FEDERAL RESERVE BANK of NEW YORK

Shadow Banking and Financial Stability

Tobias Adrian, November 8, 2013

Shadow Bank Monitoring

- Shadow banking refers to credit and liquidity transformation outside of core depository institutions
- Shadow bank monitoring is challenging as data is often incomplete
- Many shadow banking activities occur in the market place
- I illustrate shadow bank monitoring efforts with examples explaining:
  - Economics of the shadow banking activity
  - Risks of the activity
  - Policies to mitigate the systemic risks emanating from the activity
- Source: Adrian, Ashcraft, Cetorelli (2013) “Shadow Bank Monitoring”

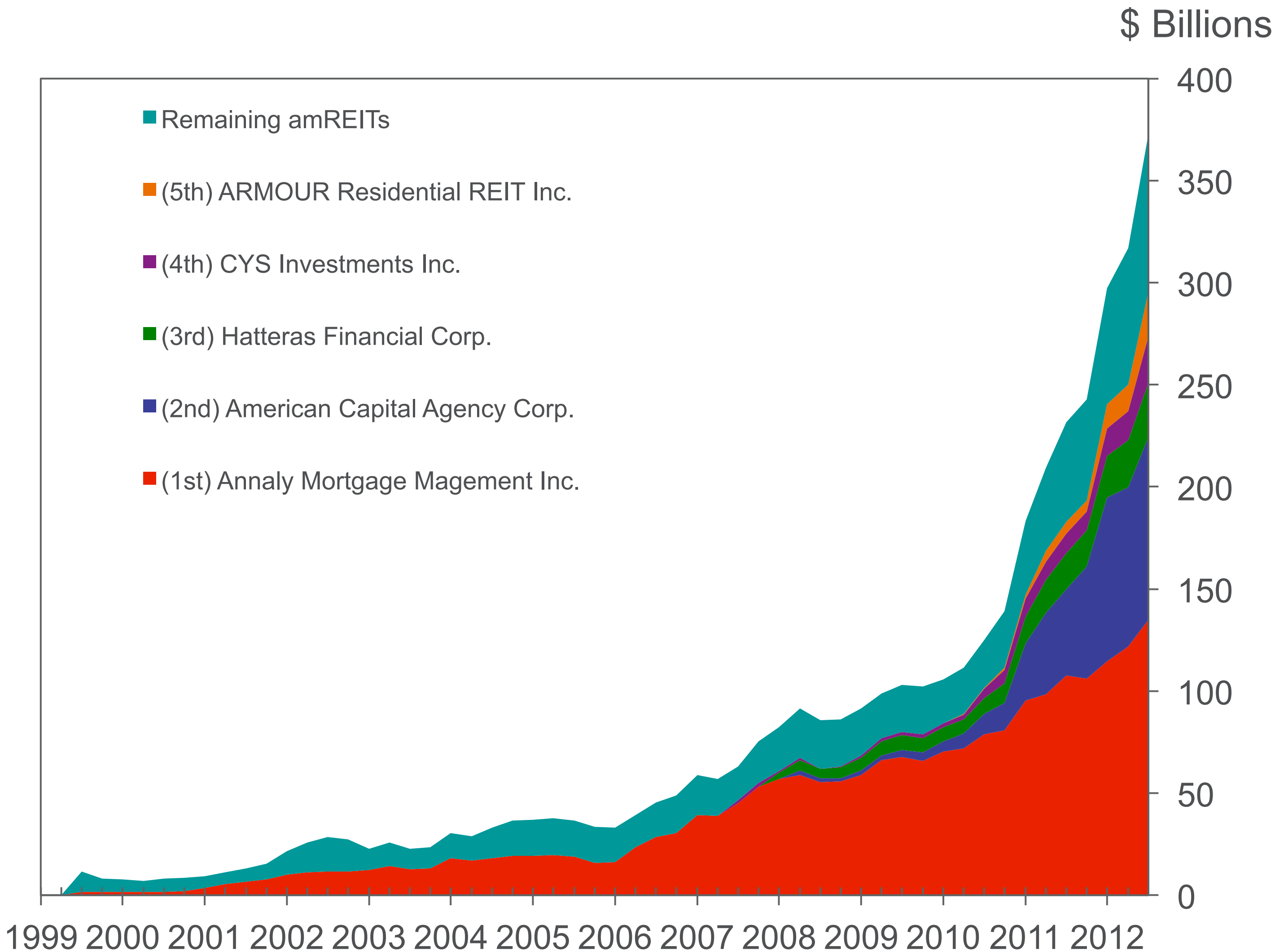
  http://www.newyorkfed.org/research/staff_reports/sr638.pdf

Example 1: Agency REITs

Example 2: Leveraged Finance

Example 3: Reinsurance

Agency MBS Holdings of Agency Mortgage REITs

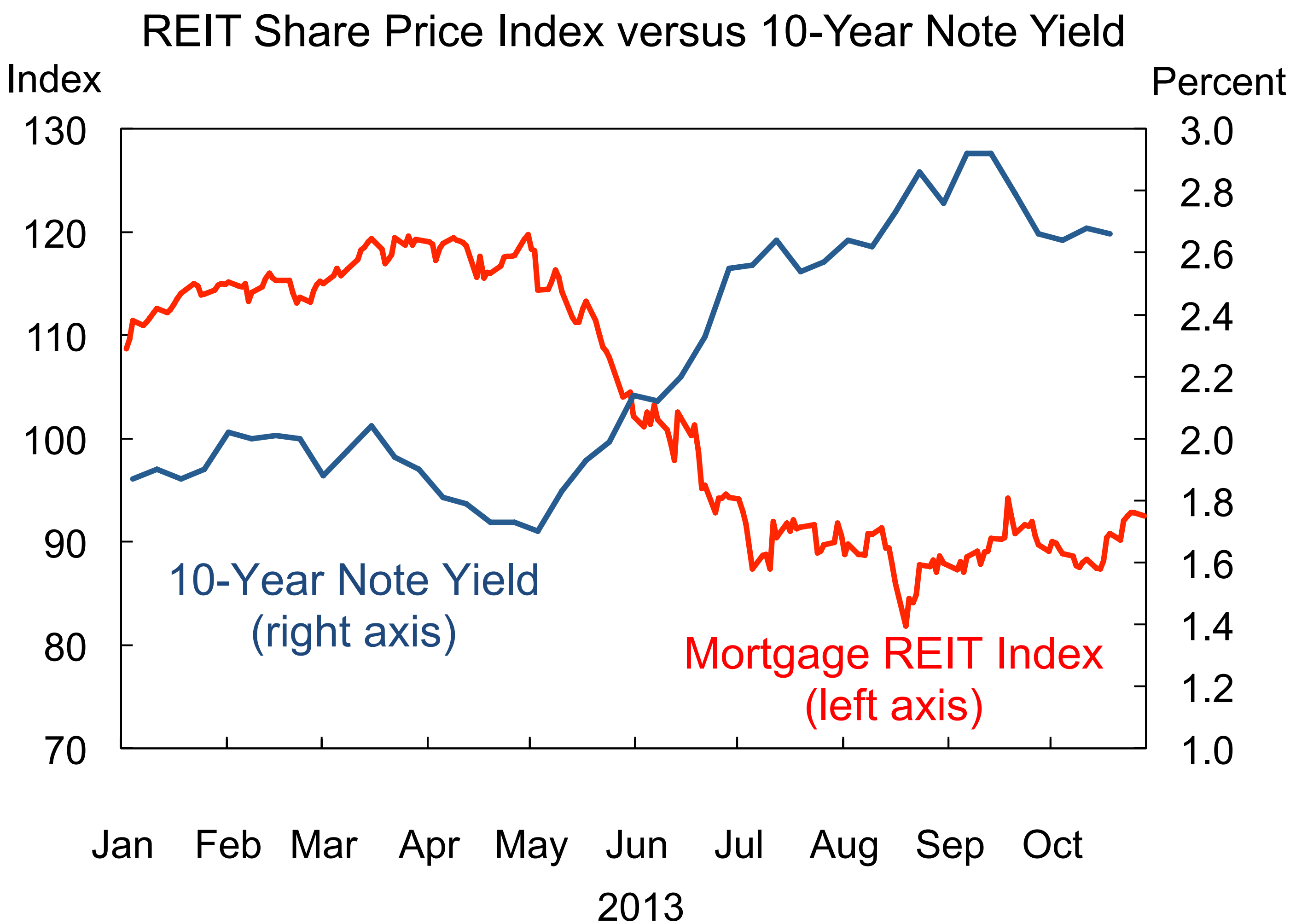


Source: SEC 10K and 10Q filings

Economics of REITs

- Primarily invest in agency MBS issued by U.S.
- Subject to SEC's investor protection rules
  - But no prudential regulation
- Rely on liquidity and leverage, but not credit transformation:
  - Obtain leverage in bilateral repo market from dealers
  - Leverage of REITs tends to be far below the maximum possible leverage implied by haircuts
  - Leverage currently around 10, pre-crisis around 15

Agency REIT during this year's selloff



Source: Federal Reserve Board

Agency REITs Risk

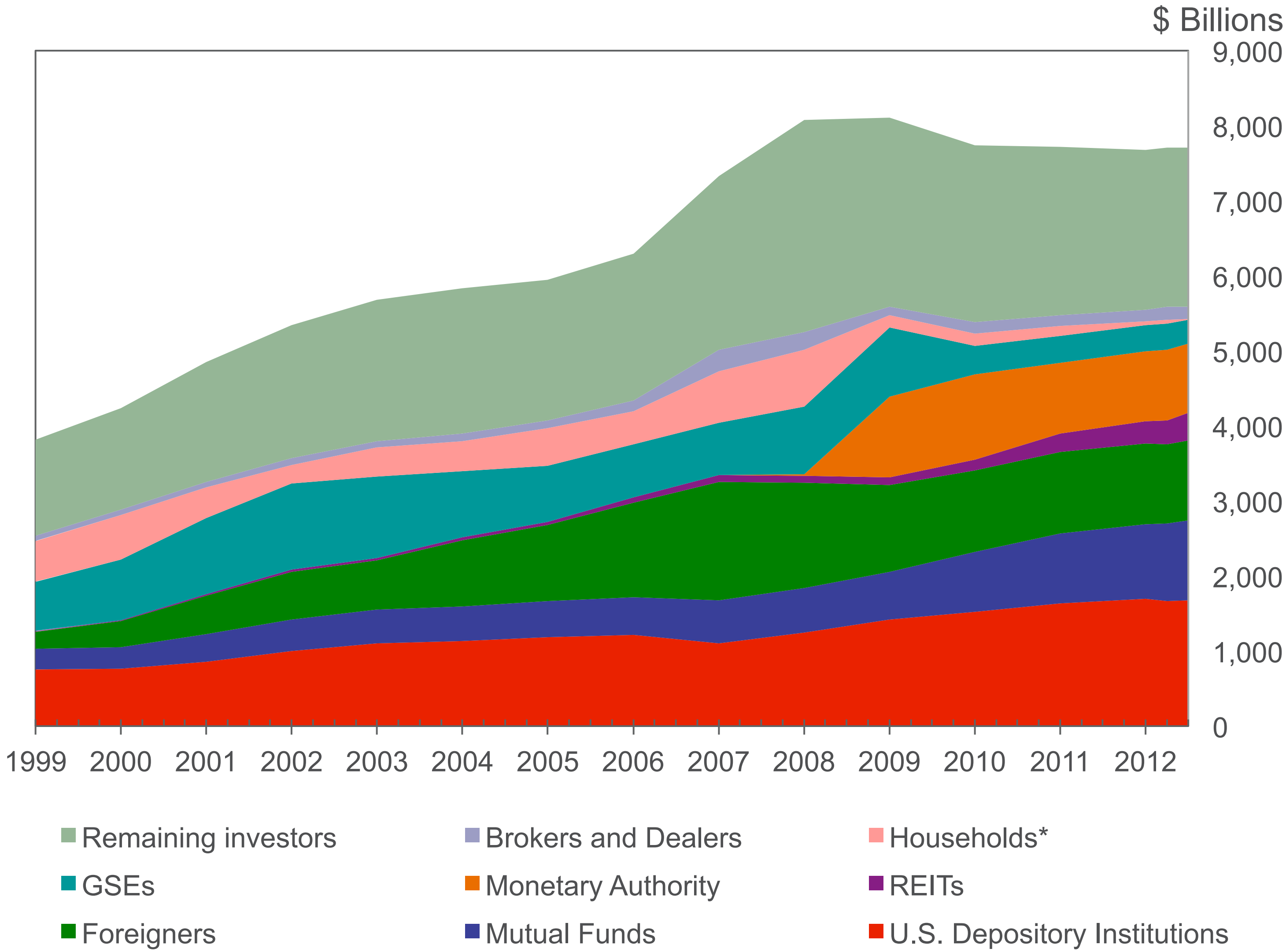
- Duration risk: long term assets (MBS), short term liabilities (repos)
  - REIT earnings tightly linked to slope of the yield curve (carry)
  - Steepening slope generates mark to market losses
- Liquidity risk arises due to liquidity transformation
  - Agency MBS became illiquid in 2008
  - Risk of forced deleveraging due to haircut spiral
- Contagion to dealers:
  - Fire sales of REITs might spill over to dealers

Agency Mortgage REIT Holdings and Dealer Inventories

	2007	2008	2009	2010	2011	2012
REIT	88.9	89.6	105.1	143.3	239.1	368.2
Broker-Dealer	290.2	242.6	110.9	149.8	166.8	165.5
Ratio	0.3	0.4	0.9	1	1.4	2.2

Source: Flow of Funds

Agency Holdings by REITs are Small



Source: Flow of Funds

Financial Stability Policies

- Forced deleveraging potentially generates
  - Fires sale externalities, convexity risks, haircut spiral
- Financial stability policy options:
  - Minimum haircuts as discussed by the FSB
  - Enhanced data and risk disclosure by FSOC/OFR
    - DFA authorizes collection of data by entities that are not otherwise subject to prudential regulation
  - Indirect supervision via BHC affiliated dealers
    - But REITs can obtain leverage from dealer subs outside the US

Example 1: Agency REITs

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Example 3: Reinsurance

Leveraged Loans

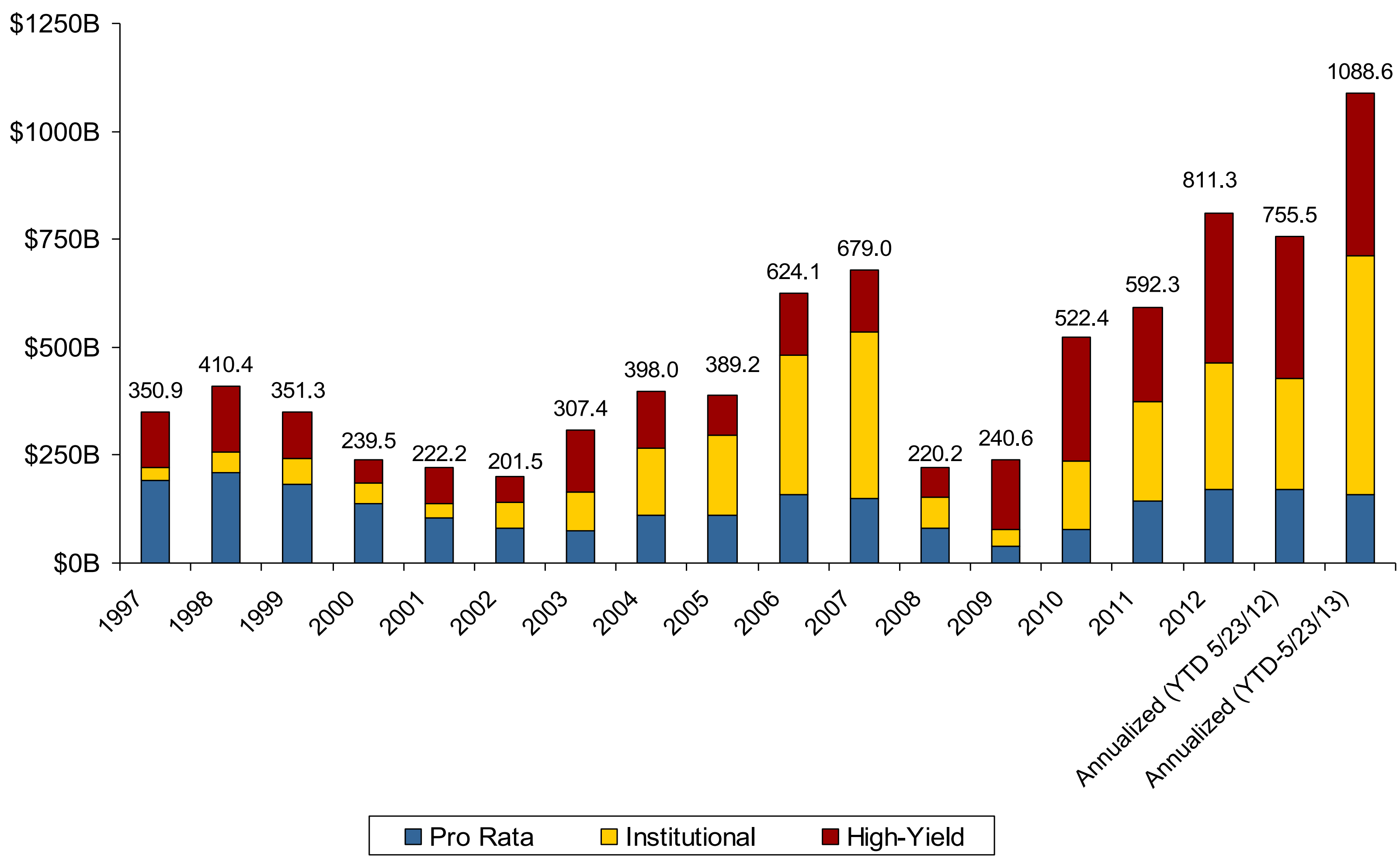
- Loans to firms with non-investment grade credit ratings:
  1. Corporate lending to fund investments
  2. Event-driven financing, e.g. leveraged buyouts

- Typical structure of leveraged loans:
  - five to seven year
  - floating-rate balloon loans with limited amortization
  - performance highly dependent on refinancing conditions

- Defaults highly sensitive to macro conditions:
  - Defaults vary from 1 to 12 percent annually
  - Recoveries on loans are generally much higher than on bonds due to seniority and collateral of the lender

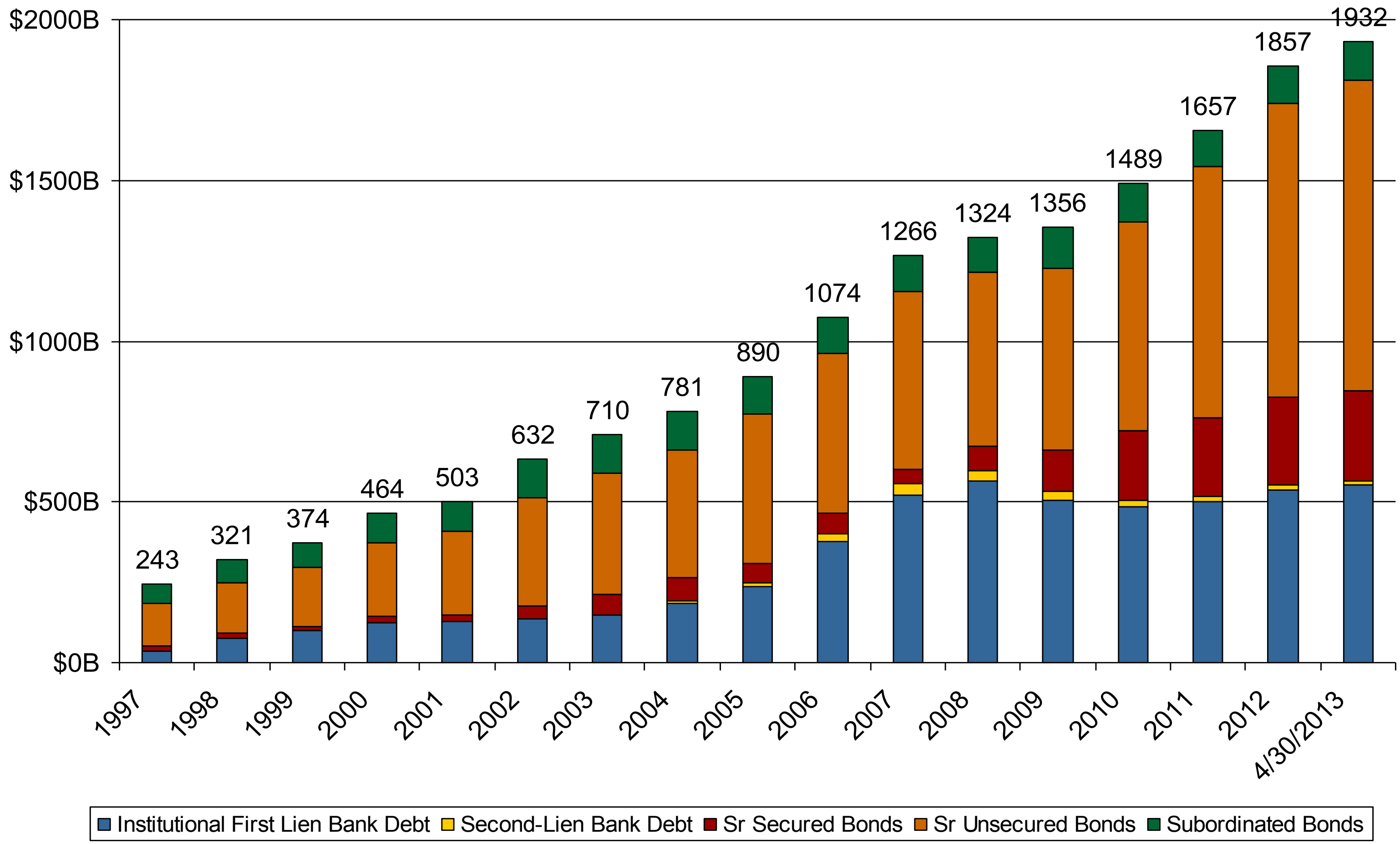
Leveraged Loan Volume

US Volume



Total Leveraged Debt Outstanding

Source: Bank of America/Merrill Lynch Global High-Yield Strategy and S&P Capital IQ LCD
As of 4/30/13



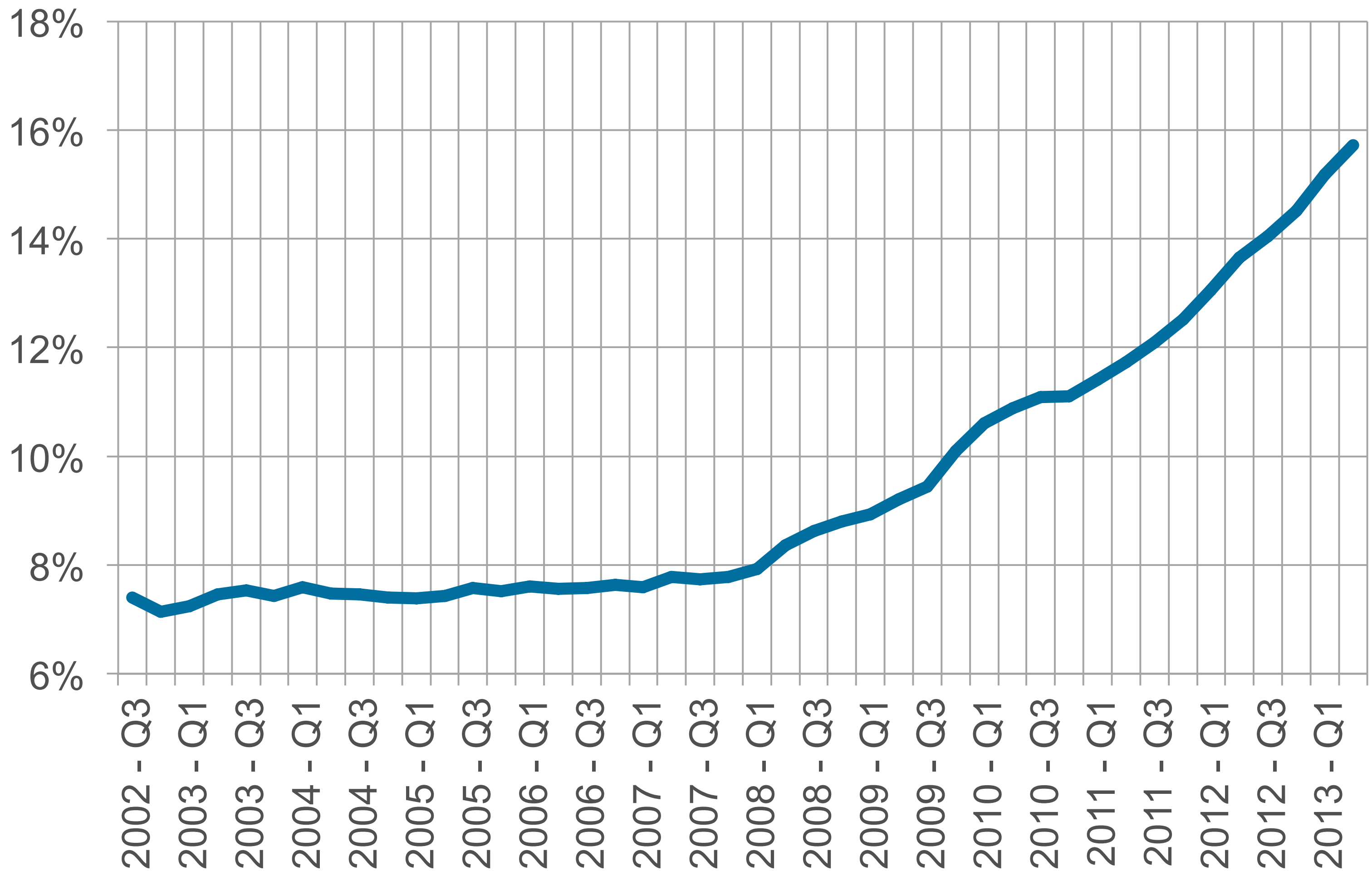
Leveraged Lending since the Crisis

- Leveraged lending collapsed in 2008
- Rebounded very quickly
- Now at record levels of volume projected above $1 trillion in 2013
- Volume largely due to refinancing in low rate environment
- LBO activity has remained muted
- Credit metrics of LBOs have not deteriorated

Covenant Lite Loans and Loan Mutual Funds

- Significant increase in covenant lite loans
  - From 0% in 2010 to 60% in 2013
- Increased presence of retail investors through CLOs and funds
  - Sophisticated investors like banks and hedge funds are exiting
- Shadow credit intermediation as leveraged loans are funded through mutual funds and ETFs
  - Funds engage in liquidity and maturity transformation

Corporate Bond Ownership by Mutual Funds and ETFs



Source: Flow of Funds

Policy Options for the Leveraged Loan Market

- Regulatory guidance on leveraged lending by banking regulators
  - Guidelines aim at excessive leverage, limited amortization, and over-reliance on refinancing
  - Risk management guidelines limit overall risk taking and pipeline and commitment risk for the aggregate book and limit individual borrower concentration
  - Banks must stress test both the pipeline and retained portfolio, and hold adequate capital against all positions
- Underwriting standards apply both to loans intended for distribution as well as for the bank's own portfolio
  - Limit on system wide risk via regulatory guidance

http://www.federalreserve.gov/bankinforeg/srletters/sr1303.htm

Example 1: Agency REITs

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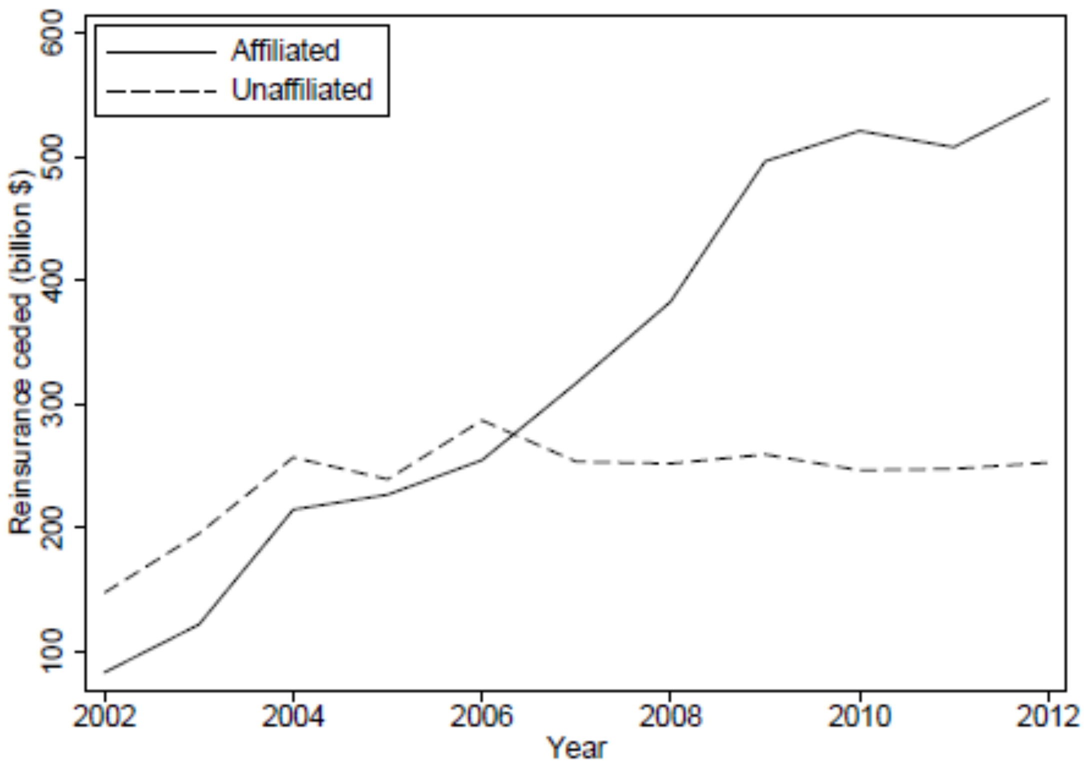
Example 3: Reinsurance

Reinsurance

- Reinsurance is the sale of risk from an insurance company to a reinsurance company
- Motivations for reinsurance:
  1. Helps an insurer avoid concentrations in its own portfolio relaxing regulatory and economic capital constraints
  2. Gains from trade:
     - Reinsurers tend to have more expertise, better diversification, and better funding access
     - Reinsurers face lower taxes and lower regulatory costs, exhibit greater risk appetite
  3. Solicitation of third-party evaluation and pricing of risk can supplement the insurer’s own evaluation and pricing

Reinsurance Ceded by U.S. Life Insurers



This figure reports life and annuity reinsurance ceded by U.S. life insurers to affiliated and unaffiliated reinsurers. Reinsurance ceded is the sum of reserve credit taken and modified coinsurance reserve ceded.

Moto and Kojen (2013) http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2320921

Regulatory Arbitrage via Captive Reinsurance

- Insurance company purchases reinsurance from an affiliate
- Captives are subject to different accounting rules:
  - Lower reserve requirements
  - No regulatory capital requirements
  - No restrictions on assets permitting greater risk and less liquidity
  - Weaker transparency requirements limiting market discipline
  - Insurance companies are able to back reinsurance with low cost letters of credit or parental guarantees instead of capital
- In typical captive insurance arrangement, risk is simply transferred from the insurance company to the parent, which reduces the insurance company's regulatory capital requirements
- The arrangement permits the consolidated organization to evade regulatory capital requirements, and instead face market capital requirements by investors and credit rating agencies on the parent

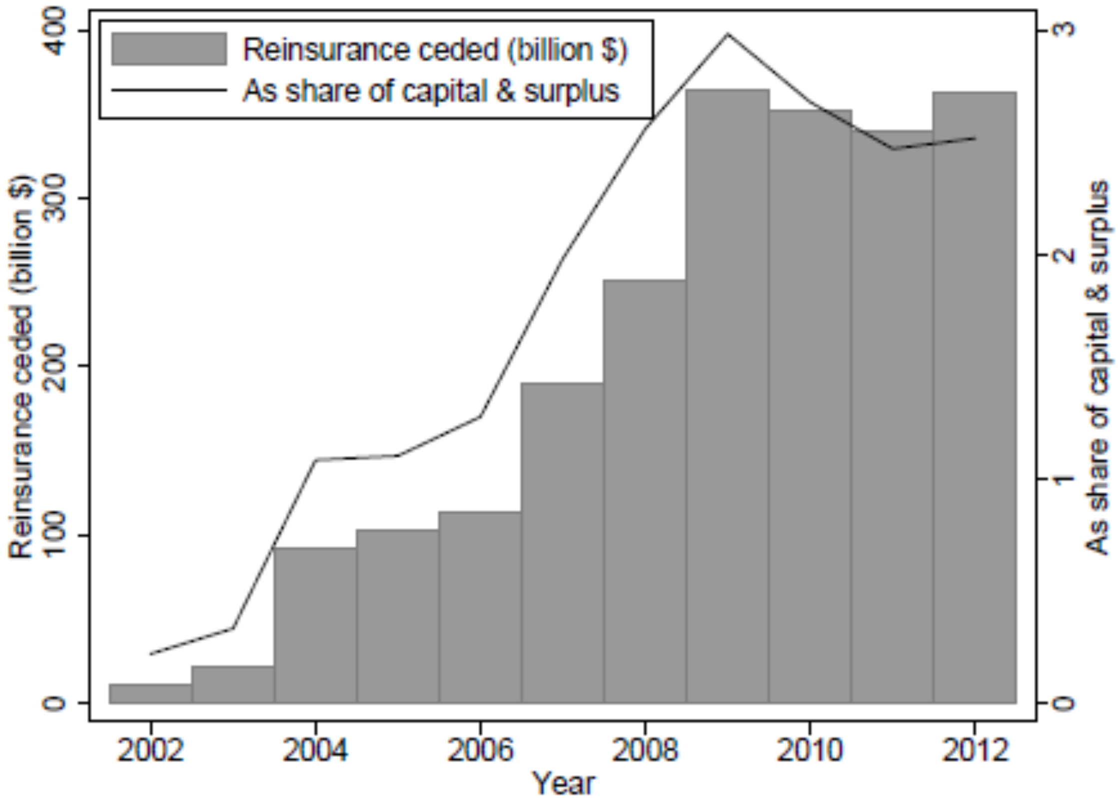
Captive Reinsurance Regulation

- Insurance company regulators have the authority to reject transactions with a captive
  - But there is no consolidated regulation at the holding company
  - Captives tend to be approved as insurance sub is less risky

- Insurance companies argue that regulation is excessive
  - Require holding reserves above the actuarial risk
  - Captive insurance is used to reduce the cost of regulation

- Captive reinsurance helps to protect the insurance company from the capital market volatility of variable-rate annuities
  - Insurer provides guaranty on the principal value of these investments, they are required to increase reserves when the market value of those investments declines in value, which reduces earnings and capital of the insurance company

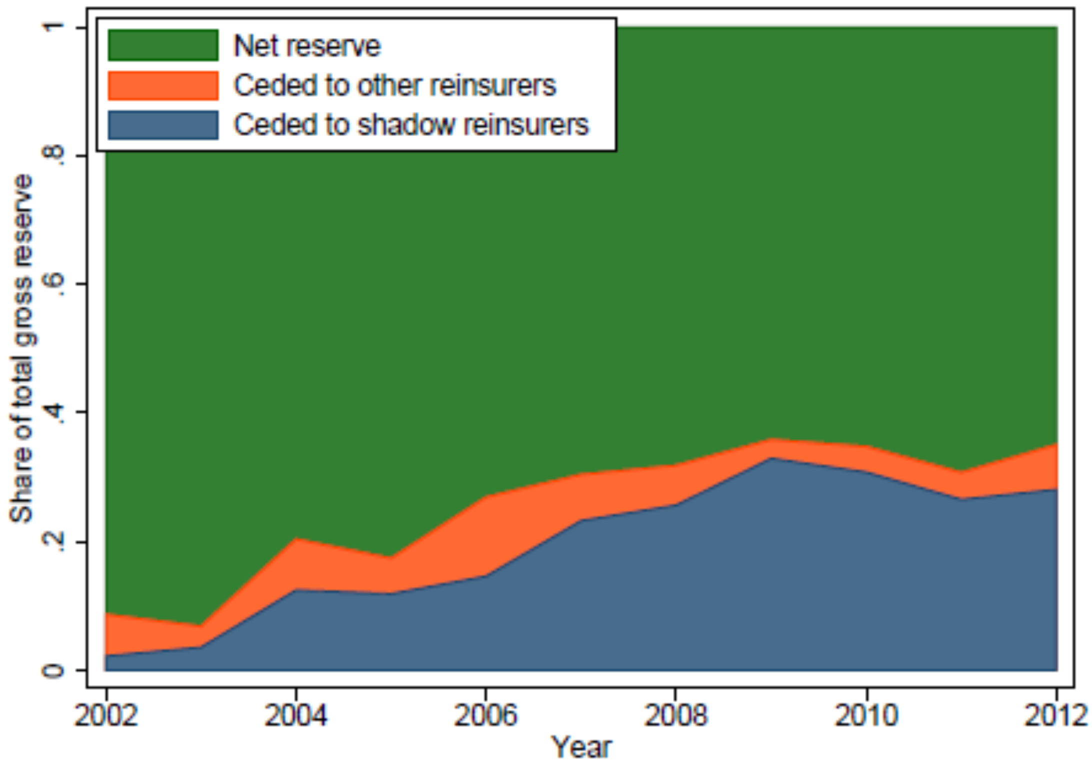
Reinsurance Ceded to Shadow Reinsurers



This figure reports life and annuity reinsurance ceded by U.S. life insurers to shadow reinsurers, both in total dollars and as a share of the capital and surplus of the ceding companies. Shadow reinsurers are affiliated and unauthorized reinsurers without an A.M. Best rating. Reinsurance ceded is the sum of reserve credit taken and modified coinsurance reserve ceded.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2320921

Growing Share of Shadow Reinsurance



Decomposition of Gross Reserve for Companies Ceding to Shadow Reinsurers
This figure decomposes gross life and annuity reserves into reinsurance ceded versus net reserves held, for operating companies that are ceding reinsurance to shadow reinsurers. Shadow reinsurers are affiliated and unauthorized reinsurers without an A.M. Best rating.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2320921

Shadow Insurance Regulatory Challenges

- The New York State Department of Financial Services recently issued a report highlighting findings from a reinsurance captives noting broader financial stability concerns, and calling for a moratorium on new activity
- Regulators note significant volume of activity, significant reductions in regulatory capital ratios, inconsistent and incomplete disclosure to the market and regulators, and evidence of a regulatory race to the bottom
- NYS is working on disclosure requirements for captives of New York based insurers and their affiliates and is pressing the National Association of Insurance Commissioners to develop enhanced disclosure requirements for all jurisdictions

http://www.dfs.ny.gov/reportpub/shadow_insurance_report_2013.pdf

Conclusion

- Shadow bank intermediation is evolving rapidly
  - The institutions reviewed here weren’t a concern five years ago
  - Many pre-crisis activities ceded to exist

- Financial stability policies to mitigate shadow banking risks emerge
  - FSOC has significantly expanded regulatory reach
    - SIFI insurance companies face consolidated supervision
  - Macroprudential policies essential
    - Leveraged lending guidance applies to securities for sale
    - Considerations about minimum haircuts take system view

- Data limitations remain a challenge, mitigated by OFR