The 2008 Financial Crisis: Hows, Whys and Wheretos

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The popular story (fable)

- Seizing on opportunities presented by a housing bubble, greedy US bankers forced mortgages onto poor and unsophisticated borrowers who couldn’t really afford them.

- Knowing that these loans were low-quality, the GBs packaged them up and flogged them off to unwary, but also greedy, bankers and fellow-travellers around the world.

- When bubble burst, PUBs defaulted and UGBs discovered they’d been sold pups. PUBs and UGBs went bust, credit markets shut down, and the economy ground to a halt.

- Moral: markets have failed and it’s time for tougher rules on GBs to make sure this never happens again.
A brief history of subprime lending

- 1992-93: US Congress begins pressurising banks & others to make more mortgage loans to low-income borrowers. (But forerunners aplenty)

- 1998: First ‘subprime’ crisis. 6 lenders were bankrupted and many others forced to merge.


- 1998-2005: Subprime mortgages come to capture 20% of total market. (US house prices rising by 10%/year)

- May 2004-May 2006: Federal Reserve raises interest rates by 4pp. (US house prices drop by 27% over next 30 months)

Last quarter of 2006: Mortgage Banker Association reports that 13.3% of subprime mortgages in “difficulty”.

First half of 2007: Failures of minor mortgage originators with exposure to subprime loans. Rumblings of problems at major banks.

Second Half of 2007:
- Ratings agencies downgrade subprime-related assets.
- Bank runs in US and UK.
- Repeated large writedowns by major US banks and financial firms.
- By December, ABX index falls to 20% of par value.
A brief history cont.

- March 2008: Bear Sterns collapses; bought for $2/share by JP Morgan.

- September 2008: Chickens really come home to roost
  - Federal takeover of Freddie Mac and Fannie Mae
  - Merrill Lynch sold to Bank of America
  - G Boyle puts Wellington house on the market

- 15 September 2008: Lehman Brothers files for bankruptcy protection.

- 17 September 2008: Federal Reserve bails out insurer Amer. Intnl. Group
  - Interbank spreads more than triple - credit markets seize up.

- You know the rest...

  BUT HOW DID IT ALL COME TO THIS?
What is a subprime mortgage?

- Subprime mortgage = housing loan made to borrowers characterised by at least one of:
  - low or undocumented income
  - no funds for deposit
  - poor credit record

- But such borrowers are risky. Lenders usually charge a higher interest rate as compensation for risk, but then such borrowers wouldn’t be able to afford the loan.

- The ‘solution’ to this conundrum was what ultimately brought the subprime pack of cards crashing down.
Getting high-risk borrowers into home loans

- Assume that house prices will continue to rise (FATAL FLAW 1)
  - allow borrowers to build up equity ⇒ lower risk

- So issue two-step loans:
  (i) Initial period (usually 2 or 3 years) at ‘low’ interest rate;
  (ii) after reset date, remainder of loan is at higher interest rate.
  e.g., 2/28 is a 30 year loan with first 2 years on a so-called ‘teaser’
  rate (low) and 28 years on a much higher floating rate.

- Step (ii) essentially forces borrowers to refinance at reset date. But
  banks protected - *so long as house prices have risen.*
What goes up eventually comes down...
... as we’ve long known
Consequences of the burst ‘bubble’

- Many subprime borrowers moved to ‘negative equity’ in their houses and couldn’t refinance even if they wished to do so.

- Defaults and foreclosures had a further depressing effect on house prices, which in turn forced more mortgage-holders into difficulties. And so on...

- Although painful for a lot of people, this wouldn’t have led to a systemic crisis. Like 1998.

BUT UNLIKE 1998, SUBPRIME MORTGAGES WERE THIS TIME INEXTRICABLY ENTWINED WITH CAPITAL MARKETS
Banks and other lenders moved subprime loans off balance sheets by a process known as securitisation - packaging loans together, transforming them into securities, and selling them off to investors.

One of the great financial innovations
- creates additional savings vehicle
- diversifies bank-specific risks
- allows banks to finance additional investment
- previously (and successfully) applied to prime mortgages, student loans, credit card receivables.

Unsurprisingly banks and other mortgage originators were attracted to subprime mortgage securitisation.
### Subprime Mortgage Backed Securities (MBS) Issuance

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Mortgage Originations (Billions)</th>
<th>Subprime Mortgage Originations (Billions)</th>
<th>Subprime Share in Total Originations (% of dollar value)</th>
<th>Subprime Mortgage Backed Securities (Billions)</th>
<th>Percent Subprime Securitized (% of dollar value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>$2,215</td>
<td>$190</td>
<td>8.6%</td>
<td>$95</td>
<td>50.4%</td>
</tr>
<tr>
<td>2002</td>
<td>$2,885</td>
<td>$231</td>
<td>8.0%</td>
<td>$121</td>
<td>52.7%</td>
</tr>
<tr>
<td>2003</td>
<td>$3,945</td>
<td>$335</td>
<td>8.5%</td>
<td>$202</td>
<td>60.5%</td>
</tr>
<tr>
<td>2004</td>
<td>$2,920</td>
<td>$540</td>
<td>18.5%</td>
<td>$401</td>
<td>74.3%</td>
</tr>
<tr>
<td>2005</td>
<td>$3,120</td>
<td>$625</td>
<td>20.0%</td>
<td>$507</td>
<td>81.2%</td>
</tr>
<tr>
<td>2006</td>
<td>$2,980</td>
<td>$600</td>
<td>20.1%</td>
<td>$483</td>
<td>80.5%</td>
</tr>
</tbody>
</table>

Subprime MBS Pitfalls

- Subprime mortgages packaged up by originators and sold to Trusts or ‘Special Purpose Vehicles’ (SPV)

- SPVs split these up into risk ‘tranches’, obtained a rating (usually ranging from AAA to BBB-) for each tranche, and sold these off as Mortgage Backed Securities (MBS) to investors (including other banks and financial firms).

- Investors received claim on interest, principal and prepayment cashflows

BUT

- Subprime MBS had some nasty twists:
  - very concentrated risk
  - questionable whether any were AAA or anything like it
  - difficult to value because of originator refinancing option, prepayment penalty, and lack of data - esp. on default probabilities
  - very sensitive to house prices
MBS house price sensitivity
Another securitisation layer - CDOs

- Unlikely that subprime MBS could have wrought financial chaos on their own.

- But many MBS tranches were repackaged and resold as Collateralized Debt Obligations (CDO) - essentially MBS on steroids!

- Typical CDO would split MBS cashflows across investors by category of cashflow and duration of entitlement.
Example CDO

- Investor A gets all interest payments from years 1-3
- Investor B gets all principal payments from years 1-3
- Investor C gets all interest payments from year 4
- Investor D gets all principal payments from year 4
- Investor E gets all interest payments from years 6-10
- Investor F gets all principal payments from years 6-10
- Investor G gets all interest payments from years 11-24
- Investor H gets all principal payments from years 11-24
- Investor I gets all interest payments from years 25-30
- Investor J gets all principal payments from years 25-30
- Investor K gets all prepayment penalties from years 1-15
- Investor L gets all prepayment penalties from years 16-30
- Investor M gets all early payments
Opaqueness of CDOs

- Byzantine complexity of CDOs made MBS valuation look like walk in the park. (FATAL FLAW 3)

- But many received high credit ratings, engendering false sense of security.

- Different claims to same cashflow stream put investors at odds with each other and encouraged loan foreclosure instead of renegotiation
And yet another layer - CDS

- CDO issuance limited to supply of MBS, which in turn was limited to subprime mortgage origination.

- Solution: issue ‘synthetic’ CDOs that provide exposure to subprime mortgages without being directly linked to any underlying asset.

- Usual synthetic CDO was a ‘credit default swap’ (CDS) - like an insurance policy against CDO/MBS default. But no need for the buyer to own the CDO/MBS.

- Some CDS buyers did so for genuine hedging reasons, but many positions were unrelated to underlying position. By 2006, subprime exposure was almost double MBS issuance!
The final straw

- CDOs and CDSs traded ‘over-the-counter’, not on a centralised exchange. (FATAL FLAW 4)

- When housing market turned south and ABX index fell sharply, nobody knew exactly where the bodies were buried.

- “If you have ten bottles of water and one is poisoned, but you don’t know which, no one drinks water” (Paul O’Neill)

- Extreme ‘lemons’ problem: no bank wanted to lend to another (or any other financial firm) because of the potential for hidden subprime exposure.
Four fatal flaws

1. Assumption that house prices would rise indefinitely.

2. Creation of securitisation vehicles that were extremely sensitive to house price movements.

3. Extreme difficulty - esp. in the absence of reliable default data - in valuing extraordinarily complex subprime-exposed securities.

4. OTC trading - opaque ownership of affected securities.

Without all four ‘fatal flaws’, housing market ructions couldn’t have led to a full-blown financial crisis.

WHAT PRODUCED THE FOUR FATAL FLAWS?
Financial Deregulation?

- Post-1980 financial deregulation did create new institutions that largely avoided regulatory oversight – hedge funds, private equity, SPVs and other off-balance-sheet conduits.

- BUT
  - victims, not culprits
  - counter-factual: foregone benefits massive
  - FMs had 236 regulators!
A failure of incentives?

- Mortgage originators and borrowers (securitisation)
- Depositors and banks (deposit insurance)
- Financial firm executives and activities of own firm (corporatisation and high remuneration)
- Ratings agencies and issuers (issuer-pays, advice function)
- Government and low-income borrowers
  - too easy to get into new loans
  - too easy to get out of distressed loans (‘jingle mail’)
Back to the beginning...

- “The road to hell is paved with good intentions”
  
  (Trad.)

- “The nine scariest words in the English language are: ‘I’m from the government and I’m here to help’.”
  
  (R Reagan)

A singular combination of policies, incentives and responses turned a backyard blaze into a forest fire.
What, if anything, should be done?

Boyle’s (Short) List

• Extend usual ‘enforceability’ of insurance policies to CDSs;

• Either expose ratings agencies to competition or allow investors to seek redress;

• Ensure all deposit insurance is properly risk-priced;