Econ 133

Deciphering the Liquidity and Credit Crunch 2007 - 2008

Markus Brunnermeier, *Journal of Economics Perspectives* , Vol. 23, No. 1 pp. 77-100, Winter 2009

Today U.S. and world economy has not yet recovered from the crisis that began in 2007. For instance, unemployment rate is currently close to 10% and housing prices are falling again.

So, how did approximately **$500 billion** in mortgage losses in 2007-08 result in **$8 trillion** loss in U.S. stock market alone between October 2007 and 2008, not to mention the rest of the consequences for the U.S. and world economy?

The Stage:

1. Lax interest rate policy by the FED

2. Massive inflows of financial capital from Asian emerging economies

3. Afraid of deflation, FED did not try to burst the housing bubble

4. “Originate and distribute” banking model

Cheap Credit & Housing Boom

Mortgage brokers offered:

- Teaser Rates
- No-Documentation Mortgages
- Piggyback Mortgages
- NINJA loans

Housing Prices Could Only Rise?

- Assumed that a borrower could always refinance a loan using the increased value of the house
- Housing downturns have been a **regional** phenomena
- Assumed low cross-regional correlation in house prices generated ***false*** diversification benefit

The "Originate and distribute" Model

- To offload risk banks create CDOs
- Senior tranches receive AAA rating, sold to various investors (***false*** diversification benefit)
- Most junior tranche "toxic waste" held by issuing bank
- Buyers of CDOs also bought CDSs for protection

“Shadow” Banking System

- Off-balance-sheet investment vehicles (SIVs)
- SIVs sell short-term ABCP, backed by a pool of mortgages as collateral, invest in long-term
- Banks grant SIVs a “liquidity backstop”
- Maturity mismatch risk for banks **not visible on their balance sheets**
- Allowed banks to reduce the amount of capital to adhere to regulation (Basel I)

Unfolding of the Crisis:

Slow down in house-price increase

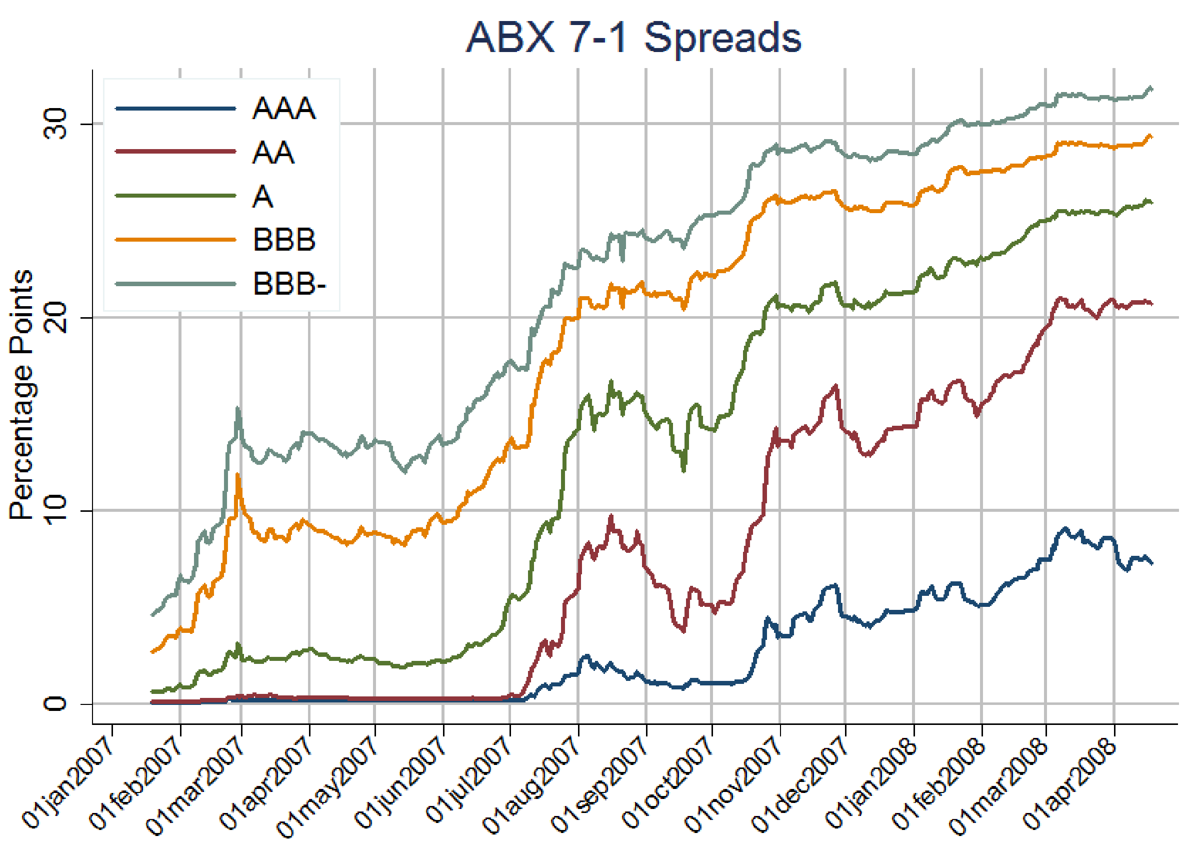
1. Subprime — early 2007 …

   ABCP, banking crisis — July/Aug. 2007 …

   Spillover to corporate credit

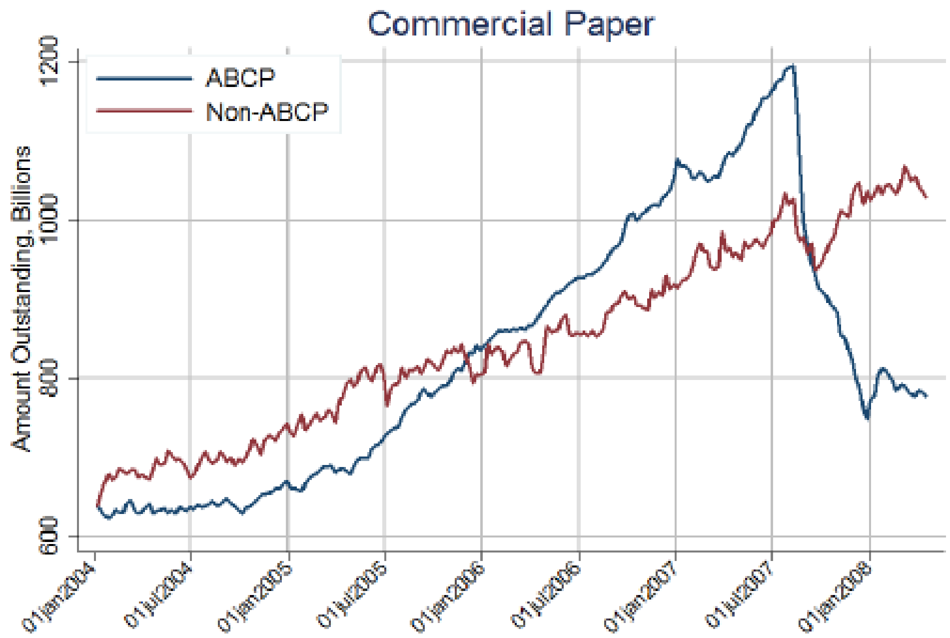
2. Hedge fund (quant) crisis — July/Aug.2007

Unfolding of the Crisis:



Rise in the cost of insuring a basket of mortgages of a certain rating against default increases.

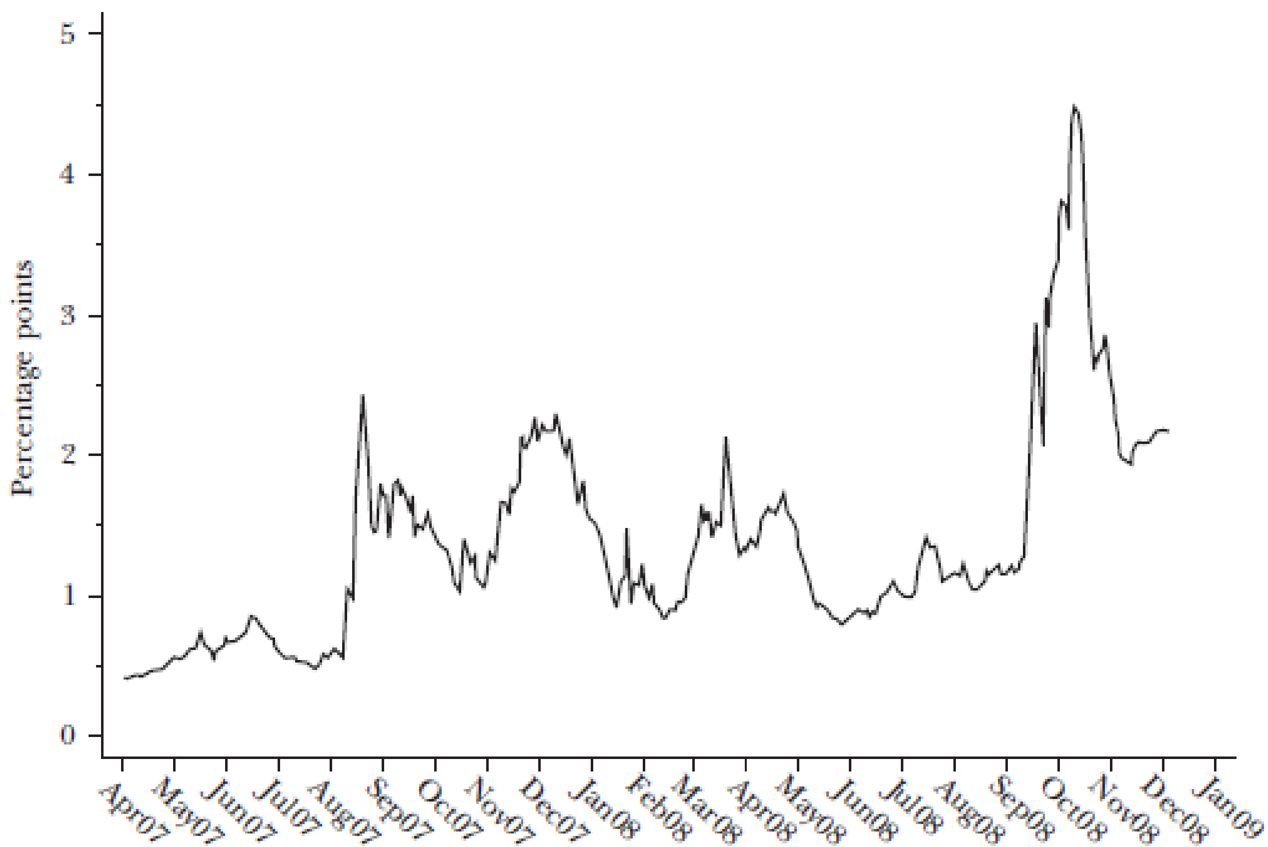
Unfolding of the Crisis:



- ABCP dries up
  - no rollover, esp. by money market funds ("Break the Buck" Rule 2a-7)
- SIVs draw on credit lines of sponsoring bank
- Banking Crisis: IKB, SachsenLB, Northern Rock, IndyMac, …

Unfolding of the Crisis:

The TED Spread



Source: Bloomberg.
Note: The line reflects the TED spread, the interest rate difference between the LIBOR and the Treasury bill rate.

Default risk

Treasury special
- T-Bill – OIS
- Repo spread

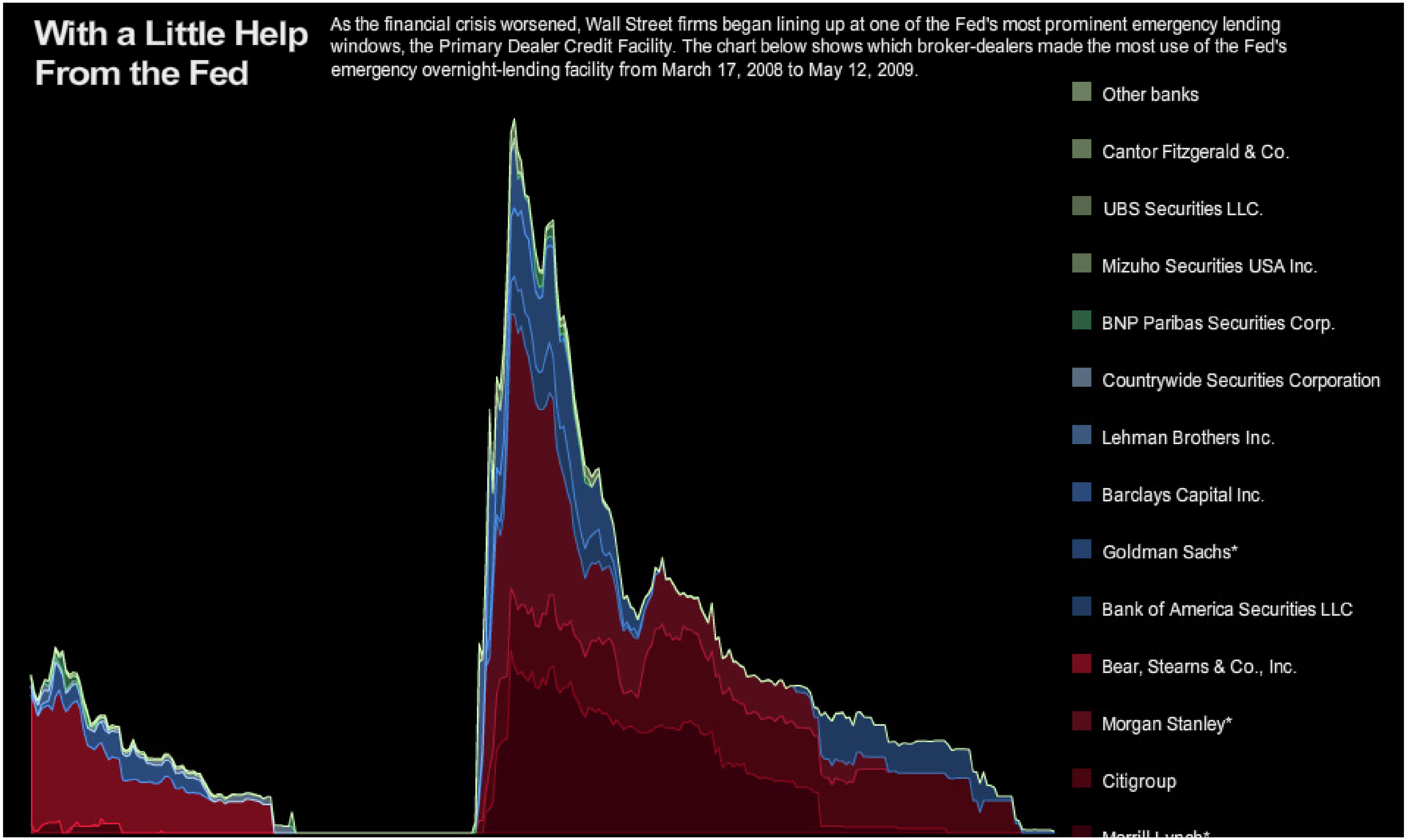
Agency spread leads TED

New lending facilities
- 08/17 TermDW
- 12/12 TAF + Swap
- 03/16 PDCF
- 03/27 TSLF

Interest rate cuts
- 08/17 -.5 (DW)
- 09/18 -.5
- 10/31 -.25,
- 12/11 -.25,
- 01/22 -.75
- 01/30 -.5

Unfolding of the Crisis:

Primary Dealer Credit Facility (PDCF), an overnight funding facility for investment banks.



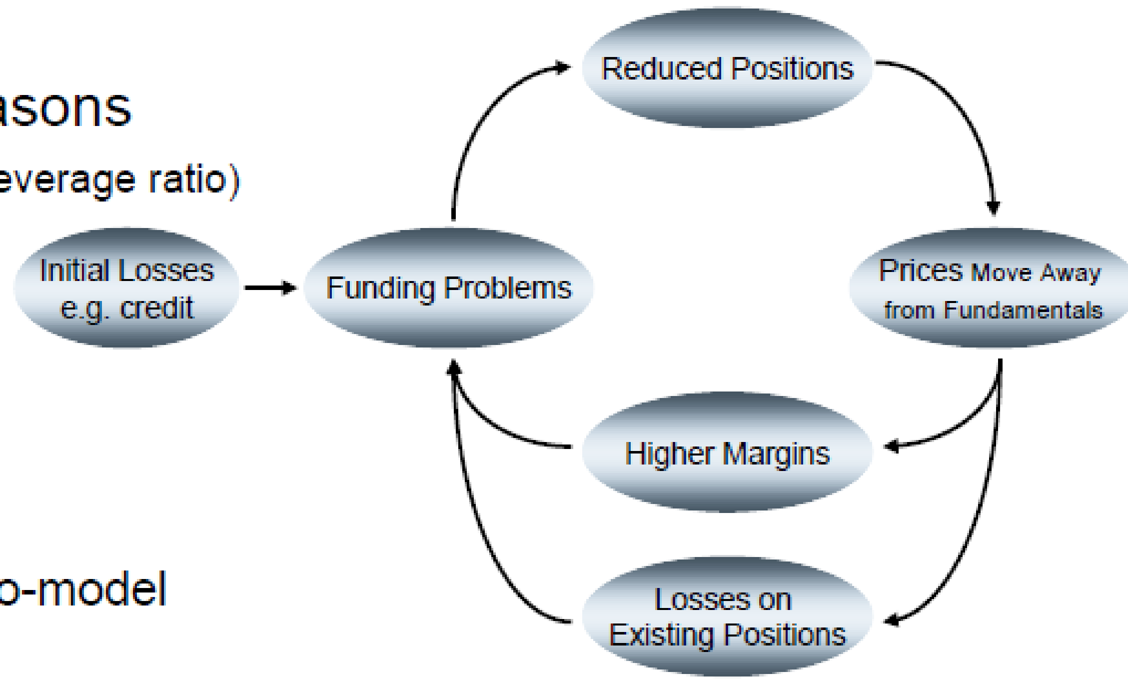
Size of Trigger: Subprime

- Envelope Calculation
  - Subprime mortgage: 15% of US$ 10tr = US$ 1.5tr
  - Say: 50 % default, only recoup 50%
  - Total loss: US$ 375bn, incl. Alt-A say, US$ 500bn
  - 2%-3% change in stock market ≈ US$ 500bn

➢ Amplifying mechanism needed!

Amplifying Mechanism I:

- Borrowers' balance sheet
  - Loss spiral
    - Net wealth > α x
      for asym. info reasons
    - (constant or increasing leverage ratio)
    - Bernanke-Gertler, …
  - Margin spiral
    - (forces to delever)



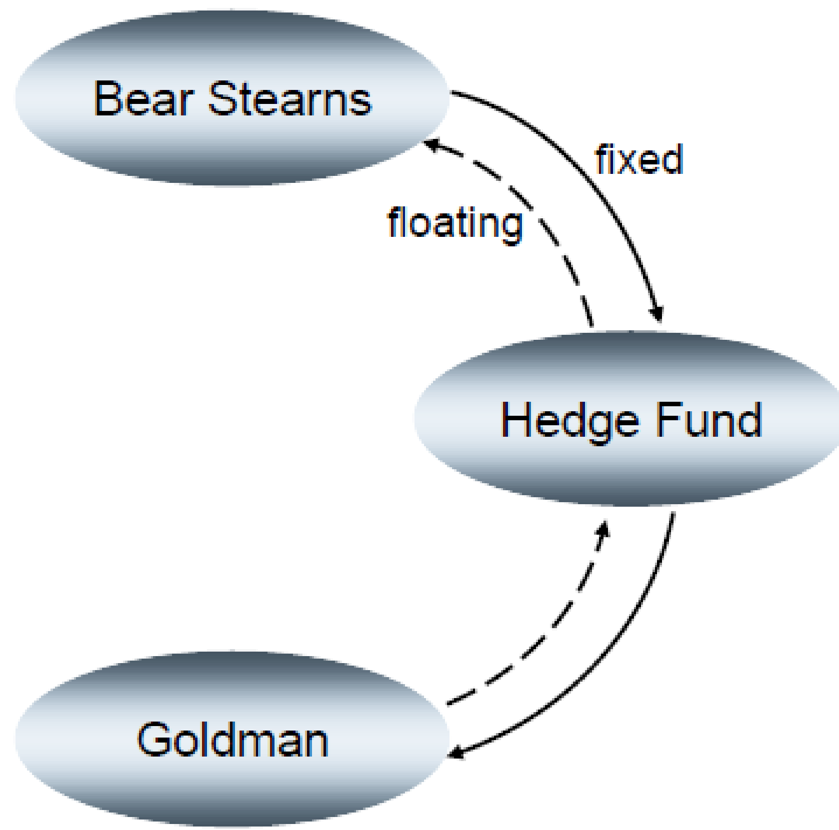
Source: Brunnermeier & Pedersen (2007)

- Mark-to-market vs. mark-to-model
  - worsens loss spiral
  - improves margin spiral

• Both spirals reinforce each other

Amplifying Mechanism II:

- Example: Interest rate swap
  - Hedge fund can "step out" (by netting/novating)
  - March 11th evening, Goldman sent an e-mail to hedge fund: netting that directly exposes Goldman to Bear Stearns can only approved next morning
  - Question: Did misinterpretation led to hedge fund clients run?



- Let's extend the example

Amplifying Mechanism II:

- Extended example:
  - Everything can be netted out
  - But each party only knows his obligations
  - After Goldman's call, hedge fund and private equity fund can't step out
  - More "funding liquidity" is necessary
  - Hedge funds might go under as well