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# 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: Bank of America begins offering explicit 'subprime' loans. Others follow suit.
- 1998-2005: Subprime mortgages come to capture 20% of total market. (US house prices rising by 10%/year)
- May 2004-May2006: Federal Reserve raises interest rates by 4pp. (US house prices drop by 27% over next 30 months)

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# *A brief history cont.*

- 19 January 2006: ABX Index of subprime market begins trading. Trades at par throughout 2006.

- 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.

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- 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*

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- Assume that house prices will continue to rise (FATAL FLAW 1)

  - allow borrowers to build up equity $\Rightarrow$ lower risk

- So issue two-step loans:

  (i) Initial period (usually 2 or 3 years) at 'low' interest rate;

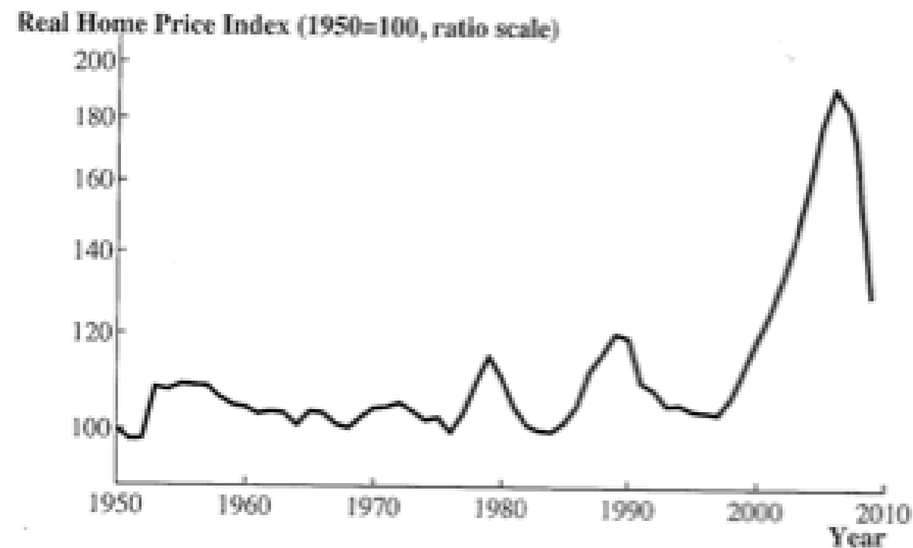
  (ii) after reset date, remainder of loan is at higher interest rate.

  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*.

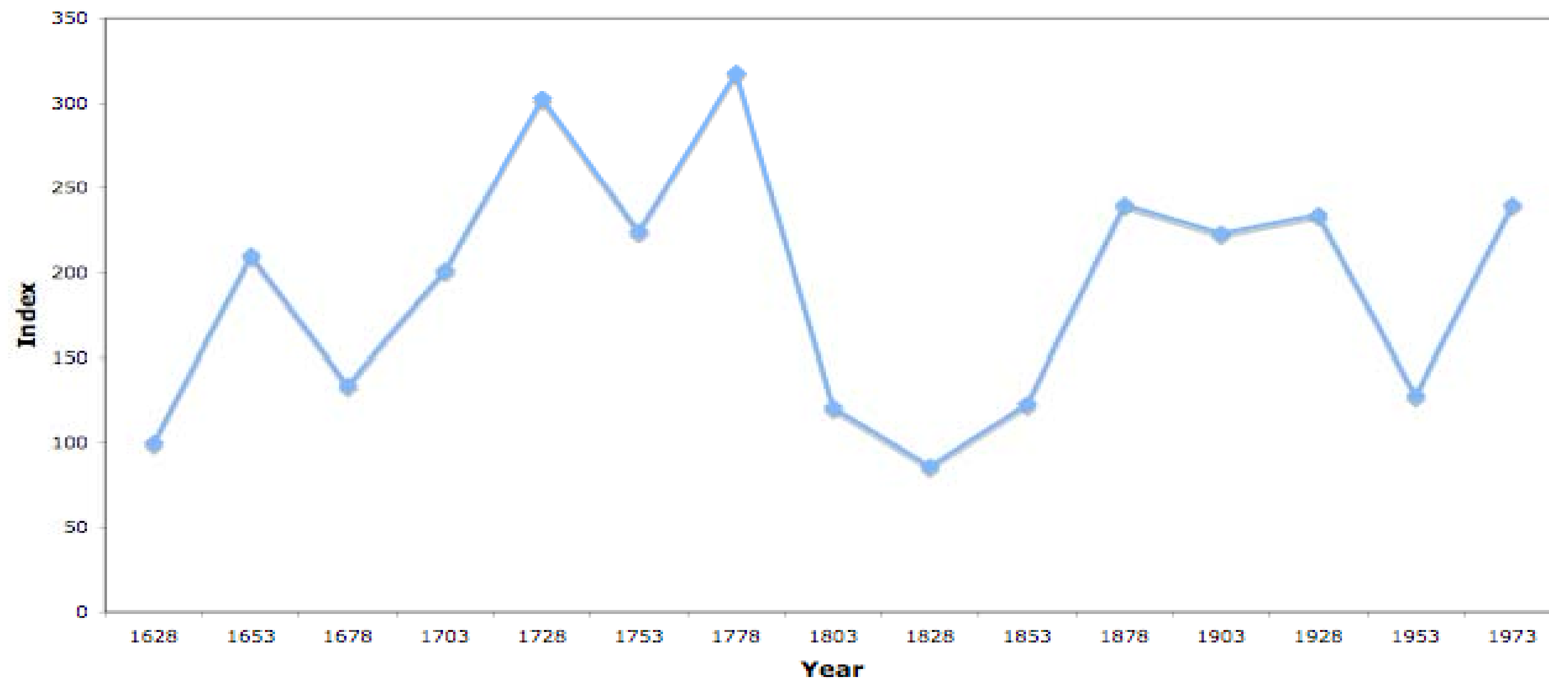
# *What goes up eventually comes down…*





# ... 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

# *SECURITISATION (FATAL FLAW 2)*



- 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

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**Mortgage Originations and Subprime Securitization**

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

Sources: Inside Mortgage Finance, The 2007 Mortgage Market Statistical Annual, Key Data (2006), Joint Economic Committee (October 2007).

# *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

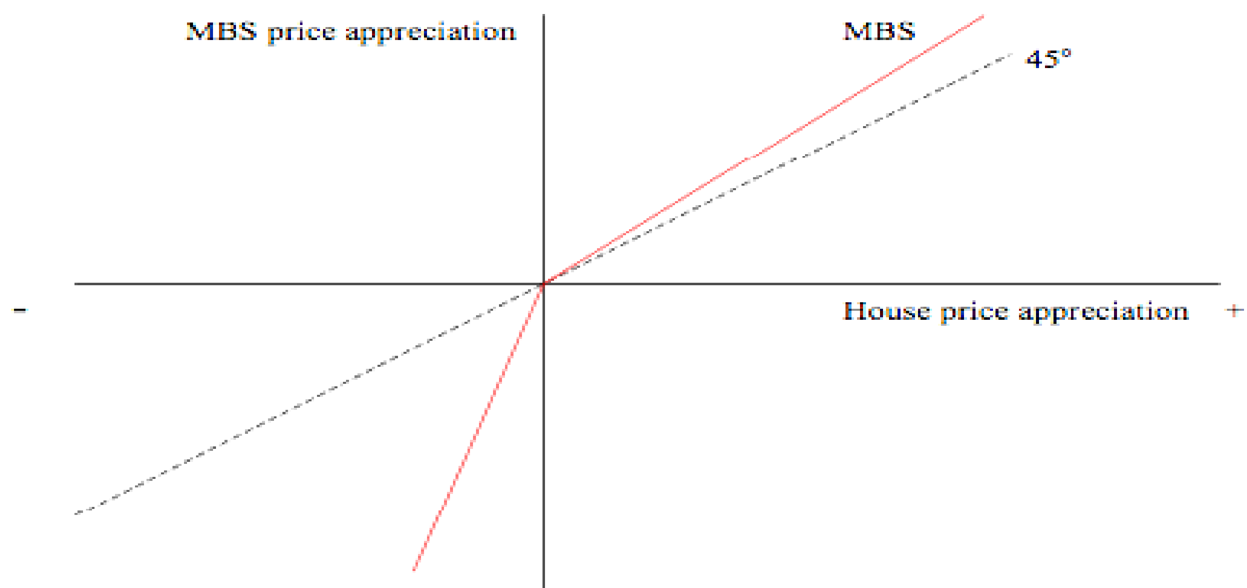
  - questionable whether any were AAA or anything like it

  - 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.

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# *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*

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- 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!

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# *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')

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## *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.**

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# *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;