CHARTA LEARNING · LESSON NOTES

Anatomy of the Great Financial Crisis of 2007-2009

FRM Part I

1 A story: the house, the loan and the chain of hands

- A borrower takes a house loan with a tiny deposit
- A broker sells the loan on, and is paid per loan
- The loan is pooled, sliced and sold worldwide
- Banks fund it with very short borrowing, rolled daily

IN THE LESSON

- Picture a family in the mid two thousands buying a house with almost no deposit.
- The loan comes from a broker who is paid for every loan signed, and who sells it on within weeks.
- It is pooled with thousands of others and cut into slices that are sold to investors around the world.
- A rating agency, paid by the seller, stamps the safest slices as top quality.
- A bank funds its holding by borrowing for a few days at a time, again and again.
- Everyone in the chain was paid for keeping it moving, and almost nobody was paid to ask whether the family could really repay.
- When house prices stopped rising, the chain pulled tight everywhere at once.

2 From housing boom to first cracks

- US housing and mortgage boom peaks around 2006
- 2007: subprime defaults rise; 2 Bear Stearns funds fail
- 9 Aug 2007: BNP Paribas suspends redemptions in 3 funds
- Cannot value US mortgage assets; interbank freeze

IN THE LESSON

- The crisis grew out of a boom in United States housing and mortgage lending that peaked around two thousand and six.
- The first visible signs came in two thousand and seven.
- Defaults on subprime mortgages, the loans to weaker borrowers, began to rise, and two hedge funds run by Bear Stearns, which held mortgage related securities, collapsed.
- On the ninth of August two thousand and seven, the French bank BNP Paribas suspended withdrawals from three of its funds because it could not value their American mortgage assets.
- That event is often used as the marker for the start of the freeze in interbank lending, because banks suddenly doubted each other and held back their cash.

3 The major events in order

Key dates of the crisis

When	Event
Aug 2007	BNP Paribas halts redemptions, 3 funds
Sep 2007	Northern Rock retail run
Mar 2008	Bear Stearns sold to JPMorgan Chase
Sep 2008	Fannie, Freddie, Lehman, AIG, Reserve
Oct 2008	TARP: USD 700 billion authorised

IN THE LESSON

- Now the sequence of the main events.
- It began in August two thousand and seven, when B N P Paribas suspended redemptions in three funds.
- In September two thousand and seven, the British lender Northern Rock suffered a run by ordinary depositors.
- In March two thousand and eight, Bear Stearns was sold to JPMorgan Chase, with support from the Federal Reserve.
- In September two thousand and eight came the biggest shocks.
- The mortgage giants Fannie Mae and Freddie Mac were placed in conservatorship, meaning government control.
- Then on the fifteenth of September, Lehman Brothers filed for bankruptcy.
- The very next day, the insurer A I G needed rescue and the Reserve Primary money market fund was hit by losses.
- In October, the United States authorised T A R P, a rescue programme of up to seven hundred billion dollars.

4 Why Lehman was the turning point

- Before: a credit and liquidity squeeze
- 15 Sep 2008: Lehman files for bankruptcy
- Next day: AIG and the Reserve Primary fund are hit
- Result: a global systemic crisis

IN THE LESSON

- Until September two thousand and eight, officials had often found a way to rescue or sell a failing institution.
- Bear Stearns had been sold with support.
- Then Lehman Brothers was allowed to file for bankruptcy, and the effect was immediate.
- Lenders realised that even a very large firm might not be saved, so they pulled back from everyone.
- The next day, a famous money market fund lost value, and the insurer A I G required support.
- Credit markets seized up worldwide.
- Before Lehman, the problem was mainly a squeeze on credit and liquidity, meaning the ability to borrow and to sell assets quickly.
- After Lehman it became a global systemic crisis, where the failure of one part threatens the whole system.

5 The build up, part one: cheap money

- Cheap money: Fed rate 1%, 2003-04; hunt for yield
- Large foreign savings kept long-term yields down
- Years of rising house prices: mortgage losses seemed rare

IN THE LESSON

- Now, why did it happen?
- The build up rested on several factors that reinforced each other, and no single cause is the answer.
- First, cheap money.
- After the recession of two thousand and one, the Federal Reserve held interest rates very low, at one per cent from mid two thousand and three to mid two thousand and four.
- Second, large savings from abroad flowed into the United States and kept long term yields down.
- When borrowing is cheap, investors who want a decent return must search for yield, meaning they reach for riskier assets that pay a little more.
- Third, house prices rose for years.
- That taught lenders and investors that mortgage losses were rare, which made risky lending look safe.

6 The build up, part two: weak incentives

- Originate-to-distribute: lenders sell, standards fall
- Little capital held against off-balance-sheet vehicles
- Bonuses rewarded short-term volume, not loan quality
- Leverage magnified everything, up and down

IN THE LESSON

- The next group of factors concerns how the financial system was organised.
- Fourth, a model called originate to distribute.
- Lenders made loans and sold them on through securitisation, so they no longer held the risk, and underwriting standards fell.
- Underwriting just means checking that a borrower can repay.
- Fifth, banks held little capital against off balance sheet vehicles, which were funding arms kept outside the main accounts.
- Sixth, pay.
- Bonuses rewarded short term volume, and not the long term quality of the loans.
- Seventh, leverage, meaning the use of borrowed money.
- Leverage magnified every gain on the way up, and every loss on the way down.

7 Example 1: leverage wipes out thin equity

Illustration: assets 100, debt 95, equity 5; assets then fall 5%

Equity share of assets	5 ÷ 100	**5%**
Loss on assets	5% × 100	**5**
Equity left	5 − 5	**0**
Thicker bank: 20 equity	20 − 5 = 15 left	**Survives**

IN THE LESSON

- Let us see how leverage works with an illustration.
- A bank holds one hundred of assets, financed by five of its own money, called equity, and ninety five of borrowing.
- Equity is five per cent of assets.
- Now suppose the assets fall in value by five per cent, a loss of five.
- The borrowing is still ninety five, but the assets are worth only ninety five, so equity is zero.
- The bank is wiped out by a five per cent fall.
- Compare a bank with twenty per cent equity.
- The same five per cent fall costs five and leaves fifteen of equity, so it survives.
- Thin equity means a small fall in asset values is fatal, and that is why leverage magnifies losses.

8 Subprime mortgages: loans needing rising prices

- Weak credit records, high loan-to-value, little paperwork
- Low teaser rate for two years, then it resets higher
- Repayment relied on refinancing as house prices rose
- Prices stop rising, so refinancing fails and defaults jump

IN THE LESSON

- A subprime mortgage was a loan to a borrower with a weak credit record.
- Often the loan was almost as large as the house, a high loan to value ratio, with little documentation of income.
- Many carried a low teaser rate for the first two years that then reset higher.
- This design had a hidden assumption.
- Because the payment would jump, repayment relied on refinancing, taking a new loan, as the house price rose.
- Rising prices gave the borrower new equity to borrow against, so everything worked.
- If house prices flattened or fell, refinancing became impossible, the higher payment arrived, and defaults rose.
- The loan only worked in a world of rising prices.

9 Example 2: prices fall, the loan is underwater

Illustration: house bought at $200,000 with a $200,000 loan

Prices rise 10%	house worth $220,000	**+$20,000 equity**
Result	can refinance	**Loan survives**
Prices fall 10%	house worth $180,000	**−$20,000 equity**
Result	cannot refinance	**Default likely**

IN THE LESSON

- Here is an illustration with round numbers.
- A family buys a house for two hundred thousand dollars with a loan of two hundred thousand, so there is no deposit.
- Suppose prices rise ten per cent.
- The house is worth two hundred and twenty thousand, so the family has twenty thousand of equity and can refinance before the teaser rate ends.
- Now suppose prices instead fall ten per cent.
- The house is worth one hundred and eighty thousand, but the loan is still two hundred thousand.
- The family has negative equity of twenty thousand, and cannot refinance.
- Walking away from the loan may even be sensible.
- The same loan is safe or toxic depending on one thing, the direction of house prices.

10 Securitisation and tranching

- Loans pooled into mortgage-backed securities
- Pool cut into tranches: equity, mezzanine, senior
- Losses hit equity first, then mezzanine, then senior
- Attachment point: where a tranche starts to lose

IN THE LESSON

- Next, what happened to the loans.
- Thousands of mortgages were pooled and turned into mortgage backed securities, which are bonds paid from the pool's repayments.
- The pool was then tranched, which means cut into slices called tranches, ranked by who absorbs losses first.
- The lowest slice is the equity tranche.
- It takes the first losses, pays the highest return, and is the riskiest.
- Above it sits the mezzanine tranche.
- At the top sits the senior tranche, which is hit only after the lower slices are used up.
- Each tranche has an attachment point, the pool loss where it starts to lose, and a detachment point, where it is completely lost.
- The distance between them is its width.

11 How much does each tranche lose?

Tranche loss = (pool loss − attachment point) ÷ width
capped between 0% and 100%

Pool loss	Loss on the whole pool, in %
Attachment point	Pool loss where tranche is hit
Tranche width	Detachment minus attachment point
Tranche loss	Share of the tranche that is lost

IN THE LESSON

- Here is the rule for the loss on a tranche.
- Take the loss on the whole pool, subtract the tranche's attachment point, and divide by the tranche's width.
- If the pool loss is below the attachment point, the answer is negative, so we cap it at zero per cent.
- If the pool loss passes the detachment point, the answer is above one hundred per cent, so we cap it at one hundred per cent.
- Between the two, each tranche is hit in proportion to how far the pool loss has passed its attachment point.
- Notice that a thin tranche, with a small width, moves from untouched to wiped out over a small range of pool losses.
- That is the root of the amplification we are about to see.

12 Example 3: a pool of 100 in three tranches

Illustration: equity 0-5, mezzanine 5-15, senior 15-100

Pool loss 4%	equity (4 − 0) ÷ 5	**80% lost**
Pool loss 10%	equity gone; mezz (10 − 5) ÷ 10	**50% lost**
Pool loss 32%	mezz gone; senior (32 − 15) ÷ 85	**20% lost**

IN THE LESSON

- Let us apply the rule.
- Imagine a pool of one hundred of mortgages with three tranches.
- The equity tranche covers pool losses from zero to five, a width of five.
- The mezzanine covers five to fifteen, a width of ten.
- The senior covers fifteen to one hundred, a width of eighty five.
- First, a pool loss of four per cent.
- Equity loses four over five, eighty per cent, and the others lose nothing.
- Second, a pool loss of ten per cent.
- Equity is gone, and mezzanine loses ten minus five, over ten, which is fifty per cent.
- Third, a pool loss of thirty two per cent.
- Mezzanine is gone, and senior loses thirty two minus fifteen, over eighty five, exactly twenty per cent.

13 CDOs: repeating the trick

- A CDO pools securities, not loans, then tranches again
- Unsold mezzanine slices repackaged into ABS CDOs
- Most new slices were rated AAA
- Ratings assumed defaults would not move together

IN THE LESSON

- A collateralised debt obligation, or C D O, repeats the process.
- Instead of a pool of mortgages, its pool is made of securities, and it is sliced again into tranches.
- Banks found that the mezzanine tranches of mortgage securities were hard to sell, because they were the riskier part.
- So many of them were repackaged into new pools called A B S C D Os, and sliced again.
- The surprise was the rating.
- Most of the new slices, often the large majority, were rated at the very top level, triple A, even though the raw material was the risky middle layer.
- This looked like magic, but the ratings relied on assumptions about how those pools would behave together.

14 Example 4: a small loss reaches the safe slice

Illustration: a CDO built from mezzanine tranches of pools that each lose 10%

Underlying pool loss	each pool	**10%**
Each mezzanine tranche	(10 − 5) ÷ 10	**50% lost**
CDO pool loss	all mezzanines alike	**50%**
CDO mezzanine 5-20	(50 − 5) ÷ 15 > 100%	**100% lost**
CDO senior 20-100	(50 − 20) ÷ 80	**37.5% lost**

IN THE LESSON

- Now follow a loss through two layers.
- Take the pool from the last example and suppose its loss is ten per cent.
- Its mezzanine tranche then loses fifty per cent.
- Now imagine a C D O built from mezzanine tranches of many pools, all hit the same way, because all depend on the same housing market.
- The C D O pool loses fifty per cent.
- Say its tranches are equity zero to five, mezzanine five to twenty, and senior twenty to one hundred, a width of eighty.
- The equity and mezzanine are wiped out.
- The senior, which was rated triple A, loses fifty minus twenty, over eighty, which is thirty seven and a half per cent.
- A ten per cent loss on ordinary mortgages destroyed more than a third of a supposedly safe slice.

15 The key point: correlation and amplification

- All loans depended on one housing market
- Defaults were highly correlated: they came together
- Small pool losses wiped out mezzanine tranches
- Repackaging amplified the loss up to AAA senior slices

IN THE LESSON

- Why did the safe slices fail?
- The answer is correlation, meaning how much defaults move together.
- If the mortgages in a pool were spread across unrelated regions, defaults would be rare and independent, and a pool loss above a few per cent would be extremely unlikely.
- But all of these loans depended on the same housing market, and many shared the same design of teaser rates and refinancing.
- When prices turned, defaults came together.
- High correlation means bad outcomes arrive in clusters, and tranching is very sensitive to clusters.
- So small pool losses wiped out mezzanine tranches, and then supposedly safe senior tranches.
- Remember the two words: correlation and amplification.
- Each layer of repackaging magnified the original problem.

16 The players: brokers, lenders, rating agencies

- Brokers and lenders: paid per loan, so little checking
- Rating agencies: paid by the issuers they rate
- Models: low default correlation, short price history
- Arrangers could shop around for the best rating

IN THE LESSON

- Let us now compare the groups involved, since each had its own incentive problem.
- Mortgage brokers and lenders were paid per loan originated, and could sell the loan on, so they had little reason to check the borrower.
- Rating agencies were paid by the issuers whose securities they rated, which creates a conflict of interest.
- Their models assumed low default correlation, and used house price data covering only a short, calm period.
- Arrangers could also go rating shopping, meaning they took their business to whichever agency would give the best rating.
- Investors then leaned on those ratings in place of their own analysis.
- Each party followed its incentive, and the combination was fragile.

17 The players: intermediaries and banks

- Investment banks: structured, sold, earned fees
- They kept super-senior tranches or warehoused risk
- Banks backed conduits and SIVs with liquidity lines
- When funding stopped, the risk returned to the banks

IN THE LESSON

- Financial intermediaries, such as investment banks, structured and sold the securities and earned fees on volume.
- They often kept the super senior tranches, the top slices thought to be nearly risk free, or warehoused unsold risk while a deal was being assembled.
- Banks originated and held loans, and also sponsored conduits and structured investment vehicles.
- These were off balance sheet funds that borrowed short term to hold longer term securities.
- The banks gave them liquidity backstops, promises to provide cash if the vehicles could not borrow.
- When funding markets stopped, those promises were called.
- The risk that banks believed they had sold came straight back onto their own balance sheets.

18 Match each party to its incentive and its risk

Incentive and how the risk came back

Party	Incentive → how risk returned
Brokers and lenders	Fee per loan → early defaults
Rating agencies	Paid by issuer → wrong AAA ratings
Intermediaries	Volume fees → unsold tranches
Banks	Backstops → vehicles back on books

IN THE LESSON

- Here is the summary to be able to give.
- For each party, name the incentive and the way the risk came back.
- Brokers and lenders earned fees per loan, so they did not mind weak underwriting, and the risk returned as mortgages that defaulted early.
- Rating agencies were paid by issuers and used optimistic models, so their top ratings were wrong, and losses on supposedly safe slices followed.
- Intermediaries earned fees on volume, and kept or warehoused risk, so they were stuck with unsold securities.
- Banks sponsored vehicles with backstops, so when short term funding vanished, the vehicles returned to the bank balance sheet.
- In every case, the incentive pointed away from care.

19 Short-term wholesale funding: a fragile base

- ABCP, repos and money market funds
- Short-term borrowing financing long-term assets
- It must be rolled over often, sometimes daily
- If lenders refuse to roll, the borrower faces a run

IN THE LESSON

- Now the funding side.
- Before the crisis many banks, conduits and securities dealers financed long term assets with short term wholesale funding, meaning borrowing from other financial firms and not from ordinary depositors.
- There were three main forms.
- Asset backed commercial paper is short term debt issued against a pool of assets.
- Repurchase agreements, or repos, are loans of cash against collateral.
- And borrowing from money market funds.
- This funding must be rolled over, meaning renewed, often, sometimes every day.
- It is cheap while everyone is confident, but it is dangerous.
- If lenders simply decline to renew, a borrower holding assets that take years to repay has to find cash immediately, and that is a run.

20 Repo haircuts and maximum leverage

Haircut = (collateral − cash lent) ÷ collateral
Maximum leverage = 1 ÷ haircut

Collateral value	Market value of the assets pledged
Cash lent	Cash the lender actually pays out
Haircut	Safety margin kept by the lender
Maximum leverage	Largest assets-to-equity multiple

IN THE LESSON

- In a repo, a borrower hands over collateral and receives cash.
- The lender does not lend the full value, but keeps a safety margin called the haircut.
- The haircut is the collateral value minus the cash lent, divided by the collateral value.
- Suppose collateral is worth one hundred and the lender gives ninety five of cash.
- The haircut is five divided by one hundred, which is five per cent.
- The haircut also sets how much leverage the borrower can reach.
- Maximum leverage equals one divided by the haircut.
- A five per cent haircut allows leverage of twenty times.
- Now notice what a rise in the haircut does.
- A ten per cent haircut allows only ten times.
- Lenders can squeeze borrowers without ever refusing a loan.

21 Example 5: a higher haircut forces sales

Illustration: assets 100, repo debt 95, equity 5; haircut rises from 5% to 10%

Old haircut and leverage	5% -> 1 ÷ 0.05	**20 times**
New haircut and leverage	10% -> 1 ÷ 0.10	**10 times**
Cash lendable on 100	100 × (1 − 0.10)	**90**
Assets equity can carry	5 ÷ 0.10	**50, so sell 50**

IN THE LESSON

- Let us put numbers to it.
- A bank holds one hundred of assets, financed with ninety five of repo borrowing and five of equity.
- The haircut is five per cent, leverage twenty times.
- Now doubts rise, and lenders raise the haircut to ten per cent.
- With a ten per cent haircut, the lenders will only advance ninety on those same assets.
- The lenders advance only ninety against one hundred of assets, so the bank is short by five of cash.
- Selling just five does not solve it, because the haircut applies to the assets that remain.
- With equity of five and a ten per cent haircut, assets can be at most five divided by point one, which is fifty.
- The bank must sell fifty of assets, half of its holdings, and repay fifty of borrowing.
- Nothing changed in the assets.
- Only confidence changed.

22 Example 6: the loss and margin spiral

Illustration continued: after selling 50, assets 50, debt 45, equity 5

Price falls 4%	50 × 0.96 = 48	**Assets 48**
Equity after the fall	48 − 45	**3**
Assets equity can carry	3 ÷ 0.10	**30**
Further forced sale	48 − 30	**Sell 18**

IN THE LESSON

- The story does not stop there.
- The bank sells fifty of assets at the going price to repay fifty of debt.
- Now it holds fifty of assets, forty five of debt and five of equity, which meets the ten per cent haircut.
- But forced selling by many banks pushes the market price down.
- Say the price of the remaining assets falls four per cent.
- They are now worth forty eight, so equity drops to three.
- With a ten per cent haircut, three of equity supports only thirty of assets.
- The bank must sell eighteen more, which pushes prices down again, and triggers more margin calls elsewhere.
- This is a loss and margin spiral: falling prices cause losses, losses force sales, and sales cause falling prices.

23 Systemic risk and the LIBOR-OIS spread

- Forced sales cut prices of similar assets everywhere
- Firms with no subprime assets still suffered
- Systemic risk: shocks pass through prices and funding
- LIBOR-OIS spread widened: banks distrusted each other

IN THE LESSON

- This spiral explains why the crisis spread to firms that held no subprime assets at all.
- Forced selling lowers prices of everything that looks similar, so institutions with perfectly good assets still suffer losses and margin calls.
- That is systemic risk: a shock passes from one institution to others through prices, funding and distrust.
- The stress also showed up in a market gauge, the L I B O R minus O I S spread.
- LIBOR was the rate at which banks said they could borrow from each other without security, and the spread usually compares the three month rate with the matching three month O I S.
- O I S, the overnight index swap rate, reflects expected central bank policy rates and has very little credit risk.
- When banks distrusted one another, the gap between them widened sharply, from August two thousand and seven, and again after Lehman.

24 Central banks: rate cuts to lender of last resort

- Fed target rate: 5.25% until Sep 2007
- Cut to a range of 0 to 0.25% by Dec 2008
- Facilities to lend against wider collateral
- Term Auction Facility reduced discount window stigma

IN THE LESSON

- Now the response.
- Central banks first acted as lenders of last resort, which means they lend to solvent institutions that cannot borrow elsewhere.
- The Federal Reserve cut its target rate, which stood at five and a quarter per cent until September two thousand and seven, to a range of zero to a quarter of one per cent by December two thousand and eight.
- It also created facilities to lend against a wider range of collateral.
- The Term Auction Facility reduced the stigma of the discount window, the normal route for emergency borrowing, which banks had avoided for fear of looking weak.
- Lending then extended to primary dealers, and later to money market funds and commercial paper issuers.

25 Central banks: swap lines, non-banks and quantitative easing

- Dollar swap lines: foreign central banks on-lend dollars
- Emergency lending to non-banks (Bear Stearns, AIG)
- At zero rates: large-scale asset purchases (QE), late 2008
- Rate cuts alone did not repair impaired funding markets

IN THE LESSON

- The Fed went further.
- It opened dollar swap lines with foreign central banks, which then lent dollars on to their own banks, because banks abroad also had large dollar funding needs.
- It used emergency powers to lend to non banks, as in the rescue of Bear Stearns and of A I G.
- And once rates were close to zero, it began large scale asset purchases, known as quantitative easing, from late two thousand and eight.
- Other central banks also cut rates and widened the collateral they would accept.
- The key lesson is that rate cuts alone did not repair damaged funding markets.
- The central bank had to supply liquidity directly, to the specific places where it had dried up.

26 Four mistakes to avoid

- 1. No single cause: name factors and how they interact
- 2. Tranche loss = (pool − attachment) ÷ width, capped
- 3. Ratings failed because defaults were correlated
- 4. Max leverage = 1 ÷ haircut; higher haircut forces sales

IN THE LESSON

- Before we finish, four common mistakes.
- One.
- Naming a single cause.
- The right answer lists several factors and shows how they reinforced one another.
- Two.
- Mixing up the tranche formula: subtract the attachment point, divide by the width, and cap between zero and one hundred per cent.
- Three.
- Forgetting correlation.
- Rated slices failed because the loans defaulted together, not just because they were risky.
- Four.
- Treating the haircut and leverage the wrong way round.
- Maximum leverage is one divided by the haircut, so a higher haircut means lower leverage and forced selling.
- Also remember that Lehman turned a credit squeeze into a systemic crisis, and that rate cuts alone did not fix it.

27 Recap: the crisis in one chain

Tranche loss = (pool loss − attachment) ÷ width
Haircut = (collateral − cash) ÷ collateral; Max leverage = 1 ÷ haircut

Pool loss	Loss on the whole pool, in %
Tranche width	Detachment minus attachment point
Haircut	Safety margin kept by the lender
Maximum leverage	Largest assets-to-equity multiple

IN THE LESSON

- Let us recap.
- The build up combined cheap money, rising house prices, weak lending standards from originate to distribute, thin capital and heavy leverage.
- Subprime loans relied on rising prices.
- They were pooled and tranched, and a tranche loses in proportion to how far the pool loss passes its attachment point.
- Repackaging mezzanine tranches into C D Os, rated mostly triple A, meant that correlated defaults wiped out even senior slices.
- Brokers, rating agencies, intermediaries and banks each followed incentives that led them away from care.
- Short term funding then ran, as haircuts rose and spirals formed, and Lehman made it systemic.
- Central banks answered with rates, facilities, swap lines and quantitative easing.

28 Try three quick questions

1. Mezzanine 5%-15%; pool loses 8%. What share of the tranche is lost?
   Answer: (8 − 5) ÷ 10 = 30%.
2. Repo: $92 cash on $100 collateral. Haircut and maximum leverage?
   Answer: Haircut 8%; leverage 1 ÷ 0.08 = 12.5 times.
3. Why did Lehman's failure change the crisis?
   Answer: A big firm was left to fail, lenders pulled back, and a squeeze became systemic.

IN THE LESSON

- Now try three questions yourself.
- Pause after each one.
- Question one.
- A pool has a mezzanine tranche that attaches at five per cent and detaches at fifteen per cent.
- The pool loses eight per cent.
- What share of the mezzanine is lost?
- Eight minus five, over ten, is thirty per cent.
- Question two.
- A repo lender advances ninety two on collateral worth one hundred.
- What is the haircut, and the maximum leverage?
- The haircut is eight per cent, so leverage is twelve and a half times.
- Question three.
- Why did the Lehman failure change the crisis?
- Officials let a very large firm fail, so lenders pulled back from everyone, and a credit and liquidity squeeze became a global systemic crisis.