operational risk charge

*Fenwick: BIC $640m. Heavy past losses give an ILM of 1.25*

| | | |
|---|---|---|
| **Capital, ILM 1.25** | 640 × 1.25 | **$800m** |
| **Operational risk RWA** | 12.5 × 800 | **$10bn** |
| **Capital, ILM 1.0** | 640 × 1.0 | **$640m** |
| **Capital, ILM 0.9** | 640 × 0.9 | **$576m** |

*Same business, different loss history, different charge*

IN THE LESSON

- Suppose Fenwick's business indicator component is six hundred and forty million dollars, and its past losses have been heavy, giving an internal loss multiplier of one point two five.
- Capital is six hundred and forty times one point two five, which is eight hundred million dollars.
- Risk weighted assets for operational risk are twelve point five times eight hundred million, which is ten billion dollars.
- Now compare.
- If Fenwick's loss component exactly matched its business indicator component, the multiplier would be one, and capital would be six hundred and forty times one, which is six hundred and forty million.
- With a light loss history and a multiplier of point nine, capital would be five hundred and seventy six million.
- Same business, different loss history, different charge.

## 19 The leverage ratio: refined, with a G-SIB buffer

- Tier 1 capital ÷ exposure measure, no risk weights
- Minimum 3%: a backstop no model can lower
- Change 1: exposure measure refined
- Change 2: G-SIBs add a leverage buffer
- Buffer = 50% of the G-SIB risk-based surcharge

IN THE LESSON

- The fifth area is the leverage ratio.
- It is tier one capital divided by an exposure measure that uses no risk weights at all, so it acts as a simple backstop that no model can lower.
- The minimum is three per cent.
- The reforms made two changes.
- First, they refined the exposure measure, the denominator, to fix how certain items are counted, such as derivatives and items off the balance sheet.
- Second, they added a buffer for global systemically important banks, written G S I B.
- These are banks whose failure would shake the world system, and they already face a surcharge on their risk based capital.
- Their leverage buffer equals half of that surcharge.

## 20 Example 6: the leverage buffer

*Fenwick as a G-SIB: Tier 1 $10bn, exposure $300bn, surcharge 1.5%*

| | | |
|---|---|---|
| **Leverage ratio** | 10 ÷ 300 | **3.33%** |
| **Minimum for all banks** | Tier 1 ÷ exposure | **3.0%** |
| **G-SIB leverage buffer** | 50% × 1.5% | **0.75%** |
| **Requirement with buffer** | 3% + 0.75% | **3.75%** |
| **Tier 1 shortfall** | 3.75% × 300 − 10 | **$1.25bn** |

IN THE LESSON

- Suppose Fenwick were a global systemically important bank.
- It has tier one capital of ten billion dollars and a leverage exposure measure of three hundred billion.
- Its leverage ratio is ten divided by three hundred, about three point three three per cent.
- That clears the minimum of three per cent.
- But Fenwick's risk based surcharge is one point five per cent, so its leverage buffer is half of that, point seven five per cent.
- The requirement with the buffer is three point seven five per cent.
- Fenwick needs three point seven five per cent of three hundred billion, which is eleven point two five billion of tier one capital.
- It is short by one point two five billion dollars.

## 21 Curtailed, not abolished

*Internal models are curtailed, not abolished*

| Area | Models after the reforms |
|---|---|
| Credit: most exposures | IRB stays, with input floors |
| Large corporates, financials | Foundation IRB only |
| Equities | No IRB |
| CVA risk | No internal model |
| Operational risk | No internal model |

IN THE LESSON

- Before we leave the five areas, here is the most tested point.
- Internal models are curtailed, not abolished.
- Look at the table.
- For credit risk, I R B remains, including advanced I R B for many exposures such as most smaller corporates, but with input floors.
- For large corporates and financial institutions, foundation I R B remains.
- Equities lose I R B.
- For C V A risk, the internal model approach goes, leaving the basic and standardised approaches.
- For operational risk, models go entirely.
- So among these five areas, models survive only in credit risk, and even there they face floors and, as we see next, an overall output floor.
- A question that says Basel three banned internal models is wrong.

## 22 The output floor: a backstop for models

- Stops modelled RWA falling too far below standardised
- U-TRWA: approved models, standardised elsewhere
- S-TRWA: whole portfolio, standardised only
- As if the bank had no models at all

**IN THE LESSON**

- Now the third outcome: the revised output floor.
- Go back to the puzzle at the start.
- Even with all the changes we have seen, a bank's models might still give much lower risk weighted assets than the standardised rules would.
- The output floor stops modelled risk weighted assets from falling too far below the standardised figure.
- It needs two measures.
- The first is U T R W A, the bank's total risk weighted assets as it actually computes them, using its approved internal models where it has them, and standardised approaches elsewhere.
- The second is S T R W A, the risk weighted assets for the whole portfolio, computed with the standardised approaches only, as if the bank had no models at all.

## 23 What goes into each measure

*S-TRWA uses only the standardised approaches*

| Risk | U-TRWA | S-TRWA |
|---|---|---|
| Credit | IRB where approved | Standardised approach |
| Market | Models where approved | Revised standardised |
| Operational | Standardised approach | Standardised approach |

**IN THE LESSON**

- Let us be precise about what goes into each measure.
- For credit risk, U T R W A uses I R B where the bank is approved, and S T R W A uses the standardised approach for credit risk.
- For market risk, U T R W A uses the internal models approach where approved, and S T R W A uses the revised standardised approach for market risk.
- For operational risk, there is only one approach now, the standardised one, so both measures use it, and operational risk is the same on both sides.
- So S T R W A is built mainly from three pieces: the standardised approach for credit risk, the revised standardised approach for market risk, and the standardised approach for operational risk.

## 24 The floor formula

**RWA = max( U-TRWA , 72.5% × S-TRWA )**
**Models can save at most 27.5%**

| | |
|---|---|
| **U-TRWA: as computed** | Models where approved |
| **S-TRWA: standardised only** | Whole book, no models |
| **Floor share: 72.5%** | Applied to S-TRWA only |

**IN THE LESSON**

- Here is the rule.
- The bank's total risk weighted assets are the higher of two numbers.
- The first is U T R W A, the bank's figure as actually computed, with models where approved.
- The second is seventy two point five per cent of S T R W A, the standardised figure.
- If the bank's models give a number above seventy two point five per cent of the standardised figure, the floor does nothing.
- If they give less, the floor lifts risk weighted assets up to that level.
- In other words, models can save a bank at most twenty seven and a half per cent compared with the standardised approaches.
- Notice where the seventy two point five per cent goes.
- It multiplies the standardised figure, never the bank's own figure.

## 25 Example 7: does the floor bite at Fenwick?

*Fenwick after the other reforms: U-TRWA $80bn, S-TRWA $120bn*

| | | |
|---|---|---|
| **Modelled RWA** | U-TRWA | **$80bn** |
| **Floor** | 72.5% × 120 | **$87bn** |
| **RWA used** | max(80, 87) | **$87bn** |
| **Added by the floor** | 87 − 80 | **$7bn** |
| **CET1 ratio: floored, model** | 9 ÷ 87 and 9 ÷ 80 | **10.34%, 11.25%** |

IN THE LESSON

- Now Fenwick.
- After all the other changes, its modelled figure, U T R W A, is eighty billion dollars.
- If it used the standardised approaches for everything, S T R W A would be one hundred and twenty billion.
- The floor is seventy two point five per cent of one hundred and twenty, which is eighty seven billion.
- Eighty seven is higher than eighty, so the floor binds, and Fenwick's risk weighted assets are eighty seven billion.
- That is the figure from our earlier example.
- The floor adds seven billion.
- With capital of nine billion, Fenwick's ratio is about ten point three four per cent, instead of eleven point two five per cent on the modelled figure alone.

## 26 Example 8: two ways to get the floor wrong

*Fenwick by risk type. Modelled: 62, 8, 10. Standardised: 100, 10, 10 ($bn)*

| | | |
|---|---|---|
| **Wrong: 72.5% of own RWA** | 72.5% × 80 | **$58bn** |
| **By type: credit** | max(62, 72.5% × 100) | **$72.5bn** |
| **By type: market** | max(8, 72.5% × 10) | **$8bn** |
| **By type: operational** | same on both sides | **$10bn** |
| **Wrong total vs right total** | 90.5 by type; floor on total | **$90.5bn vs $87bn** |

IN THE LESSON

- Here are two errors.
- First, applying seventy two point five per cent to the bank's own figure.
- Seventy two point five per cent of eighty is fifty eight billion, which is below eighty, so the floor seems never to bite.
- That is wrong.
- The second error is to apply the floor risk type by risk type.
- Fenwick's credit risk is sixty two billion modelled against one hundred billion standardised, so seventy two point five per cent gives seventy two point five billion.
- Market risk is eight billion modelled against ten standardised, which floors at seven point two five, so eight stays.
- Operational risk is ten on both sides.
- The sum is ninety point five billion, too high.
- The test is applied to total risk weighted assets, giving eighty seven.

## 27 Phasing the floor in

*Fenwick: S-TRWA $120bn, U-TRWA $80bn. Floor rises in steps ($bn)*

| Floor step | Floor | RWA used |
|---|---|---|
| 50% and 55% | 60 and 66 | 80: models |
| 60% and 65% | 72 and 78 | 80: models |
| 70% | 84 | 84: floor |
| 72.5%, final | 87 | 87: floor |

IN THE LESSON

- The floor did not arrive at full strength.
- It is phased in, starting at fifty per cent of S T R W A and rising in steps of five points to seventy per cent, then to the final seventy two point five per cent.
- Look at Fenwick, with the standardised figure of one hundred and twenty billion and the modelled figure of eighty.
- At fifty per cent the floor is sixty, and at fifty five per cent it is sixty six, so the models win.
- At sixty per cent it is seventy two, and at sixty five per cent seventy eight, still below eighty.
- At seventy per cent the floor is eighty four, above eighty, so it binds for the first time.
- At the final seventy two point five per cent it is eighty seven.

## 28 Permanent, and a replacement for the old floor

- Permanent: the phase-in is a path, not an exit
- Replaces the Basel II floor, set against Basel I
- Now set against more risk-sensitive standardised rules
- A backstop, not a target
- Bites where models stray far from the standardised view

IN THE LESSON

- Three more facts about the floor.
- First, it is permanent.
- The phase in is a path to the final level, not a sign that the floor will go away.
- Second, it replaces the old floor from Basel two, which was set against Basel one, a framework that was by then very out of date and was not risk sensitive.
- The new floor is set against the revised standardised approaches, which are themselves more risk sensitive, so the backstop is more meaningful.
- Third, the floor is a backstop, not a target.
- Where models stay close to the standardised view, they still set the number.
- The floor bites only where models stray far from the standardised view, which is exactly where variability was worst.

## 29 Mistakes to avoid

- Capital is not redefined: RWA is
- Models curtailed, not abolished
- 72.5% multiplies S-TRWA, not the bank's own RWA
- Floor on total RWA, not risk type by risk type
- Floor is permanent; 50% was only the start

IN THE LESSON

- Let us gather the traps from the whole lesson.
- First, the reforms do not redefine capital.
- They change how risk weighted assets are measured, so the effect falls on the denominator, and ratios fall for many banks.
- Second, internal models are curtailed, not abolished.
- They remain for much of credit risk and for market risk, though they are gone for C V A and operational risk.
- Third, seventy two point five per cent multiplies the standardised figure, not the bank's own figure.
- Fourth, the floor applies to total risk weighted assets, not risk type by risk type.
- Fifth, the floor is permanent, and fifty per cent was only its starting point.

## 30 Try three quick questions

1. Modelled RWA $50bn; standardised $80bn. RWA with the full floor?
   **Answer:** 72.5% × 80 = 58 > 50, so $58bn.
2. G-SIB surcharge 2%. Leverage ratio requirement with the buffer?
   **Answer:** Buffer 50% × 2% = 1%. 3% + 1% = 4%.
3. Corporate with revenue of €800m. Advanced IRB allowed?
   **Answer:** No: above €500m, so foundation IRB at most.

**IN THE LESSON**

- Now try three quick questions.
- Pause the video, think, then listen to the answers.
- Question one.
- A bank's modelled risk weighted assets are fifty billion dollars, and the standardised approaches would give eighty billion.
- With the floor fully phased in, what risk weighted assets does it report?
- Seventy two point five per cent of eighty is fifty eight billion, which is above fifty, so it reports fifty eight billion dollars.
- Question two.
- A global systemically important bank has a risk based surcharge of two per cent.
- What leverage ratio must it meet, including the buffer?
- The buffer is half of two per cent, one per cent, so it needs three plus one, which is four per cent.
- Question three.
- A corporate borrower has revenue of eight hundred million euros.
- Can the bank use advanced I R B for it?
- No.
- Revenue is above five hundred million euros, so foundation I R B at most.