Financial Turmoil: The Grand Tour

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"I THOUGHT WE WERE JUST BUYING A HOUSE!"

Disclaimer:

- The views and opinions expressed in the following presentations are those of the author.
- They do not represent an official position of the Federal Reserve Bank of Richmond or the Federal Reserve System.

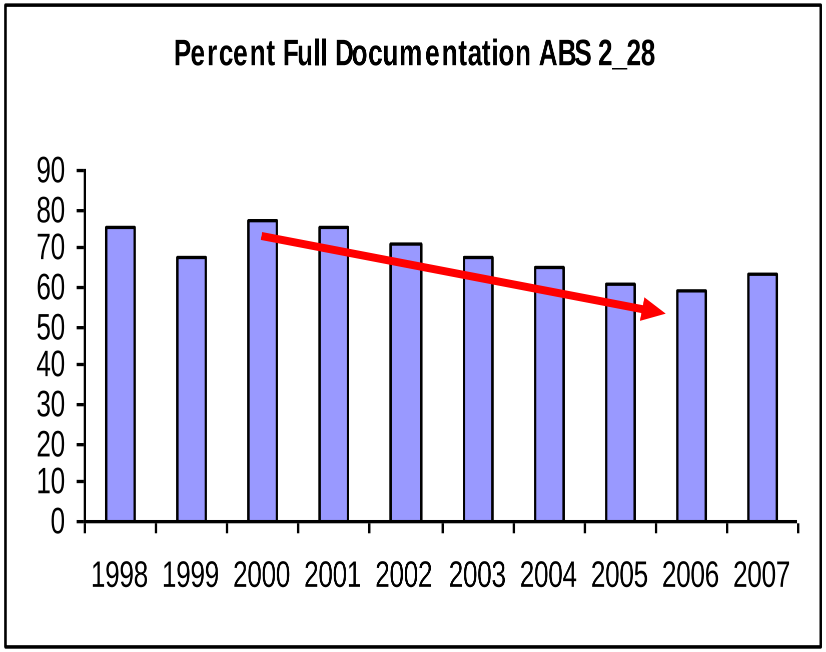
Lots of ground to cover today

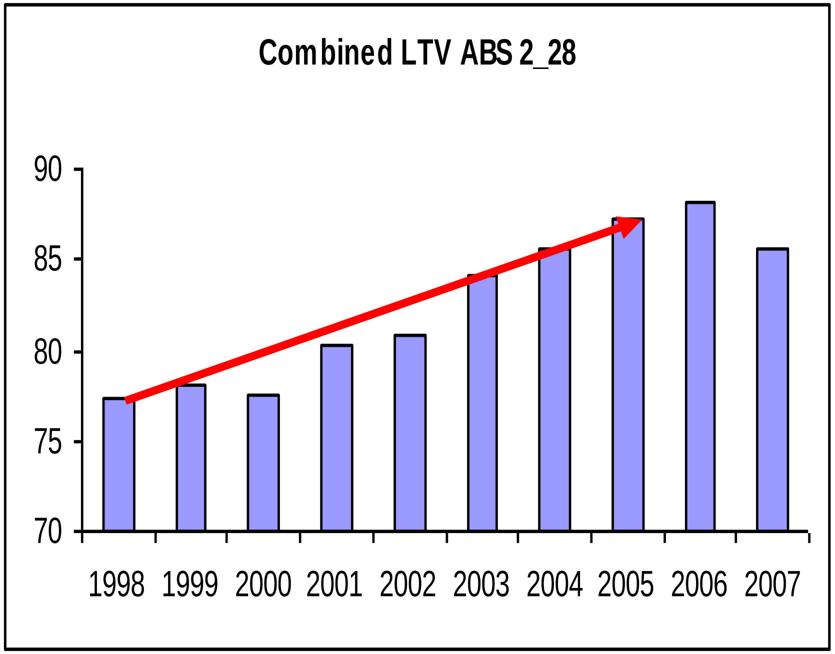
- The main suspects in the subprime crisis
- How home mortgages are used to construct different kinds of financial assets.
- How defaults on mortgages affect the value of those assets and caused the problems in *mortgage* markets to spread to *financial* markets
- How the crisis spread through the financial system
- Where we're headed next, including conditions in ABS markets
- An overview of the policy responses, TARP, TALF, PPIP

Suspects in the subprime crisis

- Technological innovation in the delivery of credit
  - Modeling approaches allowed lenders to more finely differentiate and pool riskier borrowers…borrowers who had trouble getting credit in the past
- **Did lenders overshoot?**

Underwriting standards slipped steadily





Source: Federal Reserve Board calculations using Loan Performance data

Increasingly riskier loans. In 2006, 40% of loans had CLTV > 95%

Suspects in the subprime crisis

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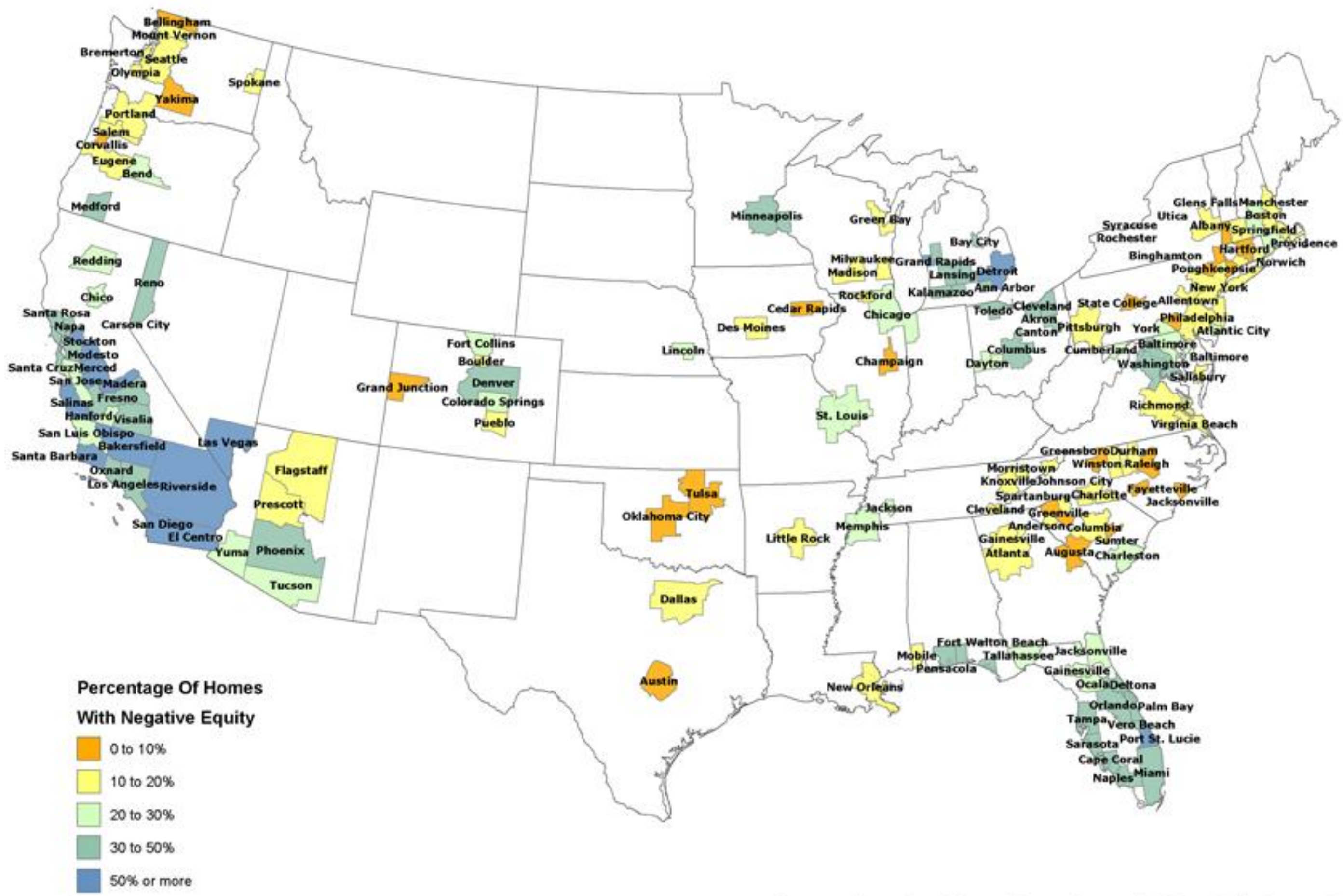
- Did lenders overshoot?
- **High CLTV means thin equity for homeowners.**
  - **Doesn’t take much of a decline in prices to put homeowners “under water”**
  - **Lenders might have underestimated the probability of a broad housing shock**

Percentage of homes purchased between 2003 and Q3-2008 with Negative Equity Currently
Zillow.com® US Home Value Report - Q3 2008



See more data at: http://www.zillow.com/reports/RealEstateMarketReports.htm

Suspects in the subprime crisis

- Technological innovation in the delivery of credit
- Did lenders overshoot?
- High CLTV means thin equity for homeowners.
- **Some observers pointed to a regulatory and supervisory framework "insufficiently prepared" for a big shock**
  - **Private sector incentives to protect dampened by implicit support for Freddie and Fannie?**
    - **Other incentive problems with off balance sheet lending?**
  - Official policies to increase homeownership induced some risk taking in housing finance?
  - Unscrupulous and fraudulent practices of some mortgage brokers outside the banking sector?

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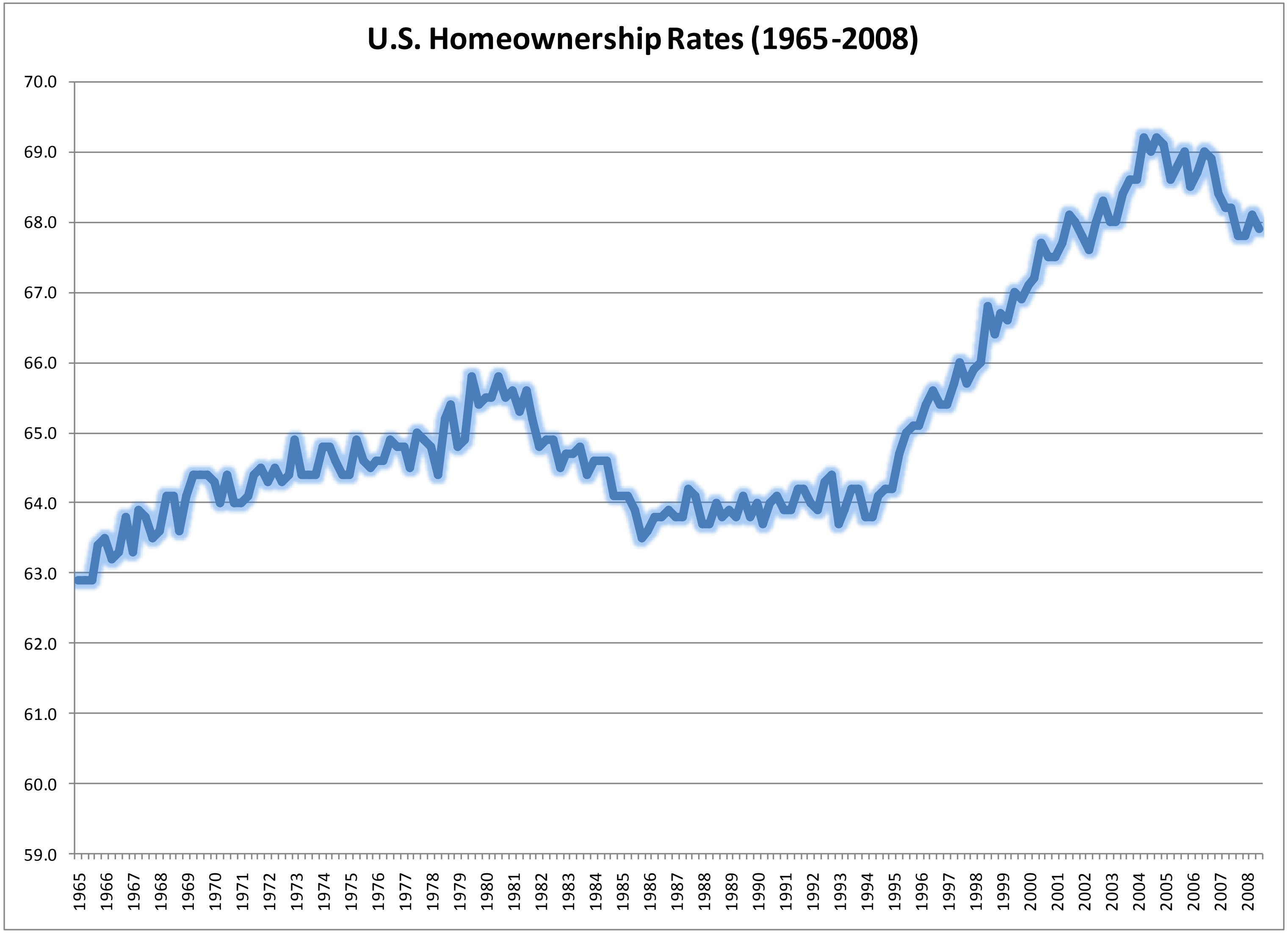

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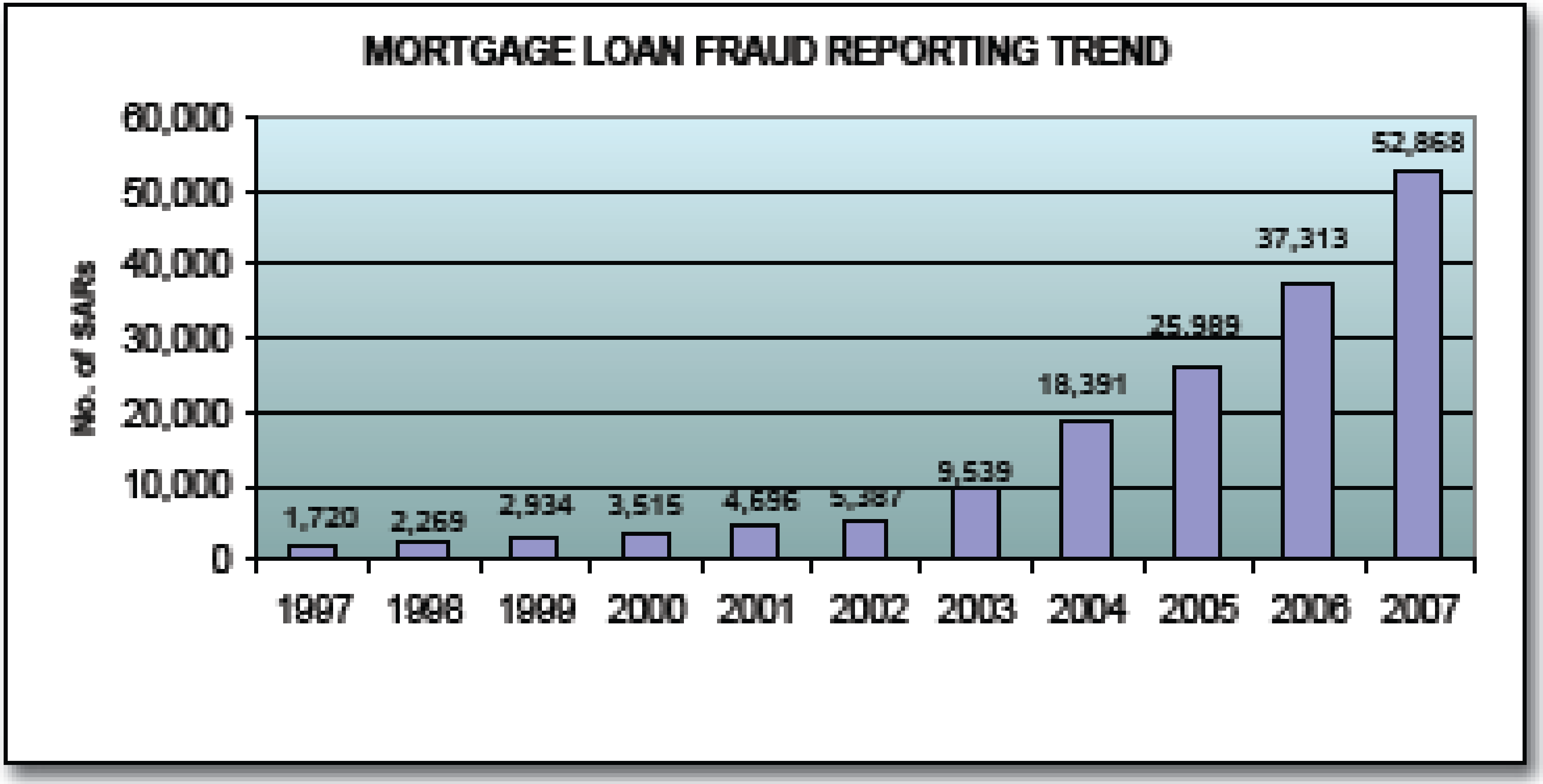

Source: Dept. of Treasury: Financial Crimes Enforcement Network

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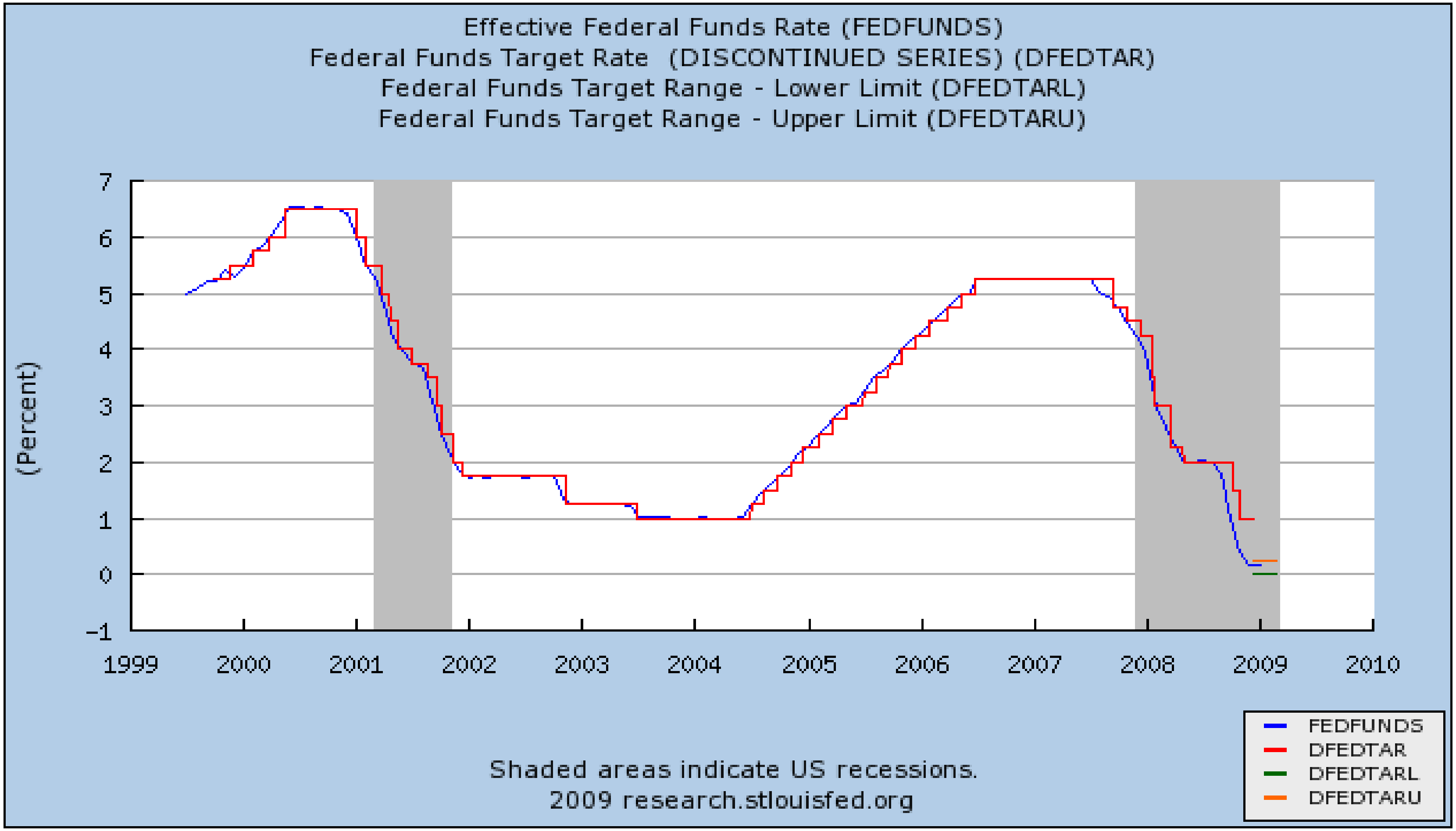
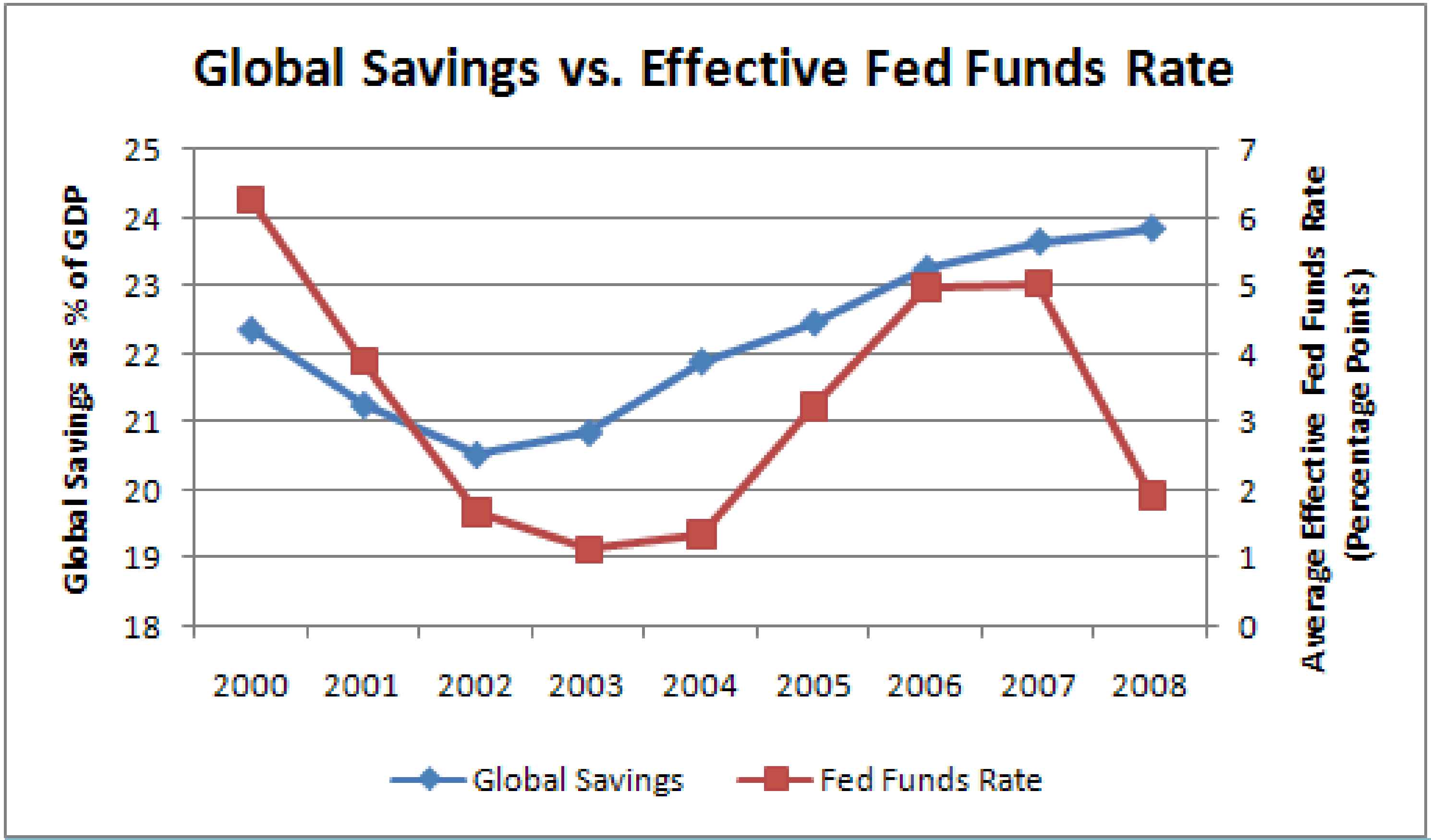
- **Some observers have also pointed to monetary policy that kept interest rates low after the 2001 recession**



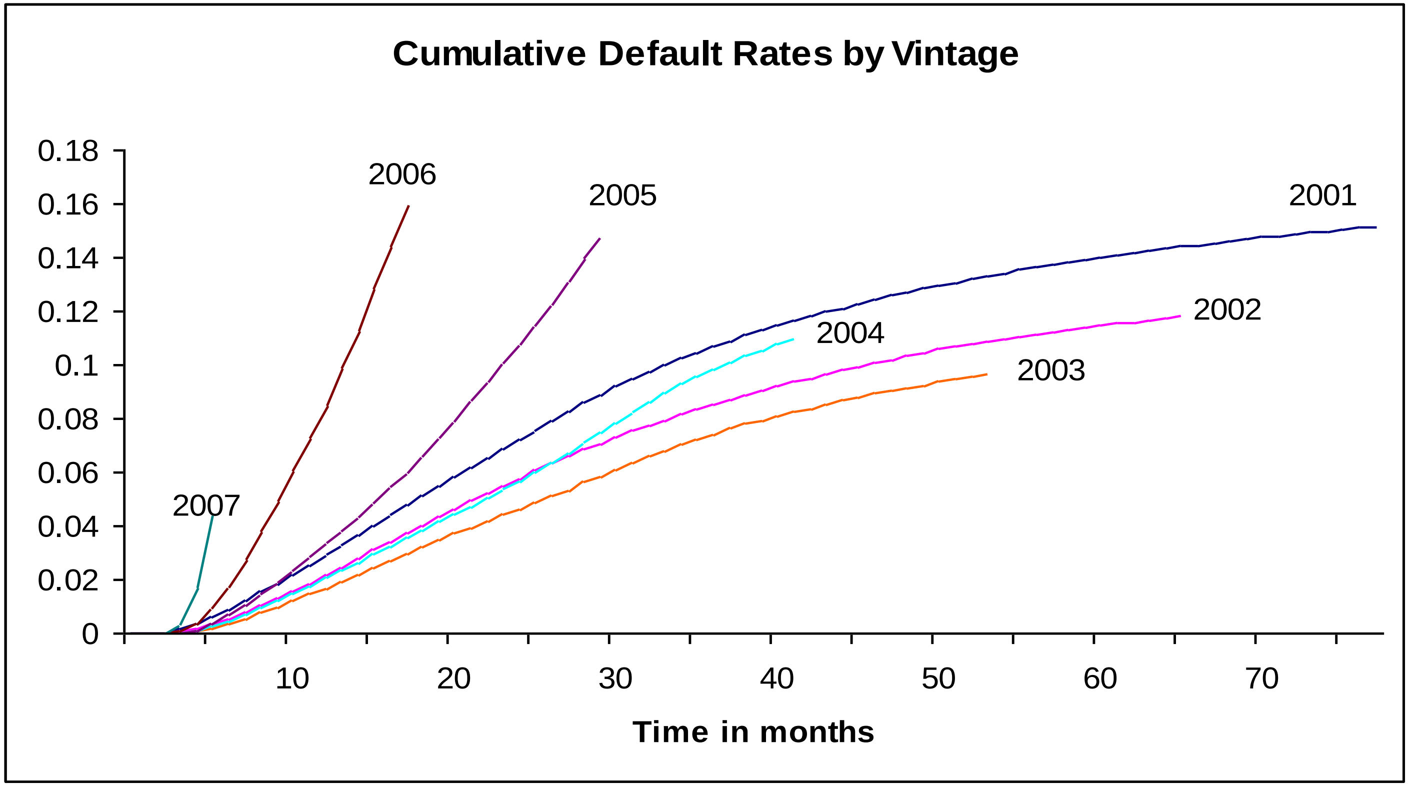
- The easy money story: low interest rates made mortgages more affordable, increased demand for houses, raising prices. Low rates also led investors to chase yields & increase supply of capital to MBS

But there was also a “global savings glut”



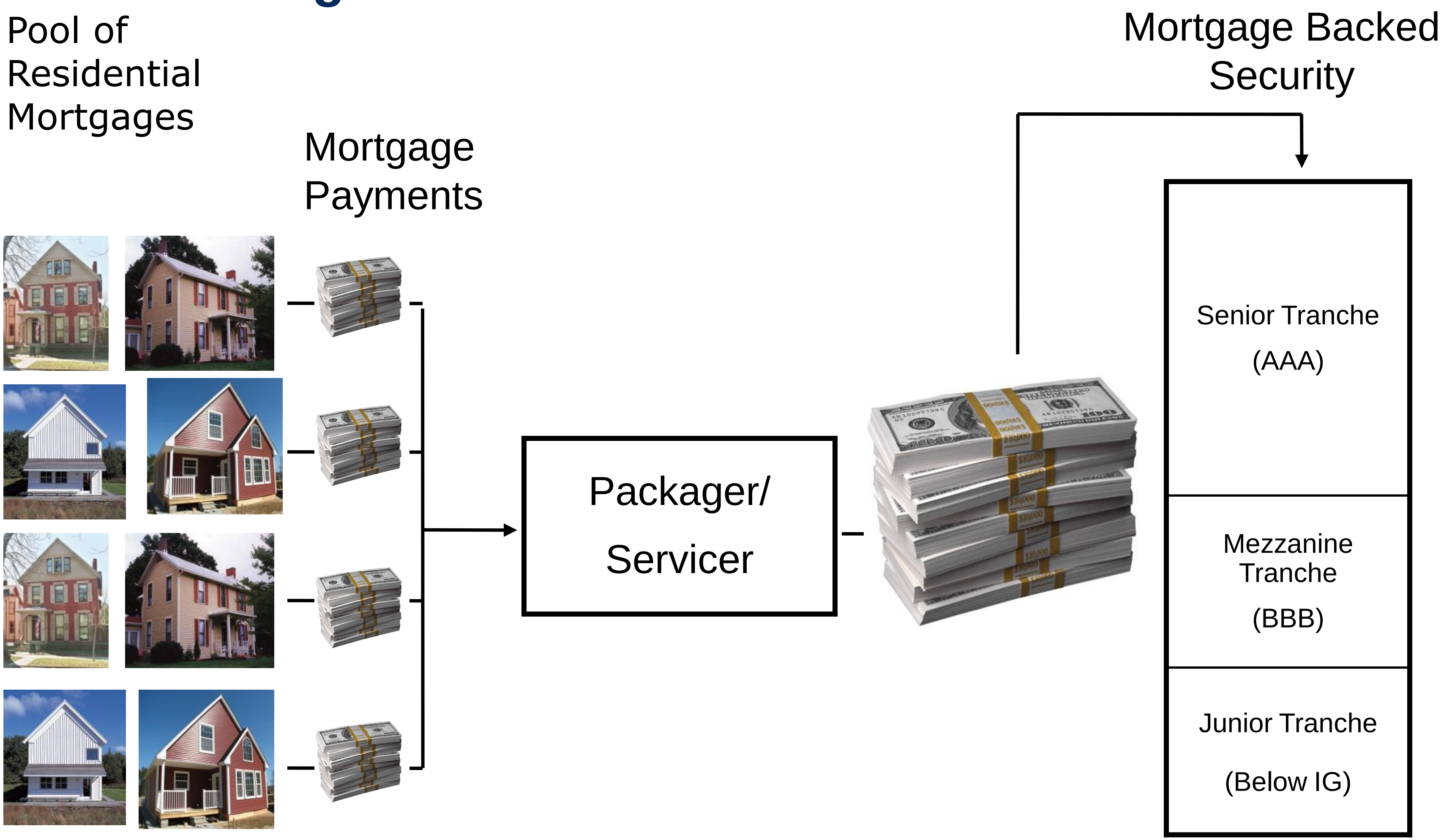
Global savings increasing the same time the fed funds rate was falling. Which, or both, were drivers will take much research.

Away we go…



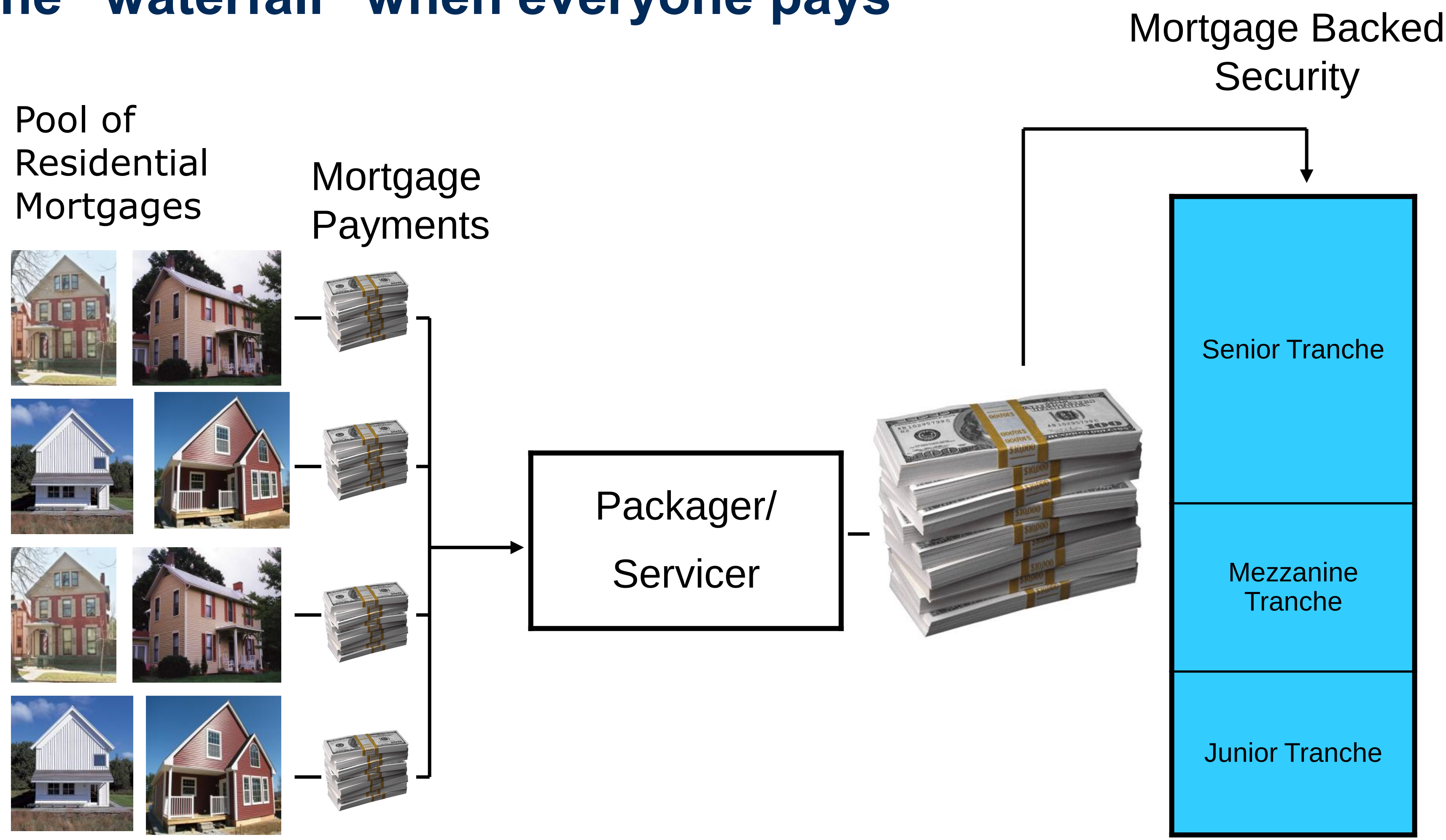
Source: Federal Reserve Board calculations using Loan Performance data

From housing to finance: securitization in a nutshell



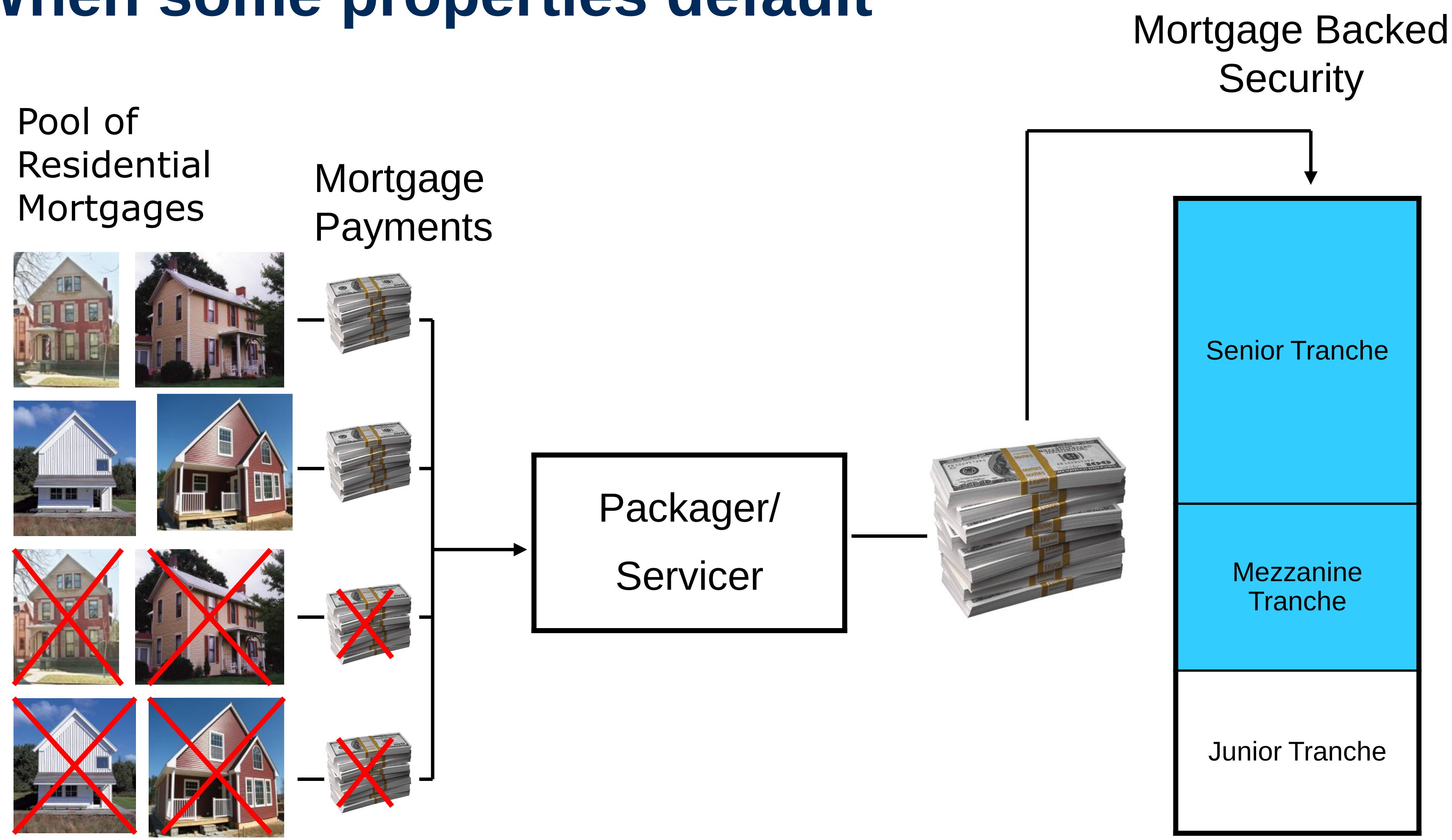
Mortgages are pooled & create a set of mortgage backed securities (MBS). MBS are bonds. Mortgage payments become interest payments to bondholders

The “waterfall” when everyone pays



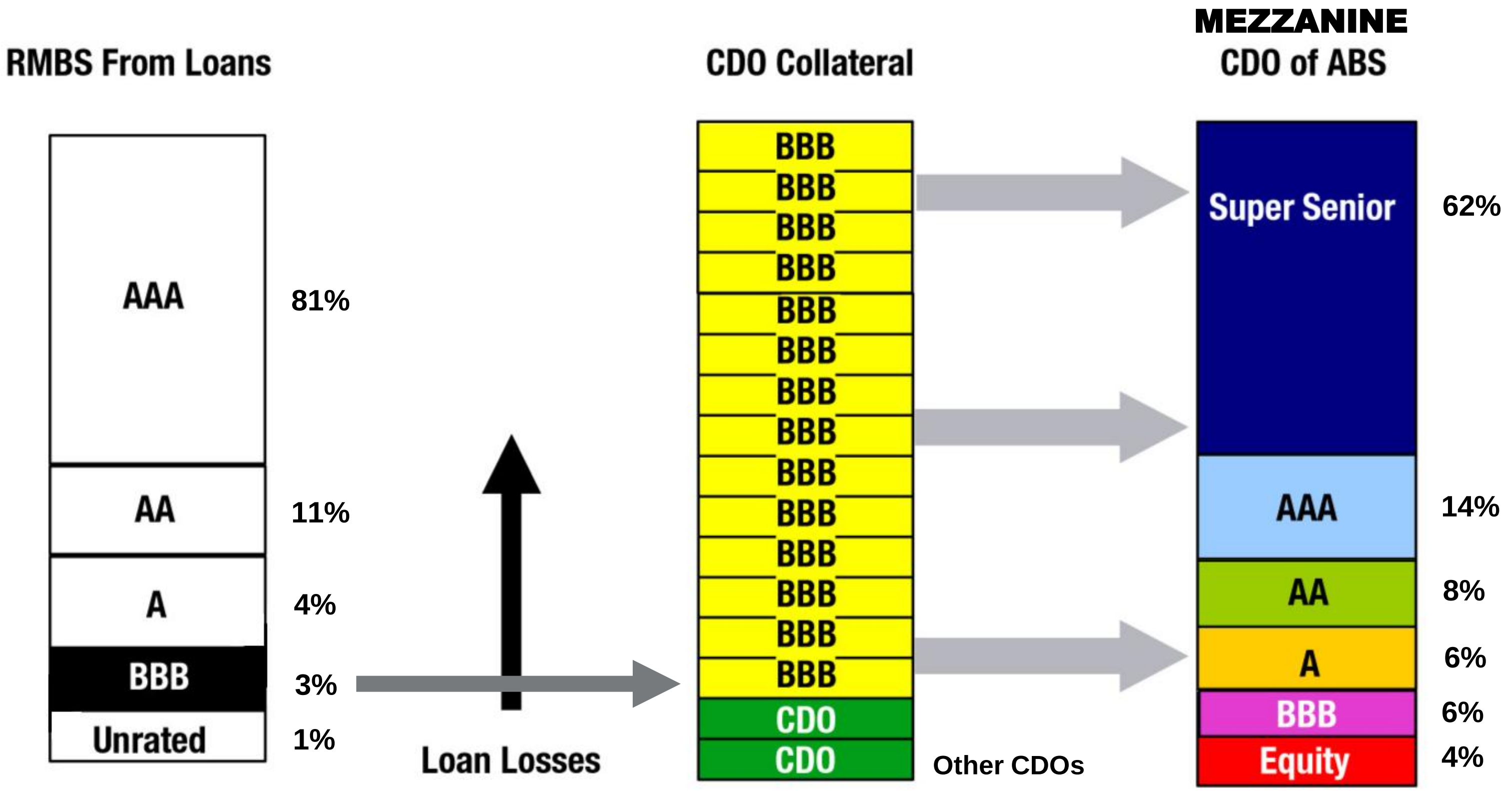
Senior bonds (with the highest credit rating) must be fully paid before subordinate bonds get anything. Called a “cash waterfall.”

When some properties default



When properties default, less cash goes into the top of the waterfall. Losses felt first at the bottom of the waterfall & work upwards.

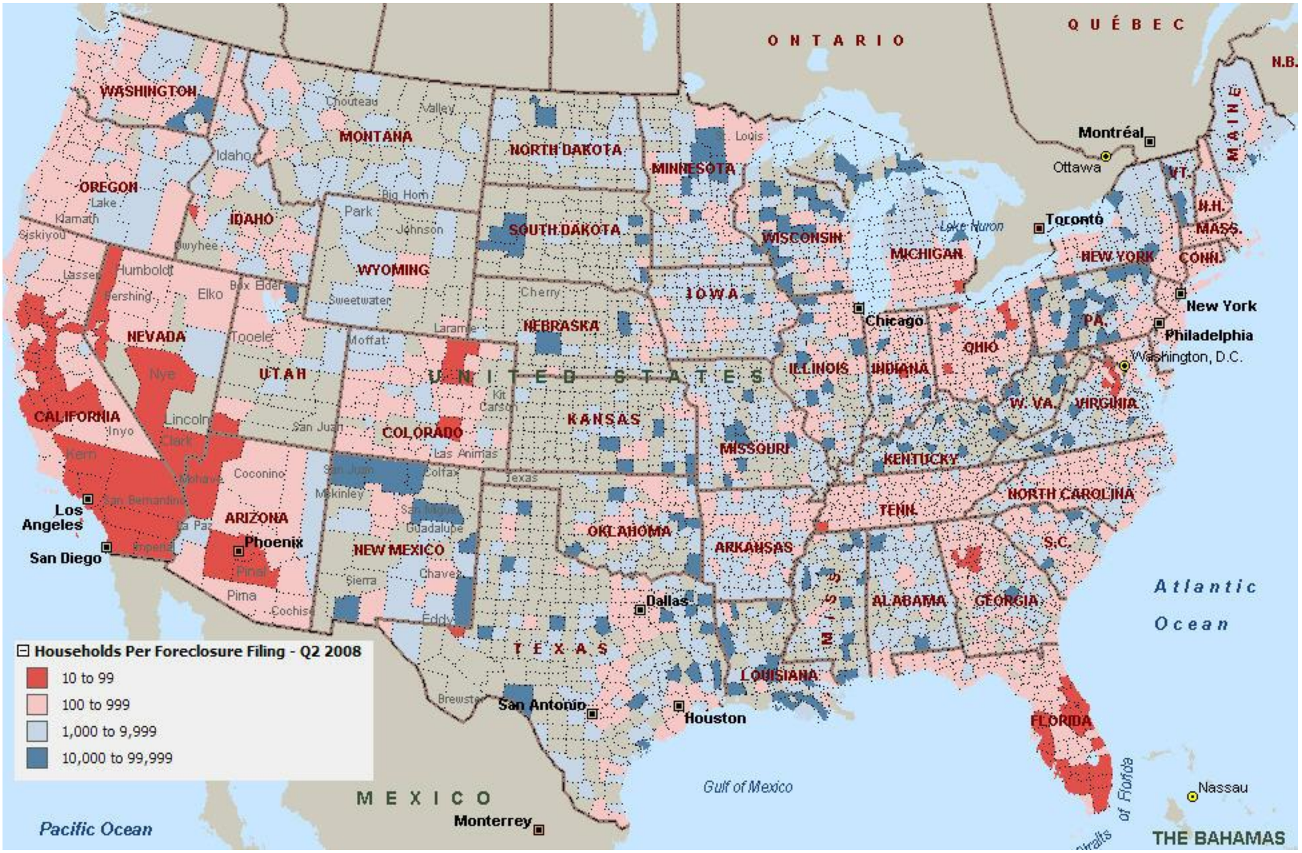
CDOs (Collateralized Debt Obligations) in a nutshell



Sources: Intex and Citi.

CDOs were heavy investors in mortgage backed securities.
Lots of embedded leverage.

Foreclosures spread across much of the country



"Diversifying sufficiently among uncorrelated risks can reduce portfolio risk toward zero, but financial engineers should know that's not true of a portfolio of correlated risks." Harry Markowitz

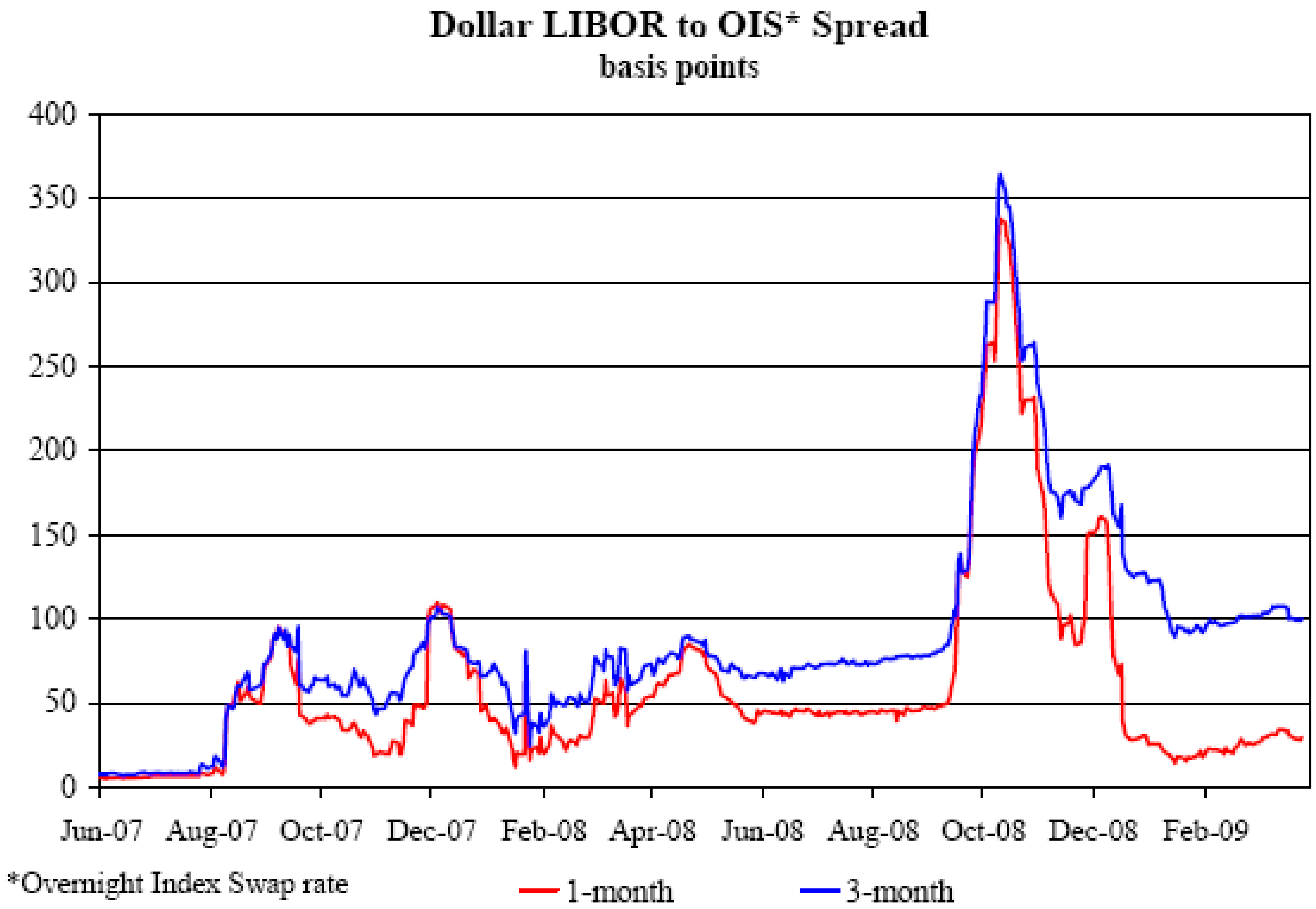
Source: Realtytrac

Investors in collateralized debt obligations (CDO) & mortgage-backed securities (MBS) were pressured

- As the value of their underlying mortgage collateral deteriorated, owners of CDOs and MBS suffered losses.
- Who were (some of) the buyers?
  - Banks, both domestic and foreign (in excess of a half trillion dollars in reported losses)

The crisis is global

- Uncertainty in US financial markets led some institutions to retreat from providing funds to term money markets
  - And on the macroeconomic side, essentially all of the big economies are now growing slowly or shrinking, plus…
    - “Polish GDP Slowed Sharply in Fourth Quarter”
    - “Indian Economy Slowed Sharply in Fourth Quarter”
    - “Swedish Economy in Worst Slump in Decades”
    - “South African GDP Slips Into Negative Territory”
    - “Mexico Slides into Recession”
    - “Taiwanese GDP Tanked in Fourth Quarter”
- Spreads Indicating a lack of liquidity remain elevated, although they are down from very high levels
- Very popular to show the LIBOR-OIS spread as a measure of tightness in credit markets



Source: Federal Reserve, Bloomberg

Elevated spreads mean that international money markets are under pressure. You care because much of the US adjustable rate debt is tied to LIBOR.

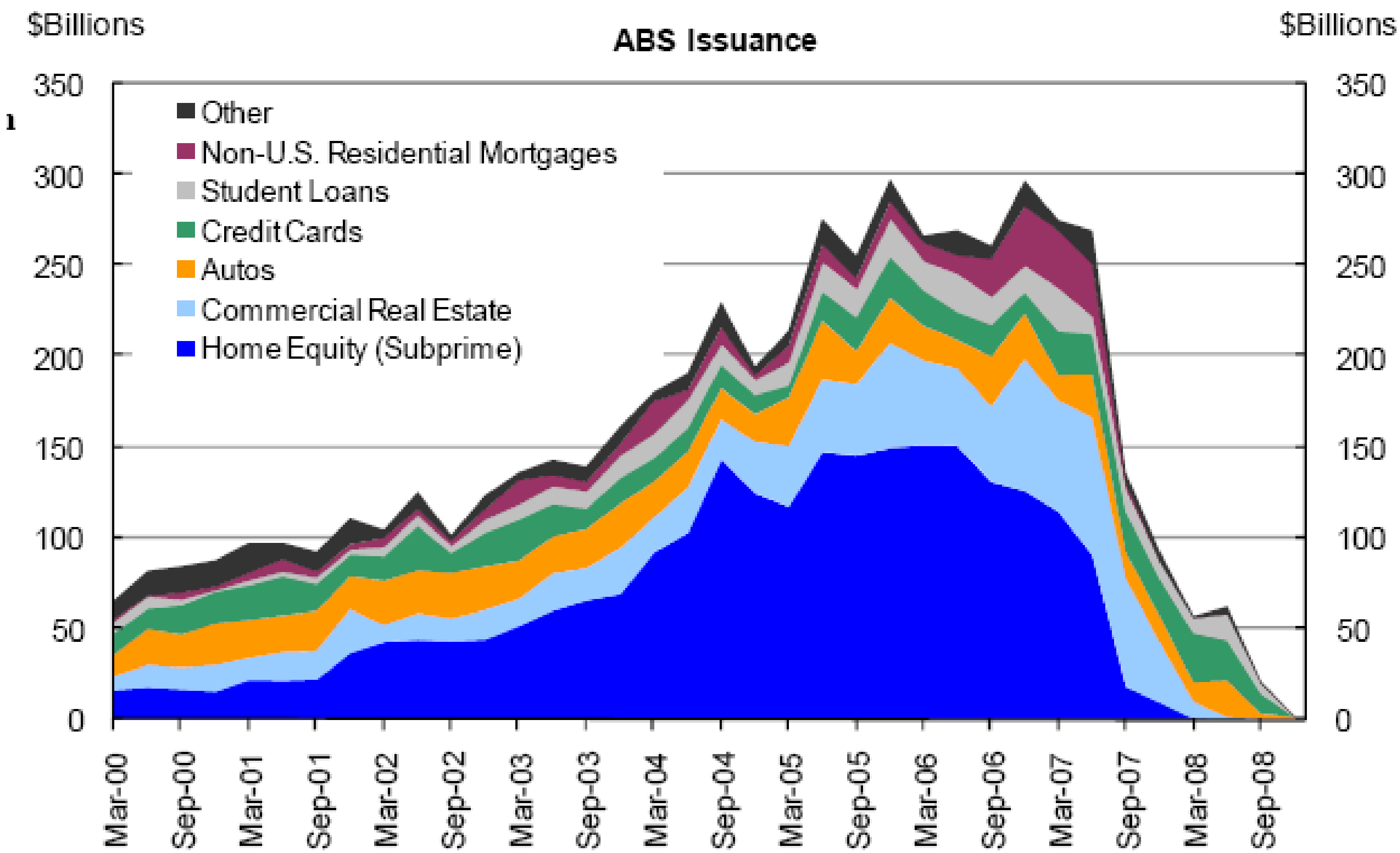
Where are we now?

- Valuation of mortgage related assets is uncertain
  - Home prices are still falling.
- When assets values are hard to determine, they become illiquid (hard to trade & exchange for cash)
- Liquidity can put extreme pressure on financial institutions. “How do I meet my obligations if my assets are illiquid?”
  - Many of the institutions that failed or were supported suffered liquidity crises

Where are we headed next?

- Activity in ABS markets has declined dramatically
  - Cars
  - Autos
  - Student loans
  - Residential mortgages
  - Commercial real estate
  - Subprime mortgages
- What does this mean? Some debate
  - Are they “stuck”
  - Or is the slowing macroeconomy reducing the demand for credit?

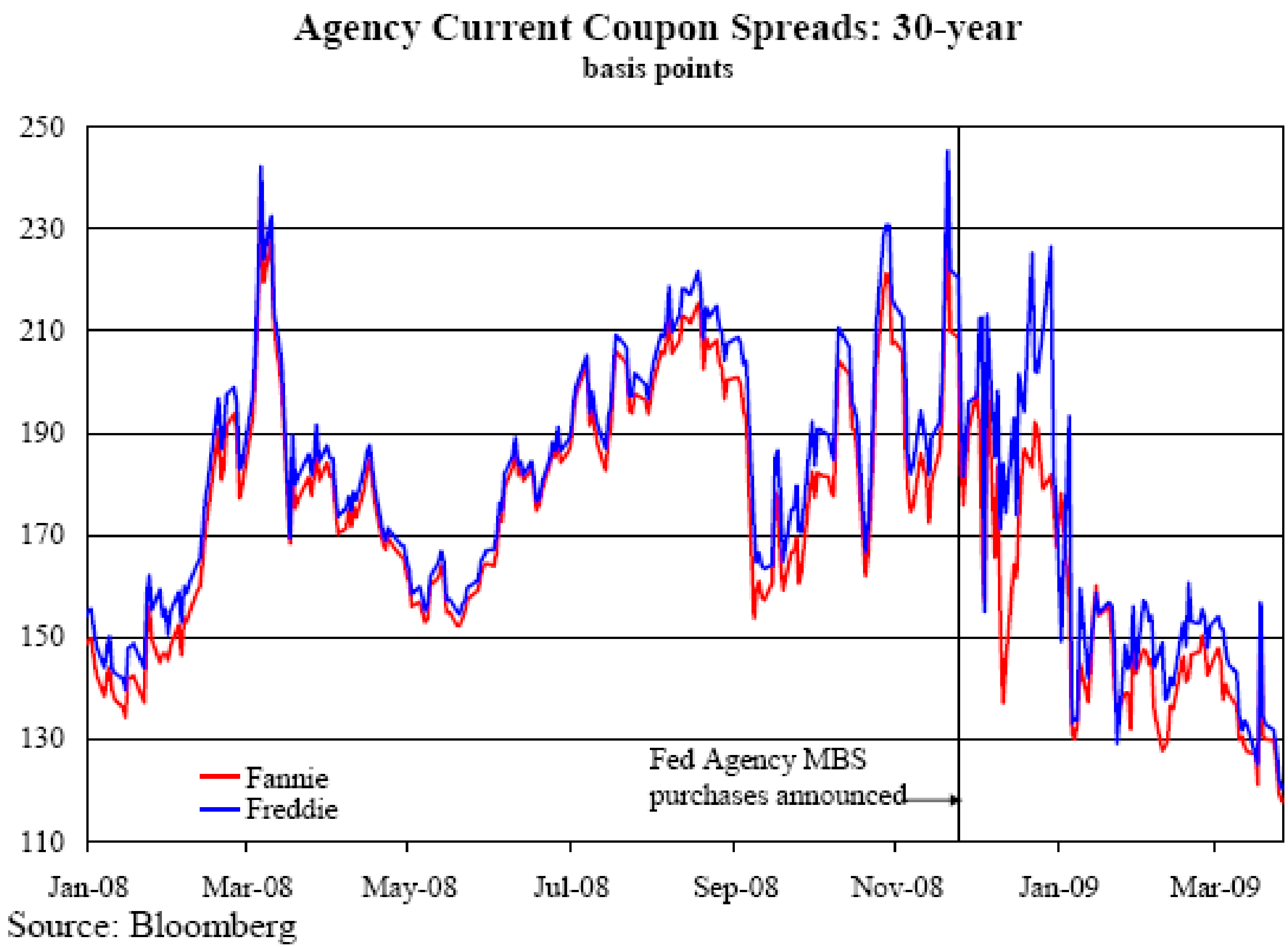
ABS issues appear to have “fallen off a cliff”

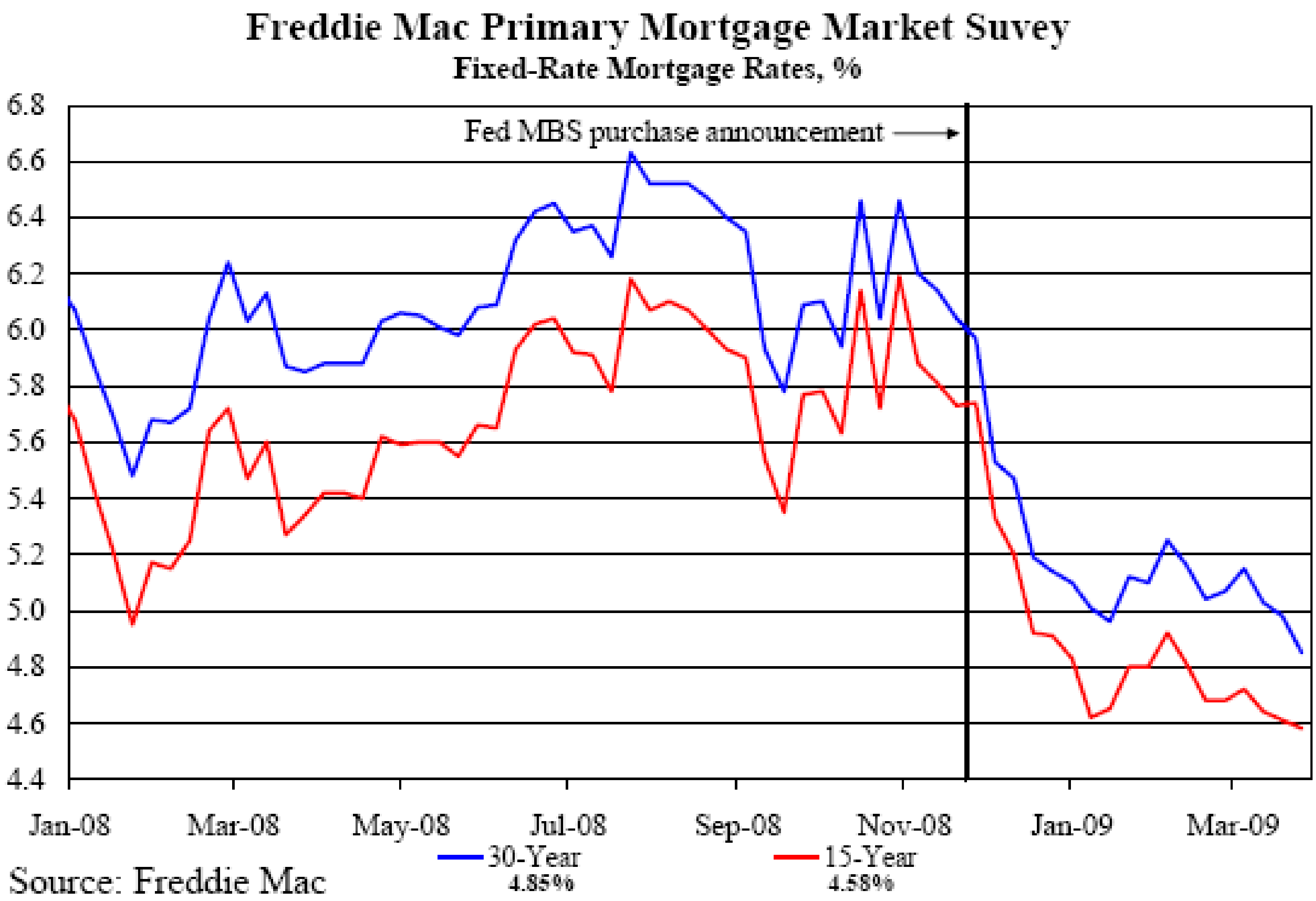


Source: JPMorgan

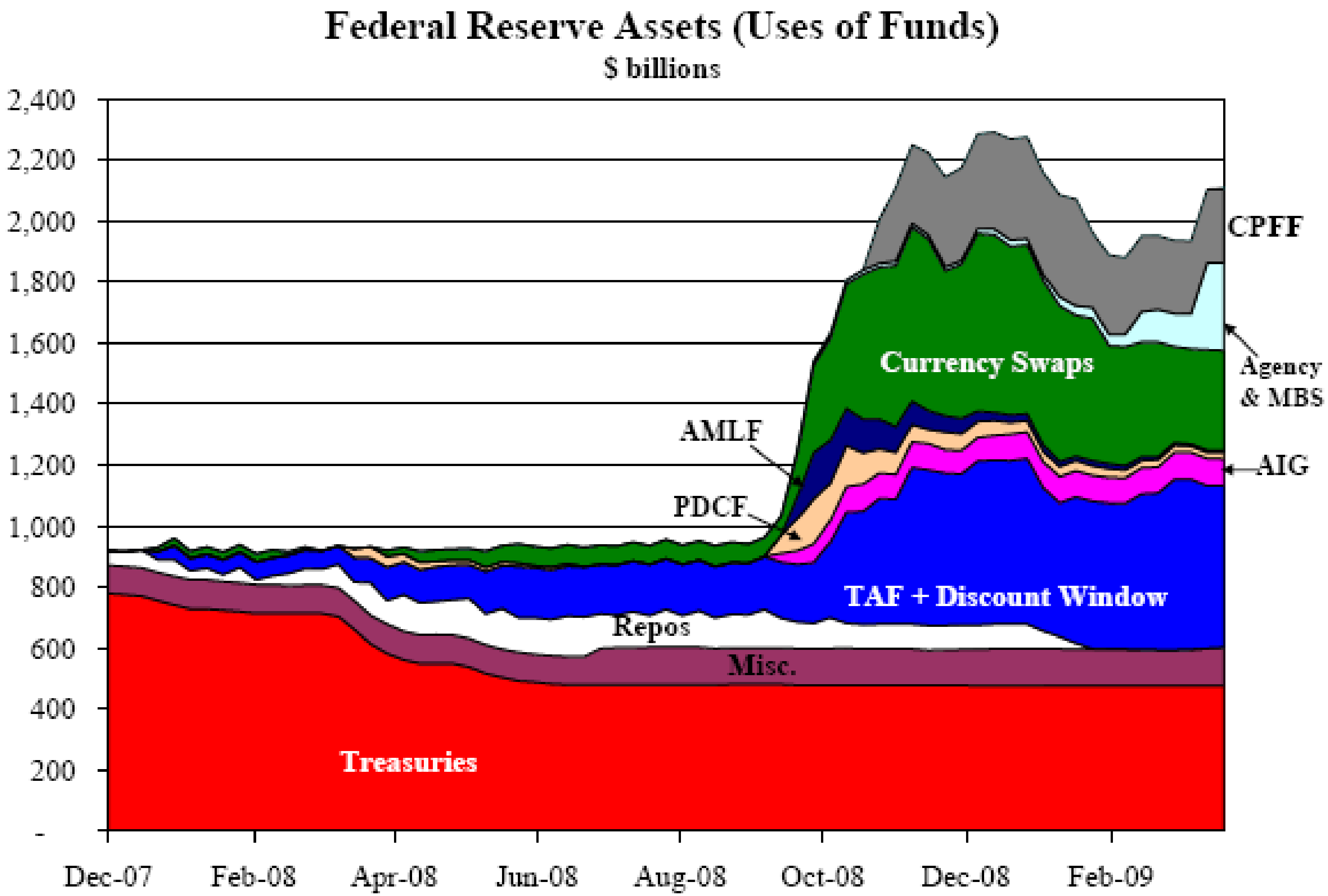
Policy response: The Fed and mortgage markets

- The Fed is buying mortgage debt in a bid to stabilize conditions in MBS markets
- So far,
  - Purchased over $35b of direct agency obligations. Pledged $100b by 2009:Q2
  - Purchased $159b of agency-backed MBS. Pledged purchases are $500b
- Has this had an effect?
  - Yes

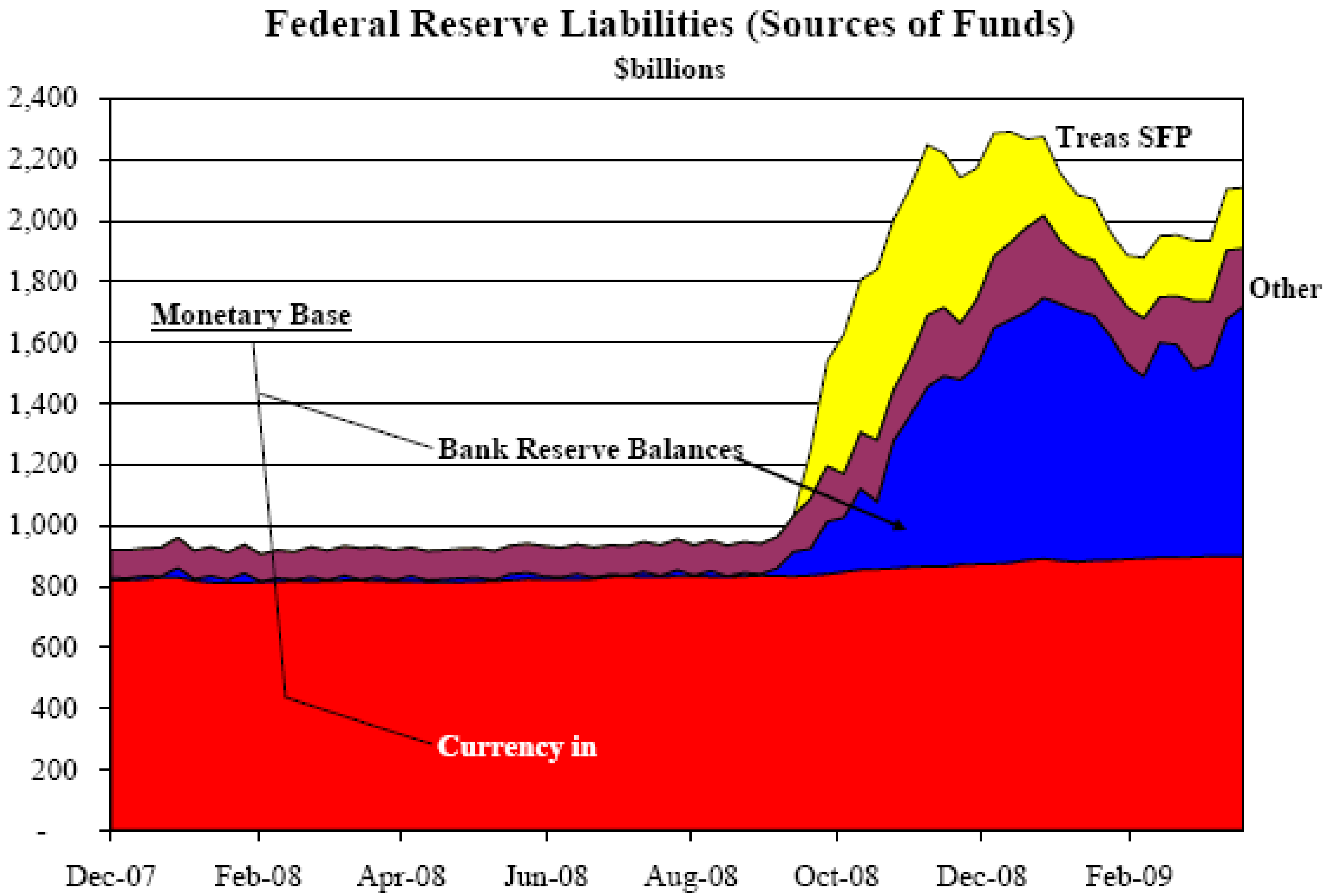

Agency Current Coupon Spreads: 30-year
basis points
250
230
210
190
170
150
130
110
Fannie
Freddie
Fed Agency MBS
purchases announced
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09
Source: Bloomberg


Freddie Mac Primary Mortgage Market Suvey
Fixed-Rate Mortgage Rates, %
Fed MBS purchase announcement
6.8
6.6
6.4
6.2
6.0
5.8
5.6
5.4
5.2
5.0
4.8
4.6
4.4
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09
30-Year
4.85%
15-Year
4.58%
Source: Freddie Mac

A snapshot of Federal Reserve responses



How have these responses been financed?



SFP = Supplementary Financing Program

The TARP

- Two-pronged policy, improve liquidity/add capital & promote lending
  - Treasury to take direct equity stake in banks (adds capital)
    - And they have
  - Treasury authorized to buy $700b in troubled assets
    - And they did some of this
    - The hope is that buying these assets will create a more liquid market for them.
    - Why hasn't this been easier to implement?

Because it's really hard

- The pricing mechanism is very challenging
- Here's a little bit of theory (sorry)
- Banks hold two types of assets—"BAD" and "GOOD"
  - Suppose only the bank knows which is which
- If you offer to buy an asset, the bank may give you the BAD one. So you won't pay P_G, you'll pay only P_B
  - That means banks won't sell GOOD assets, because they can't get P_G for them. The market for GOOD assets dries up.
- The market for BAD assets might dry up, too, because since we all know GOOD assets won't be sold, if try to sell any assets, you're telling everyone you have BAD assets.
  - So everyone wonders: does that mean you're a bad bank?

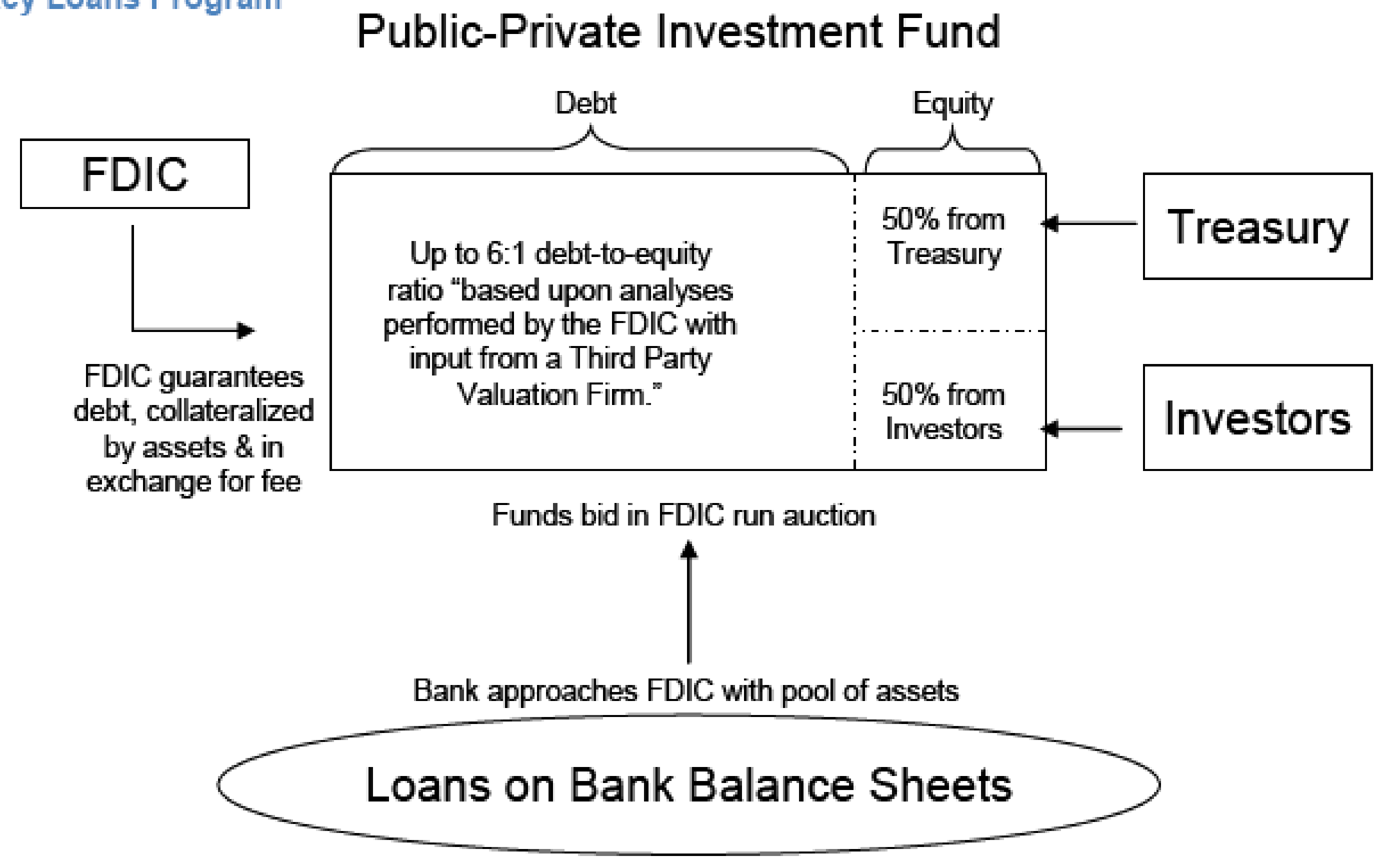
Into this steps the government

- It can't pay more than P_G—that would be more than the "fair market price"
- If it pays between P_G and P_B, banks won't sell their GOOD assets, only their BAD ones. Again, the government won't be paying the "fair market price"
- If the government offers P_B, well, that's the market price anyways
  - And if the Bank sells assets to the government at P_B, it has to worry what that signals to the market
- What the government needs to do is to find the "right" price, which is the "fair market price" in a liquid market (which may be more than P_B)
  - And that is the challenge

TALF and PPIP: Newest policies

- Term Asset Backed Securities Loan Facility (TALF) also designed to combat problems in ABS markets
  - FRBNY provides non recourse loans to purchase ABS (beyond mortgages)
  - Eligible ABS must be "cash" not "synthetics"
    - Collateral includes autos, student loans, credit card loans, floor plan loans, small business loans (guaranteed by SBA) issued after 1/1/2009
- Public Private Investment Program (PPIP)
  - Treasury partners with private entities to provide equity that may be leveraged to purchase "legacy loans" and "legacy securities"
  - The loans program is easier to explain quickly

Chart 1: Legacy Loans Program



Source: J.P. Morgan

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