Systemic vs. Liquidity Risk: Discussion

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Liquidity Risk, Systemic Risk, and Market Risk
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Financial Crisis and Systemic Risk

Financial crisis:

- Prices of risky assets drop sharply
- Prices of safe assets increase (flight to quality)
- Asset price volatility increases
- Liquidity dries up (increase in bid-ask spread and price impact)
- Some financial institutions might become **financially distressed**

Financial systemic risk:

- Refers to a financial crisis in which **many** institutions become financially distressed, with a potential impact on **real economic activity**

Financial distress does not mean systemic risk!

- Amaranth versus LTCM
- Refco versus Drexel

Systemic Risk and Financial Institutions

Who is holding what matters!

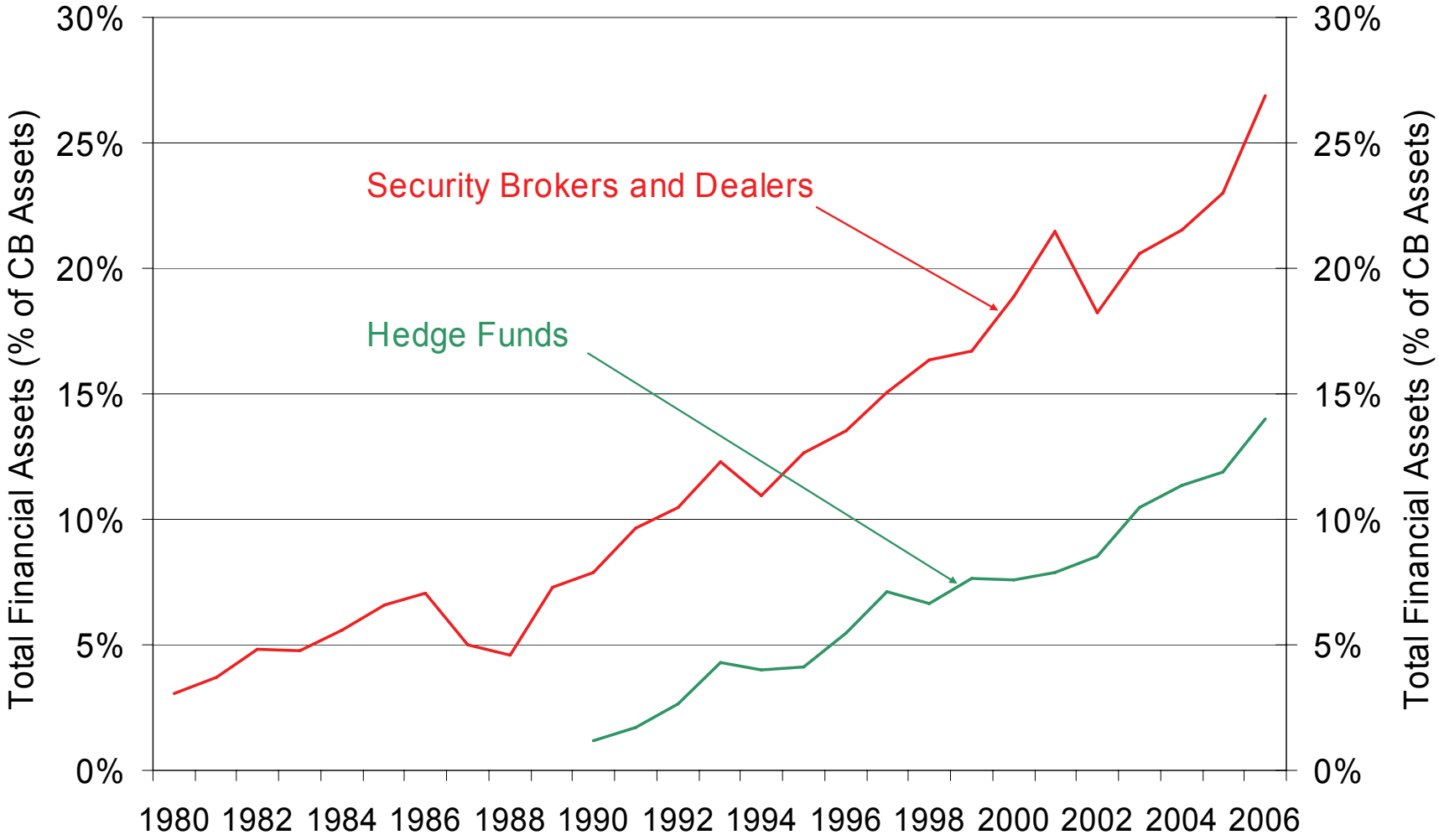
- What matters for both liquidity and systemic risk is who is exposed to what risks:
  - Are risk exposures highly correlated across financial institutions?
  - Are risks concentrated in "weak" balance sheets?
  - Who are the natural liquidity suppliers in different crises?

- Liquidity providers in "normal" times can drain liquidity in crisis
  - Buy side and investment banks in 1987 crash
  - Hedge funds and banks in LTCM crisis
  - But not much happens if exposures offset each other: Amaranth, Refco.

- Who are the major players?

Total Assets of Financial Intermediaries

as % of Commercial Bank Total Assets



Source:
Total financial assets of Security Brokers and Dealers are from table L.129 of the Flow of Funds, Board of Governors of the Federal Reserve.
Total financial assets of Commercial Banks are from table L.109 of the Flow of Funds, Board of Governors of the Federal Reserve.
Assets Under Management of Hedge Funds are from HFR.

How do different institutions behave during crisis?

Commercial banks (Adrian, Mahoney and Wang 2006)

- Have access to the discount window
- Have a large balance sheet due to loan portfolio
- But: capital budgeting / risk management within the bank

Investment banks (Adrian and Shin 2006, 2007)

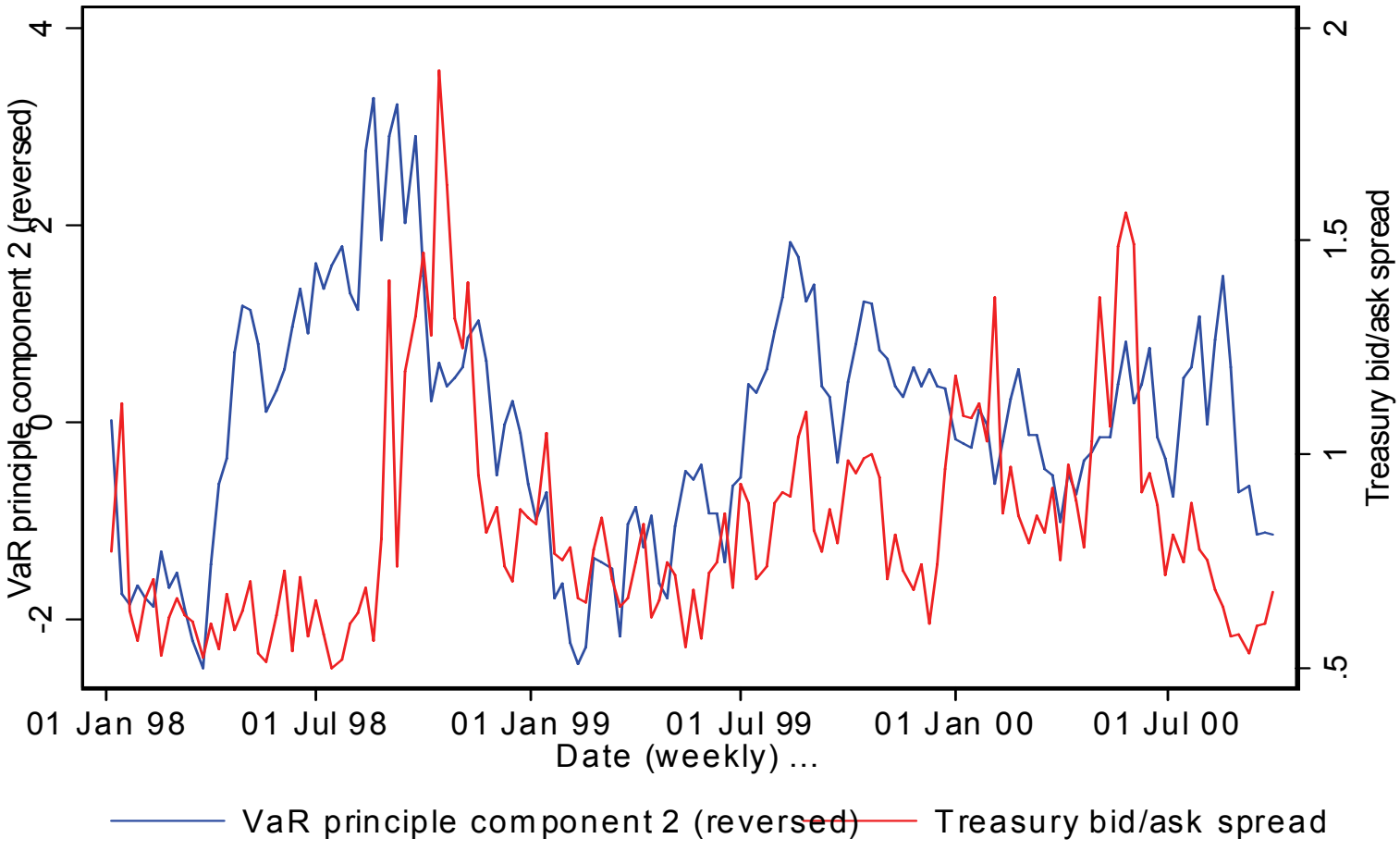
- Balance sheet primarily consists of tradable assets
- Highly leveraged (typically 25-1)
- But: manage leverage

Hedge funds (Adrian 2007, Adrian and Brunnermeier 2007)

- Some hedge funds are highly leveraged (e.g. fixed income arbitrage)
- Leverage can lead to financial distress
- Holding tail risk generates returns …

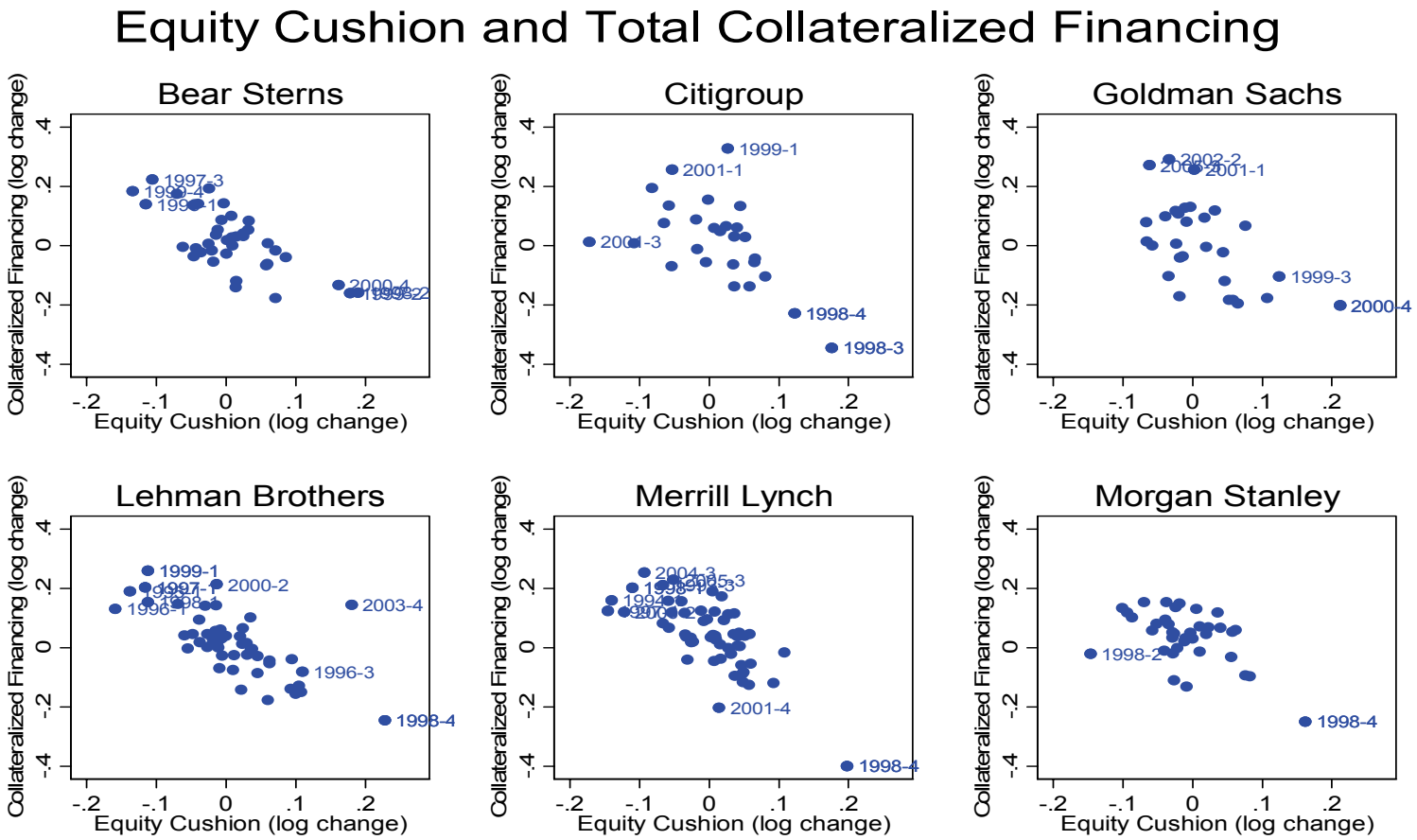
Commercial banks and the fall 1998

- Adrian, Mahoney, Wang (2006) look at the cross section of VaRs of banks 1998-2000
- Strong relation between the Principle Components of the VaRs and market liquidity
- Story: institutions that provide liquidity in normal times but started to drain liquidity in the crisis



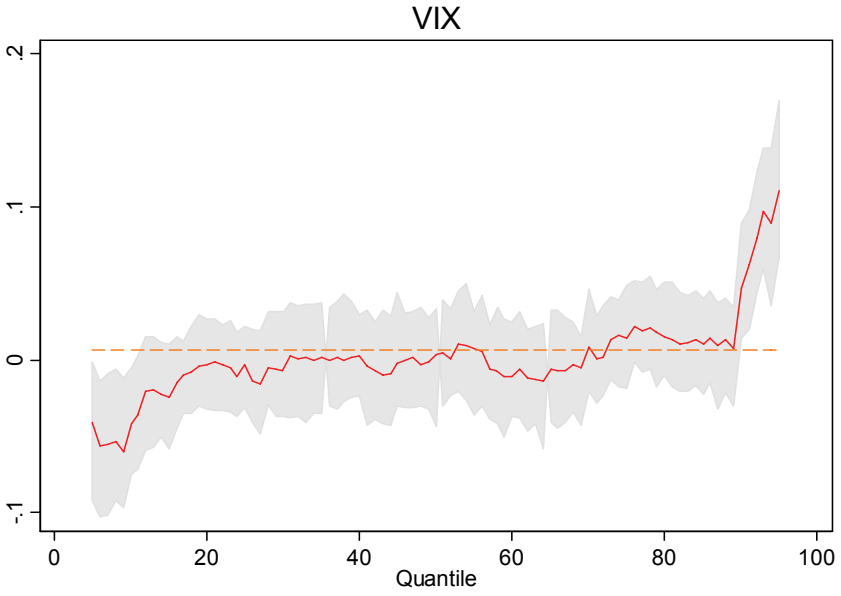
Balance Sheet Management of Investment Banks

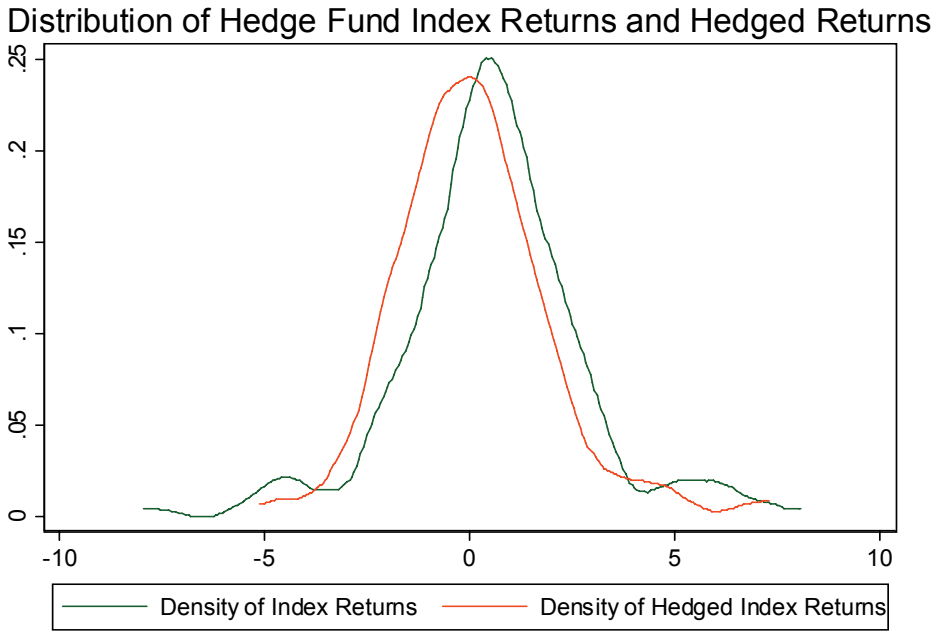
- Adrian and Shin (2007) study the balance sheets of investment banks
- Investment banks target leverage using collateralized financing transactions (e.g. Repos)
- Story: when asset prices go down, investment banks unwind in order to restore their equity cushion
  - This can lead to further downward pressure on prices in general equilibrium



Hedge Fund Tail Risk

- Adrian and Brunnermeier (2007) study the systematic tail risk of hedge funds
- Quantile regressions show that factor exposures of hedge funds differ significantly in the tail
- This suggests a "tail risk offloading strategy" – cost is a reduction in average returns
- However, capital flows into hedge funds react to total return, not tail risk





Tail risk and financial innovation

"New" instruments allow trading of tail risk

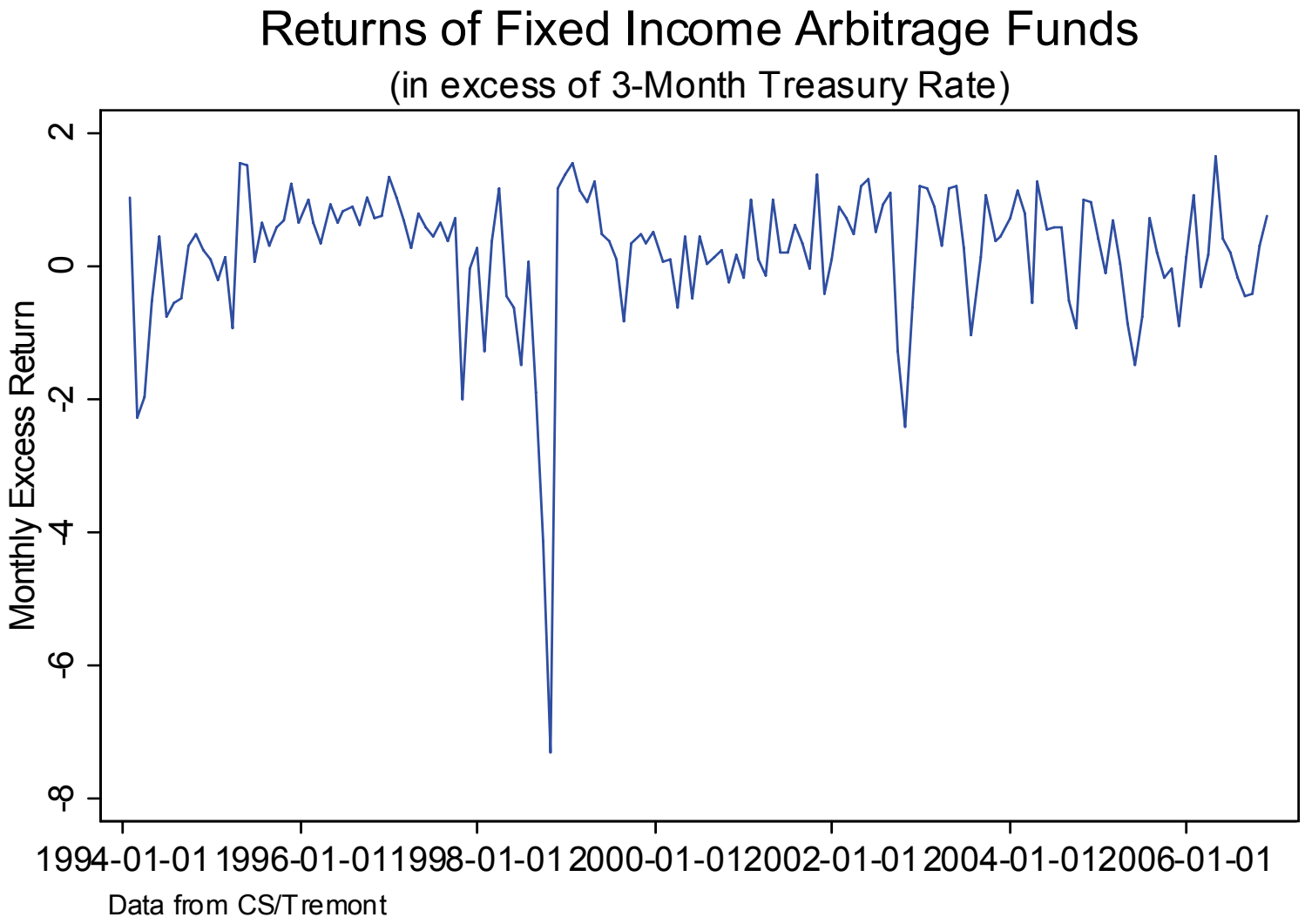
- For example Variance Swaps, Credit Default Swaps, Emerging Markets Total Return Swaps
- Financial innovation makes (tail) risk sharing more efficient

Who holds tail risk determines

- The cross sectional distribution of distress in financial crisis
- Hence the availability of liquidity providers in such events
- … and the potential impact on *capital allocation* and hence *real economic activity*

Key questions:

1) What institutions should hold tail risk?
2) Do holders of tail risk manage risk "adequately"?


Returns of Fixed Income Arbitrage Funds
(in excess of 3-Month Treasury Rate)
Monthly Excess Return
2
0
-2
-4
-6
-8
1994-01-01
1996-01-01
1998-01-01
2000-01-01
2002-01-01
2004-01-01
2006-01-01
Data from CS/Tremont