Origins of the crisis are complex...

- Two products
  - Mortgage-derivative financial products (MBS, CMO)
  - Credit default swaps and collateralized debt obligations
- Global liquidity fueled demand for these products
- Products bought with debt - 2004 SEC exemption to big IB debt-to-capital ratios
• Local mortgage vendor makes loan.
• Sells loan to larger bank (poss. Frannie or Freddie)
• Larger bank combines loan w. similar loans - slice that cake into several new pieces sold to insurance companies, mutual funds etc. as bonds (MBS or CMO). “Composite board” bonds.
Mortgage-derivative products lose value as home equity values fall.
Mortgage Troubles Spread

In the last few months, delinquencies and foreclosures in subprime mortgages have started to slow. But defaults on alternative-A and prime loans, which make up a much bigger part of the market, are still rising.
What are “collateralized debt obligations” “credit default swaps”?

If LNT defaults on $1 billion in outstanding bonds and Lehman has sold $10 billion in credit default contracts for LNT’s $1 billion in bonds, Lehman owes AIG $10 billion.

Sept. 23, 2008, Christopher Cox, Chair of U.S. SEC, said worldwide CDS market = $58 trillion, and was "completely lacking in transparency and completely unregulated."
Demand for these financial derivatives fueled by unusual global circumstances

- After the 2001 US stock market bust central banks in wealthier countries loosened monetary policy, interest rates fell to record lows
- Cheap money increases money velocity
- Asian central banks sold dollars to keep their currencies strong
- Globally, cheap money, low investment returns – lots of cash looking for yield
- $M \times V > P \times Q$ (GDP or real output)
- Created asset price bubbles
IBs bought mortgage securities and CDSs with borrowed money!

- 2004 net capital rule exemption (Lehman, Bear, Merrill, Morgan, Goldman) as part of SEC response to Basel II (global financial regulations)
- Net capital rule requires broker dealers value tradeable assets at market prices minus a discount to reflect riskiness to insure they have sufficient capital and liquidity
- Old rule of 12:1 replaced with a system of risk management control, mathematical models to price assets, value-at-risk models, overseen closely by the SEC
Interest rates trends in the US show a cheap money trend, tightening contributing to the home equity price decline.
Credit risk rising as bank credit tightened pre-Lehman announcement

**Ability of Companies to Borrow Money**

*Last 4 Surveys Comparison Dec '07 - Sep '08*

Would you say it is now harder for your company to borrow money than it was 90 days ago, easier to borrow money, or has there been no change in your ability to borrow money?

- **Dec '07:** 1% (Easier)
- **Mar '08:** 1% (Easier)
- **Jun '08:** 1% (Easier)
- **Sep '08:** 25% (Harder)

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Impact of rising credit risk hard to quantify because pricing these bonds is complex

- Value components: credit (default) risk + interest rate exposure + prepayment
- Valuation methods:
  - Market price
  - "Numerical methods provide approximate theoretical prices using the Monte Carlo method or Binomial Tree numerical solutions."
Corporate bond defaults tracked by S&P rose....

- 2007: 16
- 2008 - 1st half: 42
- Sectors with highest default risk as of July:
  - 19 were in media and entertainment, consumer product and retail/restaurant companies
  - Transport
  - Real estate
- 2008: 100?
They accept paper representing a promise to pay from other institutions' – checks, financial assets in the form of letters/contracts.

Banks lend to each other overnight to “settle” inter-bank transactions – e.g. customer does a wire transfer from one bank to another to close on a mortgage.

Which institution’s promises can I trust?
“Bail-out” to help banks purge bad debt and become trustworthy again

- Buy the assets – at what price? no market; mathematical models of value at risk? (US model)
- Buy an ownership stake in the banks (Swedish model)
- Make loans to the banks (Chilean model)
Government guaranteed losses of all financial institutions creditors except shareholders.

To be eligible for government capitalization banks had to write down their losses immediately (instead of deferring reporting losses for as long as is legally possible and using current income for a gradual write-down) and issue stock warrants to the government.

Government “board of valuation” reviewed books to determine bank asset value and a sick hospital took those assets for eventual sale.
• Government loans to banks secured by the bad assets with agreement that banks would eventually repurchase those bad assets
• Shareholders couldn’t take profits out of the banks until the loans were repaid
• Treasury buys bad assets, can hire professional managers to run the “bad asset hospital”
No one can really estimate the impact on US GDP going forward.

- **2008 GDP Growth**: .6%

  *Assumptions*
  - 1\textsuperscript{st} half: Q1 = .9
  - + Q2 = 3.3 ➤ 2.1
  - 2\textsuperscript{nd} half: Q3 = 1.0
    + Q4 = -3.0 ➤ -1.0 %

- **2009 GDP Growth**: 0% at best
Massachusetts economy is slightly better off than national average

- Unemployment at 5.1% compared to national average over 6%
- Health services and education relatively recession-proof
- Local financial institutions, money managers, relatively conservative in their strategies
- High innovation region