The Financial Crisis of 2008: What Went Wrong?

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*The opinions in this presentation are the presenter’s and do not reflect positions of the Federal Reserve Bank of Chicago or the Federal Reserve System.
Prices and Value

- A self-correcting economic system:
  - People respond to price incentives
  - Prices (approximately) reflect fundamental value

- Leading into the current crisis, people responded to prices
  - Yields on risky securities fell, so producers of these securities ramped up production.
  - Prices of residential real estate were high and rising, so homebuilders built more homes.
  - Real long term interest rates fell, so households reduced savings and increased consumption.

- But prices did not reflect fundamental value:
  - Price of risk too low
  - Price of residential real estate too high
Plan of Talk

- Fundamental driver of the crisis
- Mispricing # 1: Risk
- Mispricing # 2: Housing
- The two mispricings come together: Subprime mortgage securitization
- The role of the Fed
- Policy conclusions going forward
The Fundamental Driver

- Massive global capital flows into the U.S. 1998 - 2006
  - Increased productivity of East and South Asian workers
  - High saving rate
  - Savings invested in U.S. financial markets
  - Anomaly: Poor countries sending capital to rich.

- Result: very low real interest rates
Flow of Capital into U.S. and Real Interest Rates

![Graph showing the flow of capital into the U.S. as a percentage of GDP and real long-term mortgage rates over time. The graph includes data from 1988 Q1 to 2008 Q1, with a notable decline in both measures towards the end of the period.]
Price of Risk: VIX + Junk Bond Spread
Low Risk Pricing

- Typical explanation: “The great moderation”
  - Business cycle variability since 1984 dramatically lower
  - Lower fundamental risk in the economy
Lower Risk or Higher Risk Tolerance?

- Alternative explanation: Not only a reduction in risk, but also an increase in risk tolerance.

- Strong incentives for portfolio managers to seek out risk:
  - Low real interest rates lead investors to search for yield.
  - Only way to increase yield: take on additional risk.
  - Portfolio manager compensation contracts provided further incentives for risk-taking
    - Bonuses for short-term performance
    - Hedge fund compensation based on “high water mark”
Tail Risk

- Managers would preferentially take on tail risk:
  - Risk of low probability but high impact events.
  - Example: risk of a broad-based house price decline.

- Tail risk is extremely difficult to quantify.

- Most risk management approaches measure risk by short-run volatility, which can’t capture tail events.

- High yields associated with tail-risk strategies show up as $\alpha$ (high risk-adjusted performance) while it really represents $\beta$ (compensation for risk).

- AIG Financial Products
Mispricing of Housing

- Surplus capital from abroad increases demand for U.S. securities.
  - This demand was met by securitizing residential real estate

- MBS securitizers needed flow of mortgages to satisfy demand
  - Vast expansion of sub-prime mortgage origination

- Major public policy push to extend home-ownership to previously underserved households.

- Volume of sub-prime mortgages soared to meet this demand
  - From 2000-2007,
    - Outstanding amount of conforming mortgages doubled,
    - But subprime grew 800%!
  - By 2006, Subprime /Alt-A mortgage issuance ≈ 30% of the mortgage market
Housing Prices 1987-Present

![Graph showing housing price index from 1987 to present. The index value increases gradually until peaking around 2005 and then experiences a decline. The graph is labeled "Case-Shiller Index."
Housing Starts: 1960 - Present
Housing Bubble

How did housing prices get so far above fundamental value?

– It’s hard to detect a bubble when you’re in the middle of it.
– Housing starts in 2000 – 2005 within historical range.
– Analysis in 2006: increased housing investment could be justified by fundamentals
  • Increased household wealth
  • Financial innovation.
Subprime Mortgage Securitization

- Demand for tail risk + housing bubble combined to create a perfect storm: Subprime MBSs

- Design of MBSs: equity tranche protects the senior tranches.
  - Allows senior tranches to achieve AAA status
  - But: Equity tranche only provides protection if defaults within the mortgage pool have low correlation.
  - Rating agencies estimated these correlations from past data.
  - Impact of tail events on these correlations not taken into consideration
Subprime Mortgage Securitization

- **Problem:** Sub-prime mortgages much more sensitive to house price decline than conventional mortgages
  - When housing prices fall (as in 2006), all the correlations become extremely high!

- **Senior tranches unprotected, fall from AAA to junk.**

- **These formerly AAA-rated assets are now the “toxic assets”**
  - Clogging bank balance sheets
  - Limiting liquidity provision
  - Starving the economy for credit
Did the Fed play a role in the housing bubble?

A story put forth by some observers:
- The housing bubble was caused by excessively easy monetary policy from 2001 – 2004.

To evaluate this story, we need to ask:
- Was the Fed’s monetary policy excessively easy given the circumstances prevailing in 2001 – 2004?
- How much could the housing bubble have been offset by a more restrictive monetary policy from 2001 – 2004?
Federal Funds Rate 2000 - 2007

Excessive Liquidity?
Monetary policy in 2001 - 2004

The Fed's legal mandate is to foster:
- Maximum sustainable employment
- Price stability

Employment in 2001 – 2003
- The 2001 recession ended in November, but the economy continued shedding jobs until Q2:2003!
- Fed continued cutting rates well into 2003.

- Inflation rate measured in real time fell to 0.7% in June 2003.
- Flirting with deflation, much more debilitating than inflation.
- Fed response: continue to cut interest rates to 1%.
Could the Fed have offset the housing bubble?

- Fed controls the very short interest rate

- Housing responds mainly to long term interest rates

- During this period, the link between long and short rates was unusually weak.
  - Likely reason: huge capital inflow from abroad pushing long rates down.
Relationship between long rates and short rates

- 10-Year T-Note Yield
- Fed Funds (Effective)
Fed’s Response to the Crisis: Provide Liquidity

- Vast expansion of Fed balance sheet
  - August 2007: $900 billion
  - April 2009: $2 trillion

- Innovative programs to inject liquidity into specific markets
  - Term Auction Facility (TAF)
  - Liquidity Swaps with Foreign Central Banks
  - Commercial Paper Funding Facility (CPFF)
  - Agency MBS purchase program
  - Term Asset-Backed Securities Loan Facility (TALF)
Long Run Policy Implications

■ Measurement and containment of tail risk
  – Managerial incentives
  – Disruptive effects of housing mispricing

■ Thorough revision of failure resolution procedures
  – Bank failure resolution through FDIC works fairly well
  – No comparable procedures for bank holding companies or non-banks

■ Should the Fed pop asset price bubbles?
  – Can the Fed identify bubbles in a timely fashion?
  – Can Fed action have a substantial impact on a bubble?
  – Will the benefits from popping a bubble exceed the cost?