The Financial Crisis and the FCIC

Wendy Edelberg
June 15, 2011

Views expressed in this presentation are my own and not those of the Financial Crisis Inquiry Commission or the Congressional Budget Office.
Outline

• Structure of Commission
• The Housing Crisis (Part III)
• The Financial Crisis (Part IV)
The FCIC

• Created by the Fraud Enforcement and Recovery Act, May 2009
  – 22 topics to examine; 10 commissioners; nearly $10 million budget; subpoena powers.
• Staff of about 80
  – Max of roughly 65 at any one time, including economists, lawyers, financial analysts, accountants, journalists.
  – Detailees from Fed, SEC, OCC, FDIC, and other federal agencies.
• Research and investigation
  – Investigation teams conducted deep dives on individual institutions.
  – Research team wrote 10 public papers prior to hearings and led production of the final report.
  – All told, staff conducted more than 700 interviews and reviewed millions of documents.
• A total of six hearings:
  – Overview hearing (January 2010).
  – Subprime lending, securitization, and GSEs (April 2010).
  – The shadow banking system (May 2010).
  – Credit rating agencies (June 2010).
  – The role of derivatives (June-July 2010).
  – Too big to fail (September 2010).
• Also three expert forums (November 2009-January 2010) and four regional hearings (September 2010).
• Final report issued January 2011.
• Final home: fcic.law.stanford.edu
Ex-ante stories of the crisis

• Agreed: There was a bubble in housing which burst.

• Story 1: The mortgage shock was large and pervasive enough to be the primary cause of the crisis.
  – A. The common shock of the bursting of the housing bubble created a solvency crisis in the financial sector.
  – B. Real side effects from the bursting of the housing bubble are the main (and possibly sole) sources of the economic and financial crises.

• Story 2: The collapse of the housing and mortgage markets triggered initial losses among financial institutions, followed by liquidity runs, propagation of losses throughout the system and contagion far beyond housing.
  – Housing shock was not enough
  – Contagion hurts firms and markets with little or no mortgage exposure

• Additional Issue: Do crises just happen or was the crisis avoidable?
  – Panic was set off by unique events, but panic cannot be predicted and sufficient panic will always cause a crisis
  – It was caused by human actions and was in some ways avoidable
THE HOUSING/MORTGAGE CRISIS
Housing Crisis: Subprime Mortgages

Subprime Mortgage Originations
In 2006, $600 billion of subprime loans were originated, most of which were securitized. That year, subprime lending accounted for 23.5% of all mortgage originations.

IN BILLIONS OF DOLLARS

NOTE: Percent securitized is defined as subprime securities issued divided by originations in a given year. In 2007, securities issued exceeded originations.
SOURCE: Inside Mortgage Finance
What should we have asked in 2005?

• Not these questions: we knew...
  – Asset prices were high.
  – Underwriting standards were falling.
  – Securitization/shadow banking system were taking business from banks.
  – The market was “mispricing” risk, partly because of easy money.

• Instead we should have asked:
  – Who held the credit and liquidity risk?
  – Did they understand the risk?
  – Were they prepared to take the losses?

• We believed...
  – Securitization/shadow banking disperses risks.
  – Private markets can take care of themselves.
Housing Crisis: What went wrong?

- ‘Checks’ in the System
  - Borrowers
  - Due Diligence Process
  - Rating Agencies
  - Investors
  - Regulation / Supervision
  - Risk Management
Securitization

• Sophisticated market participants understood that the mortgage securitization market was full of froth
  – Deals were sold before mortgages were even identified

• But, not all the froth was visible
  – Only 2% to 3% of the deals were sampled in some cases
  – Even of the small samples many failing loans were discovered but “waived in”
  – These facts were not disclosed to investors
Due Diligence

### Rejected Loans Waived in by Selected Banks

*From January 2006 through June 2007, Clayton rejected 28% of the mortgages it reviewed. Of these, 39% were waived in anyway.*

<table>
<thead>
<tr>
<th>Financial Institution</th>
<th>A (Accepted Loans, Event 1 &amp; 2)/Total pool of loans</th>
<th>B (Rejected Loans, Event 3)/Total pool of loans</th>
<th>C (Rejected Loans Waived in by Financial Institutions)</th>
<th>D (Rejected Loans After Waivers, B-C)</th>
<th>E (Financial Institution Waiver Rate, C/B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citigroup</td>
<td>58%</td>
<td>42%</td>
<td>13%</td>
<td>29%</td>
<td>31%</td>
</tr>
<tr>
<td>Credit Suisse</td>
<td>68%</td>
<td>32%</td>
<td>11%</td>
<td>21%</td>
<td>33%</td>
</tr>
<tr>
<td>Deutsche</td>
<td>65%</td>
<td>35%</td>
<td>17%</td>
<td>17%</td>
<td>50%</td>
</tr>
<tr>
<td>Goldman</td>
<td>77%</td>
<td>23%</td>
<td>7%</td>
<td>16%</td>
<td>29%</td>
</tr>
<tr>
<td>JP Morgan</td>
<td>73%</td>
<td>27%</td>
<td>14%</td>
<td>13%</td>
<td>51%</td>
</tr>
<tr>
<td>Lehman</td>
<td>74%</td>
<td>26%</td>
<td>10%</td>
<td>16%</td>
<td>37%</td>
</tr>
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<td>Merrill</td>
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<td>7%</td>
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</tr>
<tr>
<td>UBS</td>
<td>80%</td>
<td>20%</td>
<td>6%</td>
<td>13%</td>
<td>33%</td>
</tr>
<tr>
<td>WaMu</td>
<td>73%</td>
<td>27%</td>
<td>8%</td>
<td>19%</td>
<td>29%</td>
</tr>
<tr>
<td><strong>Total Bank Sample</strong></td>
<td><strong>72%</strong></td>
<td><strong>28%</strong></td>
<td><strong>11%</strong></td>
<td><strong>17%</strong></td>
<td><strong>39%</strong></td>
</tr>
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**NOTES:** From Clayton Trending Reports. Numbers may not add due to rounding.  
**SOURCE:** Clayton Holdings
Selected Investors in CMLTI 2006-NC2

A wide variety of investors throughout the world purchased the securities in this deal, including Fannie Mae, many international banks, SIVs and many CDOs.

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SOURCES: Citigroup; Standard & Poor’s; FCIC calculations
Our sample deal as of September 2010

• A total of 4,499 borrowers initially
• 1,917 had defaulted (mostly in Florida and California)
• 729 had started loan modifications
• Of the 1,715 still active loans, 579 were seriously past due in their payments or currently in foreclosure process.
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Collateralized Debt Obligations

Collateralized debt obligations (CDOs) are structured financial instruments that purchase and pool financial assets such as the riskier tranches of various mortgage-backed securities.

3. CDO tranches

Similar to mortgage-backed securities, the CDO issues securities in tranches that vary based on their place in the cash flow waterfall.

1. Purchase

The CDO manager and securities firm select and purchase assets, such as some of the lower-rated tranches of mortgage-backed securities.

First claim to cash flow from principal & interest payments...

New pool of RMBS and other securities...

2. Pool

The CDO manager and securities firm pool various assets in an attempt to get diversification benefits.

High risk, high yield...
Mezzanine risk is recycled: MBS

• By 2005, CDOs were the dominant buyers of the mezzanine tranches of mortgage-backed securities (MBS) and the mezzanine tranches of other CDOs.

• Market participants and industry experts said that by 2005, CDOs were buying “virtually all” of the BBB tranches (p. 130).
Mezzanine risk is recycled: CDOs

• More than 80% of mezzanine CDO tranches were inside other CDOs by 2006.
  • Not including purchases by CDO managers intending to put tranches into CDOs.

• Only a small portion of CDOs were “CDO-squareds,” meaning that 80%-100% of their collateral was bonds issued by other CDOs.

• But most ABS CDOs had “buckets,” allowed by the credit rating agencies. Typically 10% to 15% of their collateral would be bonds issued by other CDOs.

Moody’s CDO database provided to FCIC; based on a sample set of 793 asset-backed-securities CDOs that were originated between October 1998 and February 2009. The sample is drawn from the population of active deals in Moody’s CDO Enhanced Monitoring Service database.
The CDO machine

• “We told you these bonds were a great deal... but nobody stepped up. So we created the investor.”
  – Joe Donovan, ABS CDO innovator, at a 2002 industry conference, p. 130

• “There is an awful lot of moral hazard in the sector.”
  – Scott Simon, Pimco, explaining Pimco’s decision to stop managing ABS CDOs, at a 2005 industry conference, p. 190

• “The whole concept of ABS CDOs had been an abomination.”
  – Pat Parkinson, FCIC interview, 2010, page 129
Those buying the equity tranches were also shorting (correlation trading)

• This fact was not entirely appreciated by market participants

• The market relied on those buying the equity tranches – the first loss pieces – for proper due diligence since they would be the first to lose

• These buyers often made more money if they deal performed badly

• Now, no one was conducting serious due diligence
The role of hedge funds: FCIC Hedge Fund Survey

Survey of 170 hedge funds with $1.7 trillion in assets.

Hedge Funds’ Average AUM by Quartile

Source: FCIC survey of hedge funds
The role of hedge funds: RMBS

Top Quartile Hedge Funds’ Average Long/Short Positions in Non-Agency RMBS Tranches

- Long Equity
- Short Mezzanine

Note. Many of the long/short positions described in this graph occurred within the same hedge fund, often as part of trading strategies such as the correlation trade. ‘Top quartile’ refers to the quartile of hedge funds with the highest amount of assets under management (AUM). ‘Mezzanine’ refers to lower-rated tranches still considered investment-grade.

Source: FCIC survey of hedge funds
The role of hedge funds: CDOs

In the second half of 2006, more than half of CDO equity tranches
CDS, Synthetic CDOs and Amplification

• CDS allowed additional ‘bets’ on the mortgage market.
  – Synthetic CDOs created by Goldman referenced 3,408 mortgage securities, some of them multiple times. For example, 610 securities were referenced twice. One single MBS tranche was referenced in nine times.

• CDS form the underlying assets/structures for synthetic CDOs.
  – Source of many of accusations of fraud, self-dealing, bad behavior.

• Many of the super-senior positions were retained at places like Merrill and Citi.
AAA risk is retained

• “It wouldn’t have been useful for someone to come to me and say, ‘Now, we have got $2 trillion on the balance sheet of assets. I want to point out to you there is a one in a billion chance that this $40 billion could go south.’ That would not have been useful information. There is nothing I can do with that, because there is that level of chance on everything.” Chuck Prince, CEO and Chairman of Citigroup

• Chance of a AAA CDO becoming impaired in five years pre-crisis: 10% (Moody’s)

• Chance of a AAA CDO becoming impaired in five years post-crisis: more than 50%.

• Merrill CEO O’Neal said he had not known that the company was retaining the super-senior tranches of the CDOs until summer of 2007. He had been under the impression that Merrill’s mortgage-backed-assets business had been driven by demand: he had assumed that if there were no new customers, there would be no new offerings.
The Housing Crisis: What was toxic?

**Impaired Securities**

Impairment of 2005-2007 vintage mortgage-backed securities (MBS) and CDOs as of year-end 2009, by initial rating. A security is impaired when it is downgraded to C or Ca, or when it suffers a principal loss.

**In Billions of Dollars**

<table>
<thead>
<tr>
<th>Security</th>
<th>Aaa</th>
<th>Aa thru B</th>
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THE FINANCIAL CRISIS
The Financial Crisis: Part IV of the Final Report

• Early 2007: Spreading subprime worries
• Summer 2007: Disruptions in funding
• Late 2007 to early 2008: $Billions in subprime losses
• March 2008: The Fall of Bear Stearns
• March to August 2008: Systemic Risk Concerns
• September 2008
  – Fannie and Freddie
  – Lehman
  – AIG
  – Crisis and Panic
Losses should not have been large enough to threaten the system

- Losses from housing wealth similar in magnitude to losses from dot-com bubble bursting.
- Of the $17 trillion lost from 2007 to the first quarter of 2009 in household net wealth, about $5.6 trillion was due to declining house prices, with much of the remainder due to the declining value of financial assets.
- The amount of wealth lost in the dot-com crash was $6.5 trillion, with far fewer repercussions for the economy as a whole.
- Need additional effects of leverage to make losses from housing wealth matter to financial system
- Whose leverage?
Facts that suggest housing wasn’t enough

• Institutions with little mortgage exposure (even short) nearly failed such as Goldman Sachs

• Markets with little mortgage exposure suffered such as Auction Rate Securities

• Runs occurred in investments that were unrelated to mortgage market such as Structured Investment Vehicles
The changing financial market

- Shadow banking, particularly repo and asset-backed commercial paper, had come to finance much of the mortgage securitization markets.
- These markets were characterized by light regulation and the lack of an official backstop, with critical support instead provided by traditional banks, both transparent and otherwise.
- Assumption that they could handle stress:
  - Previous episodes like LTCM/Asia crisis had promoted Greenspan’s “spare tire theory.”
  - Markets handled failure of Drexel Burnham; investment banks weren’t seen as systemic.

**Asset-Backed Commercial Paper Outstanding**

*At the onset of the crisis in summer 2007, asset-backed commercial paper outstanding dropped as concerns about asset quality quickly spread. By the end of 2007, the amount outstanding had dropped nearly $400 billion.*

**Repo Borrowing**

*Broker-dealers’ use of repo borrowing rose sharply before the crisis.*

IN BILLIONS OF DOLLARS

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
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<tbody>
<tr>
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<td>$1,000</td>
<td>$750</td>
<td>$500</td>
<td>$250</td>
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<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>

NOTE: Seasonally adjusted
SOURCE: Federal Reserve Board of Governors

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</tr>
</thead>
<tbody>
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<td>$1,200</td>
<td>$900</td>
<td>$600</td>
<td>$300</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>

NOTE: Net borrowing by broker-dealers.
SOURCE: Federal Reserve Flow of Funds Report
Changes in Financial Intermediation

- Laws allowed traditional banking sector to get into lines of business to compete with shadow banks
- Capital standards encourage securitization
- Capital standards encourage off balance sheet activities
  - Hidden liabilities
  - Liquidity back stops
The Financial Crisis: The Shock

• Bank runs – first in SIVs, then ARS, then Bear, then Lehman, then ....
• Even those not affected worried they might be affected in the future – precautionary hoarding
• Don’t sell mortgage assets – have to remark your whole book
• Sell your Treasuries and other low risk assets
• Prices of low risk assets fall.
• No market for mortgage assets
The Financial Crisis: Interbank Worries

Cost of Interbank Lending

As concerns about the health of bank counterparties spread, lending banks demanded higher interest rates to compensate for the risk. The one-month LIBOR-OIS spread measures the part of the interest rates banks paid other banks that is due to this credit risk. Strains in the interbank lending markets appeared just after the crisis began in 2007 and then peaked during the fall of 2008.

IN PERCENT, DAILY

4%

NOTE: Chart shows the spread between the one-month London Interbank Offered Rate (LIBOR) and the overnight index swap rate (OIS), both closely watched interest rates.

SOURCE: Bloomberg
The Financial Crisis: The Bear run

**Bear Stearns Liquidity**

*In the four days before Bear Stearns collapsed, the company’s liquidity dropped by $16 billion.*

**IN BILLIONS OF DOLLARS, DAILY**

| Date       | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|------------|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**SOURCE:** Securities and Exchange Commission
Post-Bear: Systemic risk concerns

• The run on Bear was a wake-up call about the repo and derivatives markets.
• Repo market not well understood
  – Despite 2005 Bankruptcy Act protections, investors didn’t want the collateral.
  – Some investors had been lending on collateral they couldn’t legally own.
  – Growing concerns over the spring and summer about intraday credit risk for triparty repo clearing banks.
• OTC derivative exposures not known
  – Part of the run on Bear was by derivatives counterparties.
• Fed response
  – Liquidity programs to back repo market – but not intraday
  – Onsite presence at remaining investment banks; work with SEC on more rigorous liquidity stress tests.
  – Lehman, Merrill quickly identified as relatively weak.
Hedge Fund Redemptions

Index of Average Level of Redemption Requests as a Percent of Assets Under Management

Note. Data points represent a composite index of average redemptions requested across all hedge fund quartiles. Exact redemption amounts across all respondents cannot be determined from this index. Survey did not capture data from hedge funds that closed before 2010.

Source. FCIC survey of hedge funds.
The Financial Crisis: Lehman Collapse

Money market funds pulled $165 billion out of commercial paper in September.
Prime Brokerage Balances

Hedge Fund Average Long Balance at its Top Prime Broker
(Pre-crisis Ranking)

Note. Top quartile’ refers to the quartile of hedge funds with the highest amount of assets under management (AUM). ‘Top Prime Broker’ refers to the prime broker with which each fund did the most business as of January 1, 2007.
Source: FCIC survey of hedge funds
Repo Haircuts

Average Repo Haircuts by Hedge Fund Quartile

Note. Data points reflect transactions where hedge funds receive cash in exchange for posting securities. Largest hedge funds are counted in the top quartile.

Source: FCIC survey of hedge funds
Hedge Funds’ Average Bilateral Repo Market Borrowing by Quartile

Note. Hedge funds were ordered by assets under management (AUM). Largest hedge funds are counted in the top quartile. Amounts do not include reverse repo contracts.

Source: FCIC Survey of hedge funds
Primary Dealer Repo Borrowing

Average Net Repo Borrowing by Primary Dealers

Note. Net repo borrowing is total repo positions less reverse repo positions.
Source: FCIC Market Risk Survey
‘Cliff Effect’ in the Repo Market

Average Money Fund Repo Lending to Selected Institutions

Source: FCIC Market Risk Survey
Repo Lending at Fidelity

Repo Market Lending to Selected Institutions by Fidelity Money Market Funds

Source: Firm-level responses to FCIC Market Risk Survey.
Financial Crisis: Risk management

• At many firms, senior management was not fully aware of the risks within their firms:
  • AIG and collateral calls
  • Citi and full exposure to subprime
  • Countrywide and growing mortgage risk

• Different divisions within organizations were not sharing information/views on the market.
  • Citi mortgage vs. Citi CDO desks

• “Those of us who looked to the self-interest of lending institutions to protect shareholders’ equity, myself included, are in a state of shocked disbelief.” Alan Greenspan, October 2008

• Warren Buffett, one of Moody’s largest shareholders, claimed to know nothing about Moody’s operations. Invested because Moody’s had pricing power.
Financial Crisis: Supervision

• Supervisory system also failed.
  • Gaps in regulatory framework:
    – No supervision of independent mortgage companies
    – “Issues” around non-bank mortgage subsidiaries
    – AIG is overseen by NYS Ins regulator; Ambac and MBIA by Wisc and MD;
  • Competition among regulators
    – Countrywide converts from Fed to OTS supervision
    – Consolidated supervision – OTS, SEC, FED
  • Less than perfect coordination among regulators
    – OTS delays in Non-traditional mortgage guidance
Took on more risk in ways that were completely visible / deliberate

• Self regulation
• Complexity
• Liquidity risk
• Firm size
• Leverage
• Moving to storage
• Credit Rating Agencies
• Underpricing of risk
What we didn’t see

• Failed to appreciate that the traditional banking sector and the shadow banking sector had become very similar (helped by new regulations). They could no longer bail each other out.

• Failed to see that firms did not understand their own risks

• Failed to see that risky mortgage had become central in overnight lending markets

• Failed to see that the CDO market was a mess
Ex’s of firms not appreciating risks

• AIG and collateral calls in contracts
• AIG and securities lending
• Co-head of Citigroup’s investment bank said he spent “a small fraction of 1%” of his time on MBS.
• Citigroup and poor communication
• Merrill and $55 billion in subprime mortgage exposure
Housing Crisis: Home Prices

U.S. Home Prices
INDEX VALUE: JANUARY 2000 = 100

NOTE: Sand states are Arizona, California, Florida, and Nevada.
SOURCE: CoreLogic and U.S. Census Bureau: 2007 American Community Survey, FCIC calculations
Housing Crisis: GSEs vs. subprime

**Loan Performance in Various Mortgage-Market Segments**

Bars show distribution of average rate of serious delinquency.

<table>
<thead>
<tr>
<th>IN PERCENT</th>
<th>MIDDLE 50%</th>
<th>MIDDLE 90%</th>
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<tbody>
<tr>
<td>2008</td>
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<tr>
<td>GSE</td>
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<tr>
<td>FHA</td>
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</tbody>
</table>

**NOTE:** Serious delinquencies include mortgages 90 days or more past due and those in foreclosure.  
**SOURCE:** FCIC calculations, based on CoreLogic and Loan Processing Service Inc.
Housing Crisis: GSEs in the private MBS market

- The GSEs purchased mostly AAA tranches of MBS; they did not buy CDOs.
- They were a major supplier of liquidity to the market but they did not drive the market.
Housing Crisis: Low Rates

Bank Borrowing and Mortgage Interest Rates

Rates for both banks and homeowners have been low in recent years.

IN PERCENT

SOURCE: Federal Reserve Bank of St. Louis. Federal Reserve Economic Database
Housing Crisis: Refi Boom

Figure 2
Purpose of Mortgage Originations

- Home Purchase Loans
- Home Improvement Loans
- Refinance Loans

Number (millions)

Source: Home Mortgage Disclosure Act (HMDA)
Selected Financial Intermediation Entities and Debt Instruments

Users of funds
- Liabilities
  - Households
    - Loans
    - Mortgages
  - Corporations
    - CP
    - Loans
    - Notes
    - Bonds
  - Municipalities
    - CP
    - Notes
    - Bonds
  - MBS, CDO, and securitization structures
    - Loans
    - Notes
    - Bonds
    - Mortgages
  - ABCP Conduits
    - Loans
    - Notes
    - ABCP
    - Mortgages
  - SIVs
    - Loans
    - Notes
    - ABCP
    - Mortgages

Intermediaries
- Depository institutions
  - Assets
    - Loans
    - Mortgages
  - Liabilities
    - Deposits
    - Notes
    - Bonds
  - MMFs
    - Repo, CP, ABCP
    - MMF shares
- Finance Companies
  - Assets
    - Loans
    - CP
    - ABCP
  - Liabilities
    - CP
    - Notes
    - Bonds
  - Other funds
    - Repo, CP, ABCP
    - Notes
    - CP
    - Bonds
    - Other shares
- Investment banks
  - Assets
    - Loans
    - Repo
  - Liabilities
    - Notes
    - CP
    - Bonds
    - Other shares

Providers of funds
- Assets
  - Households
    - Deposits
    - MMF shares
    - Other shares
  - Corporations
    - Deposits
    - MMF shares
    - Other shares
  - Municipalities
    - Deposits
    - MMF shares
    - Other shares

Note. Other funds include securities lending cash reinvestment pools, hedge funds, mutual funds, government investment pools, and other asset managers. CP refers to unsecured commercial paper. Notes are medium-term debt instruments; bonds are long-term debt instruments. Importantly, this figure does not represent all instruments and entities. For example, not included in this diagram are equity securities or securities directly held by households, corporations, and municipalities. Source: Pozsar, 2008.