Financial Intermediation and the Post-Crisis Financial System

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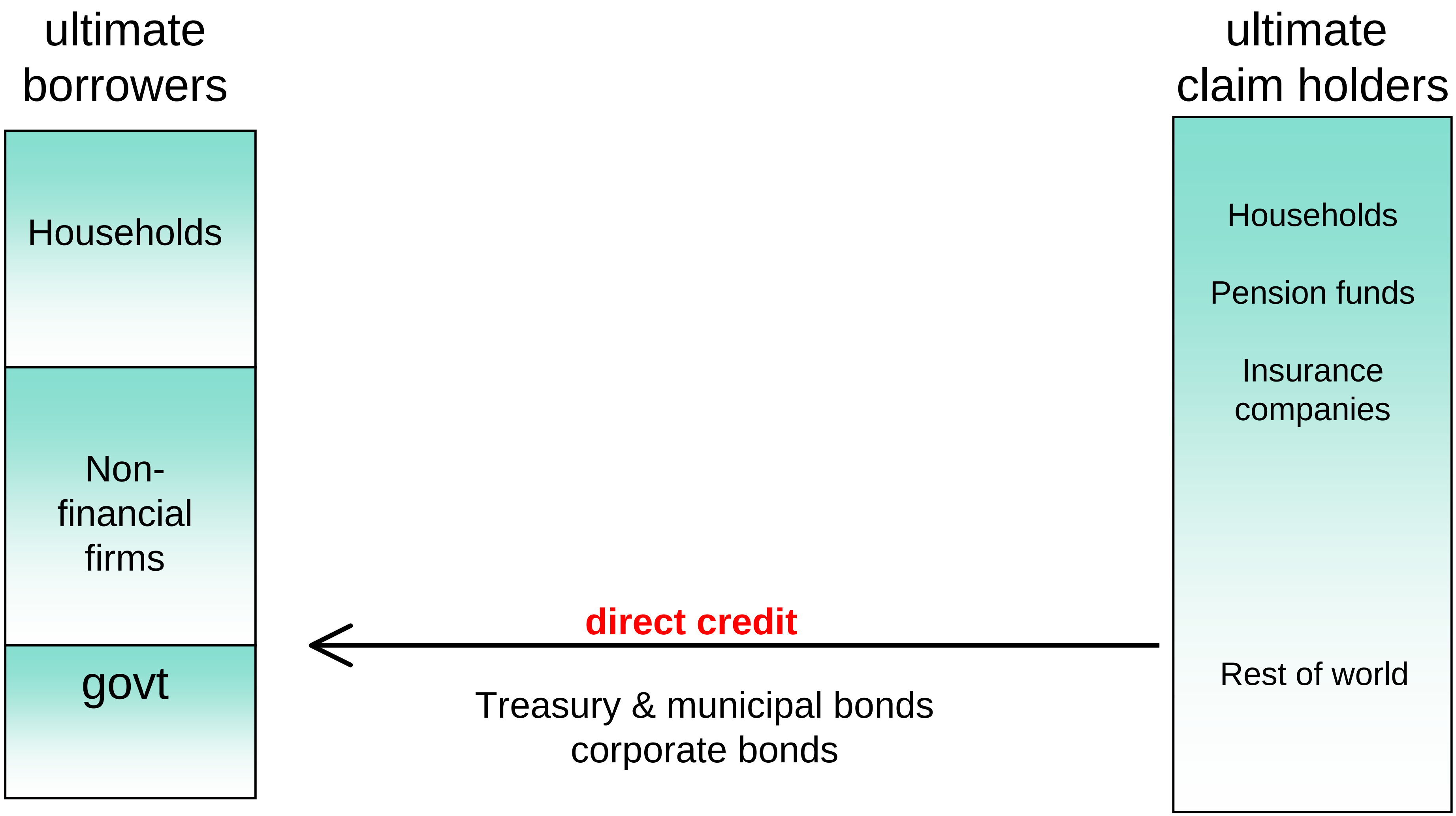
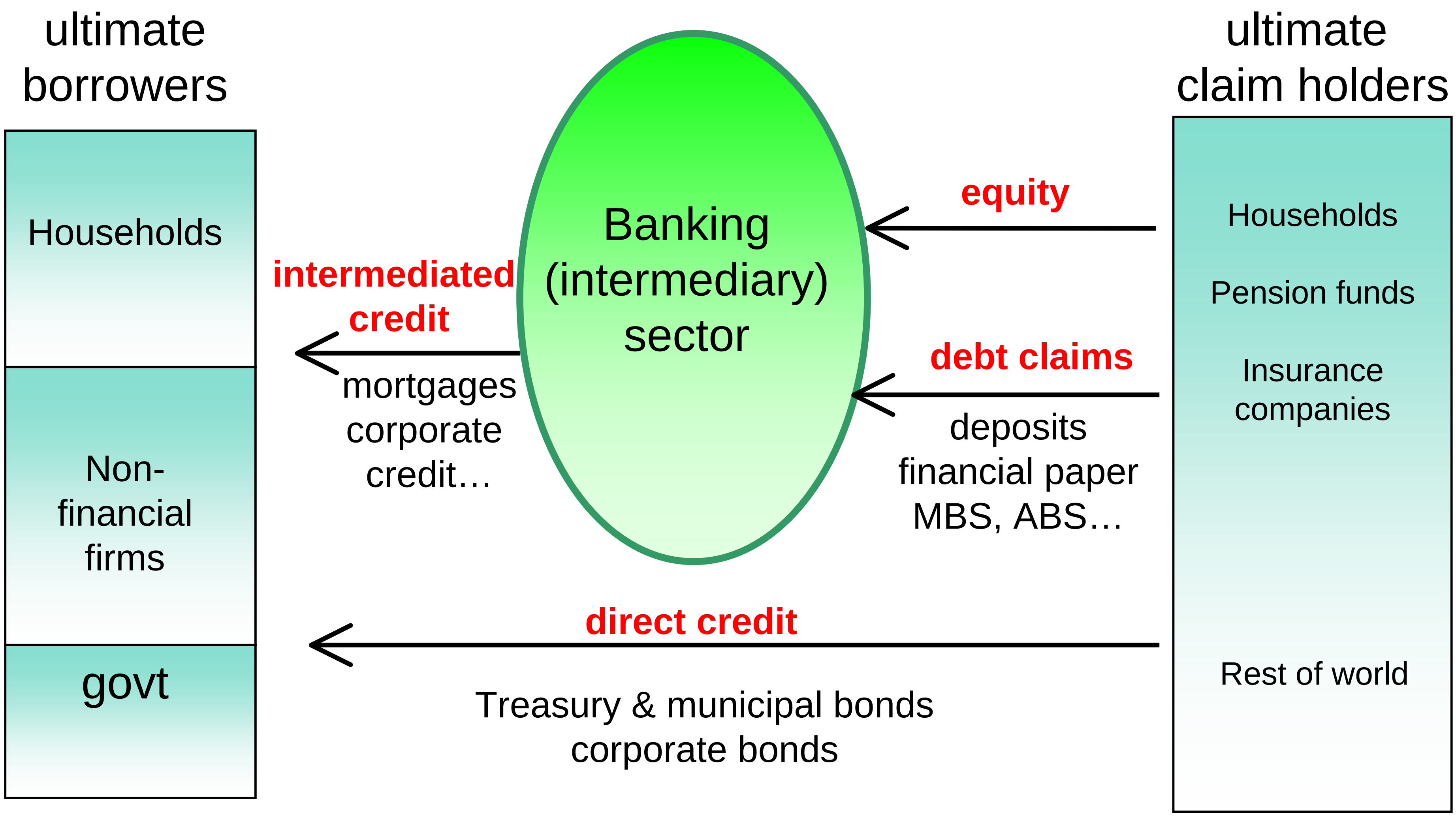
Outline

- Lessons on financial system architecture from global financial crisis
- Implications for
  - Size of financial sector relative to real economy
  - Securitization
  - Financial regulation
  - Accounting standards
  - Monetary policy

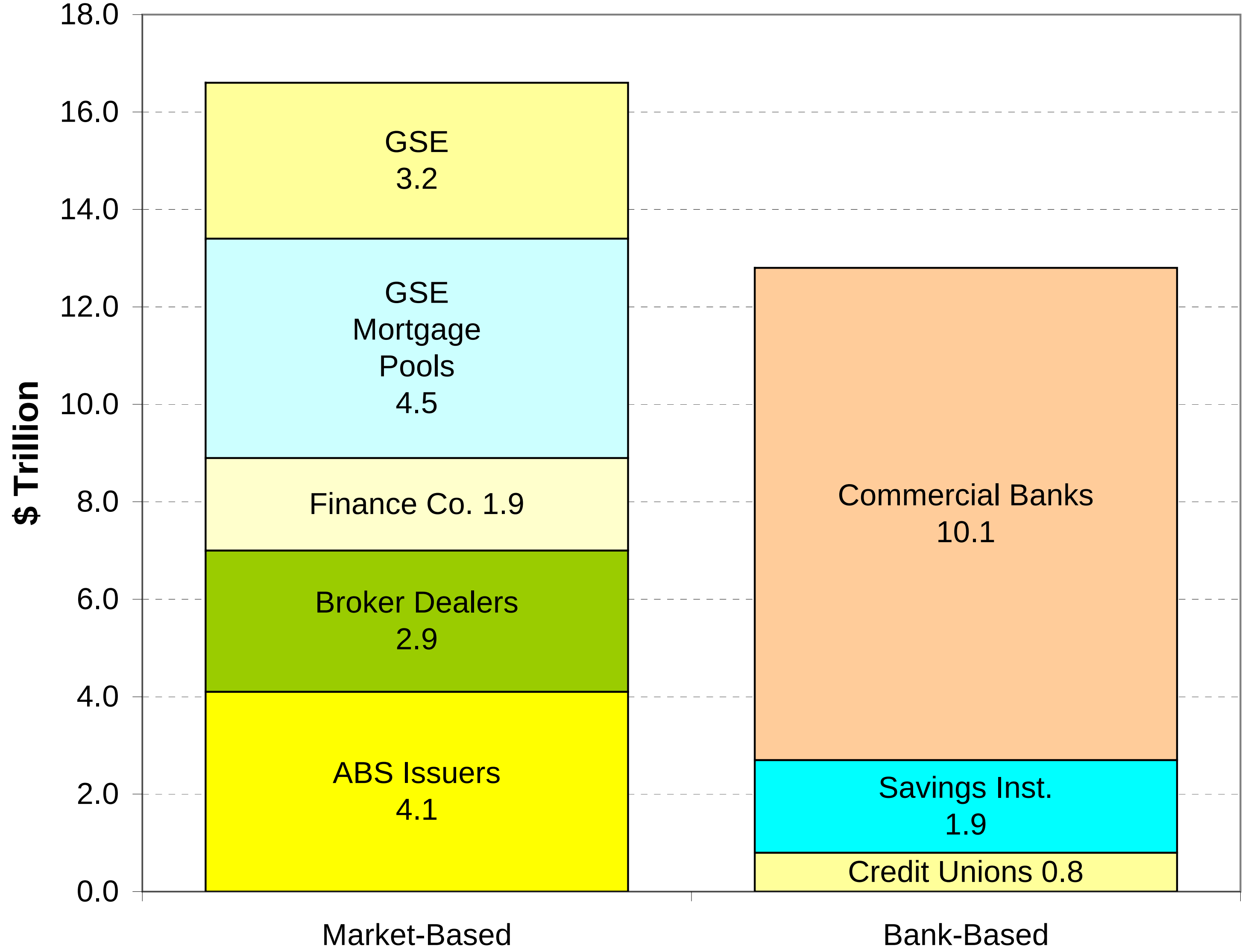
Stylized Financial System



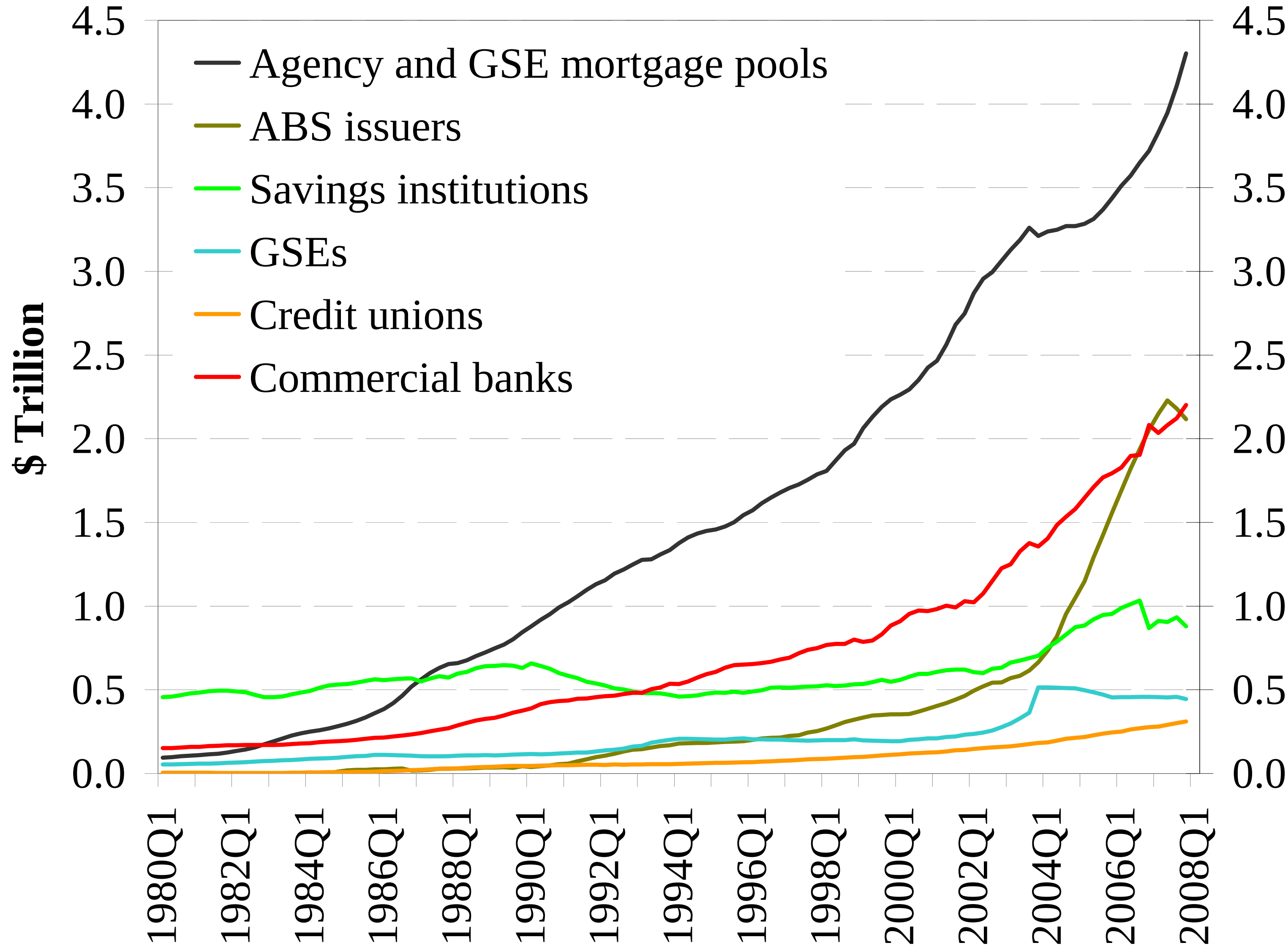
Stylized Financial System



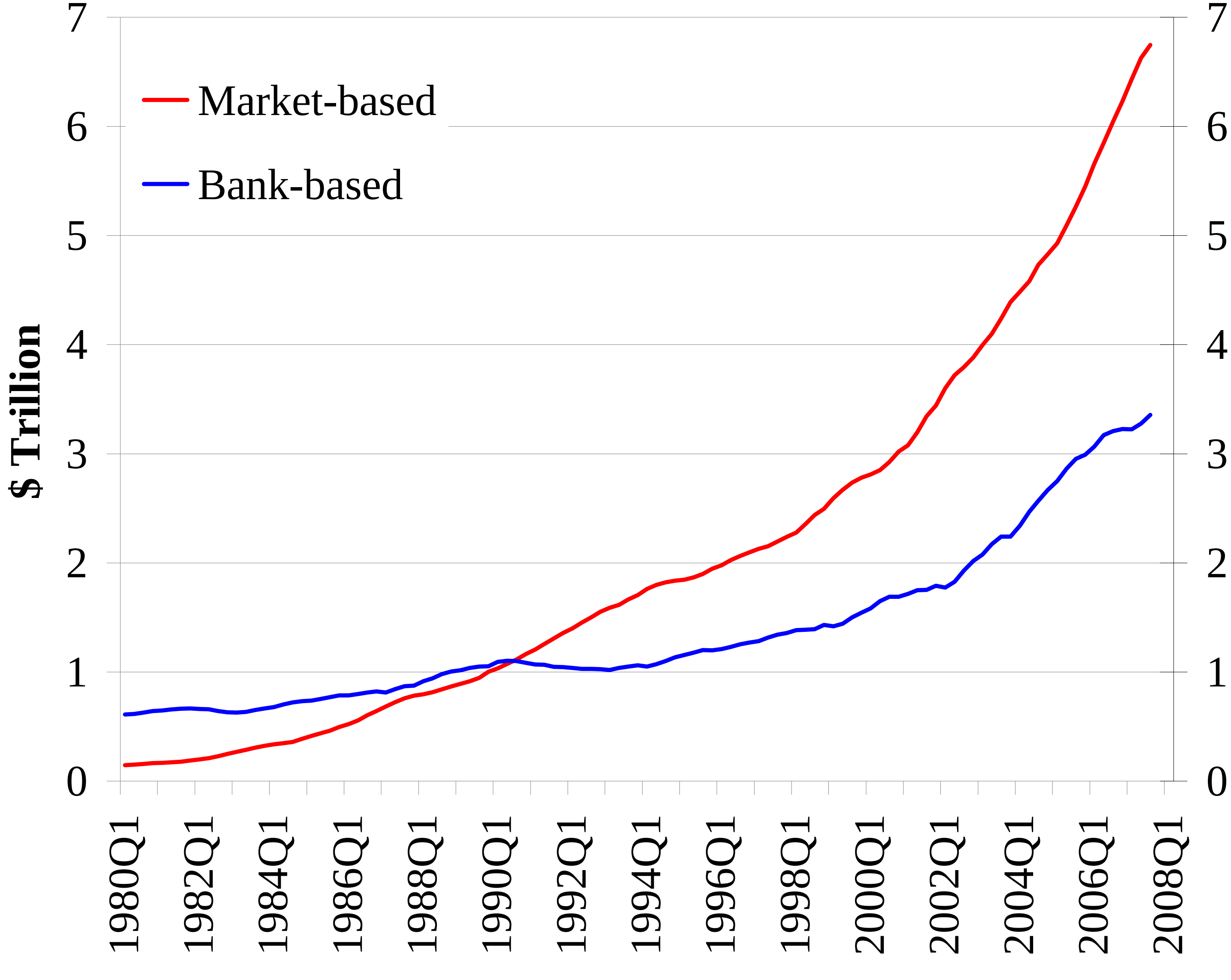
US Financial Intermediaries Total Assets (2007Q2)



Holding of US Home Mortgages by Type of Financial Institution

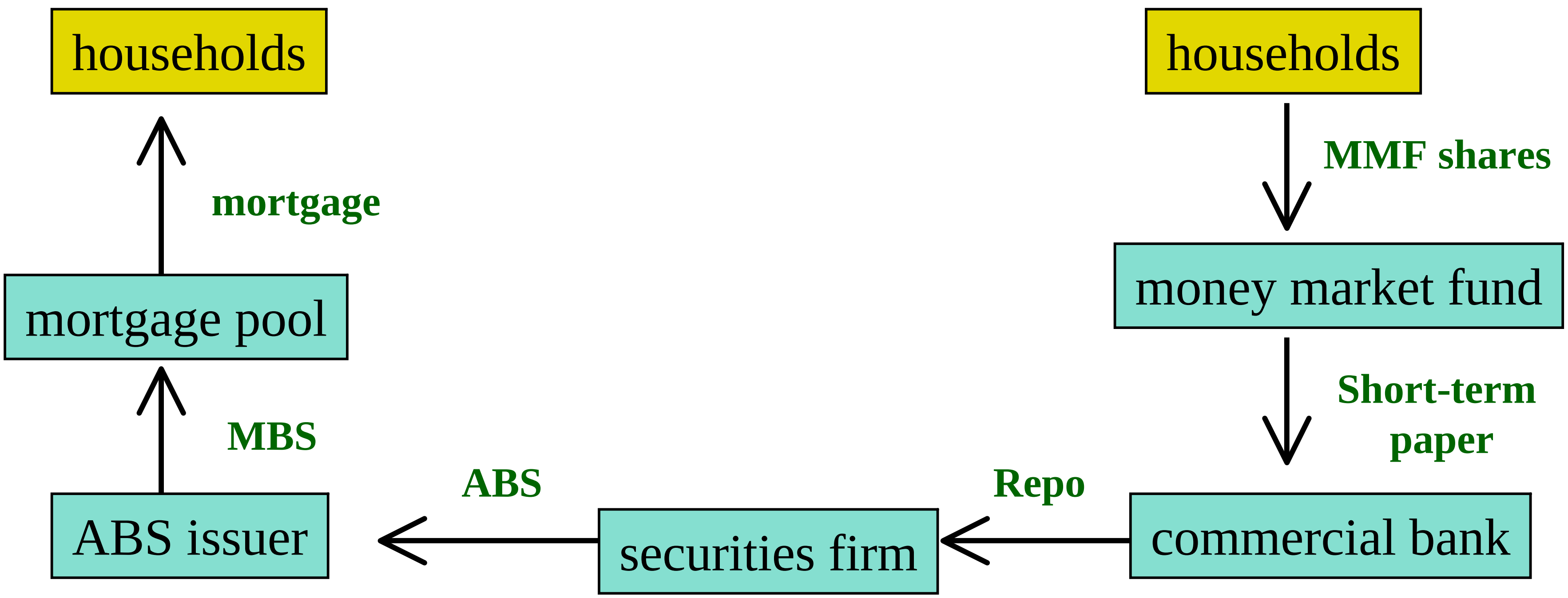


Market-Based and Bank-Based Holding of Home Mortgages



Short Intermediation Chain

Long Intermediation Chain



What Are the Advantages of the Long Intermediation Chain?

- "Securitization enables dispersion of credit risk"
- "Long chains promote more efficient maturity transformation"
  - "Households want short, liquid claims"
  - "Shadow banking system gives them what they want"

But Evidence in this Crisis Points the Other Way

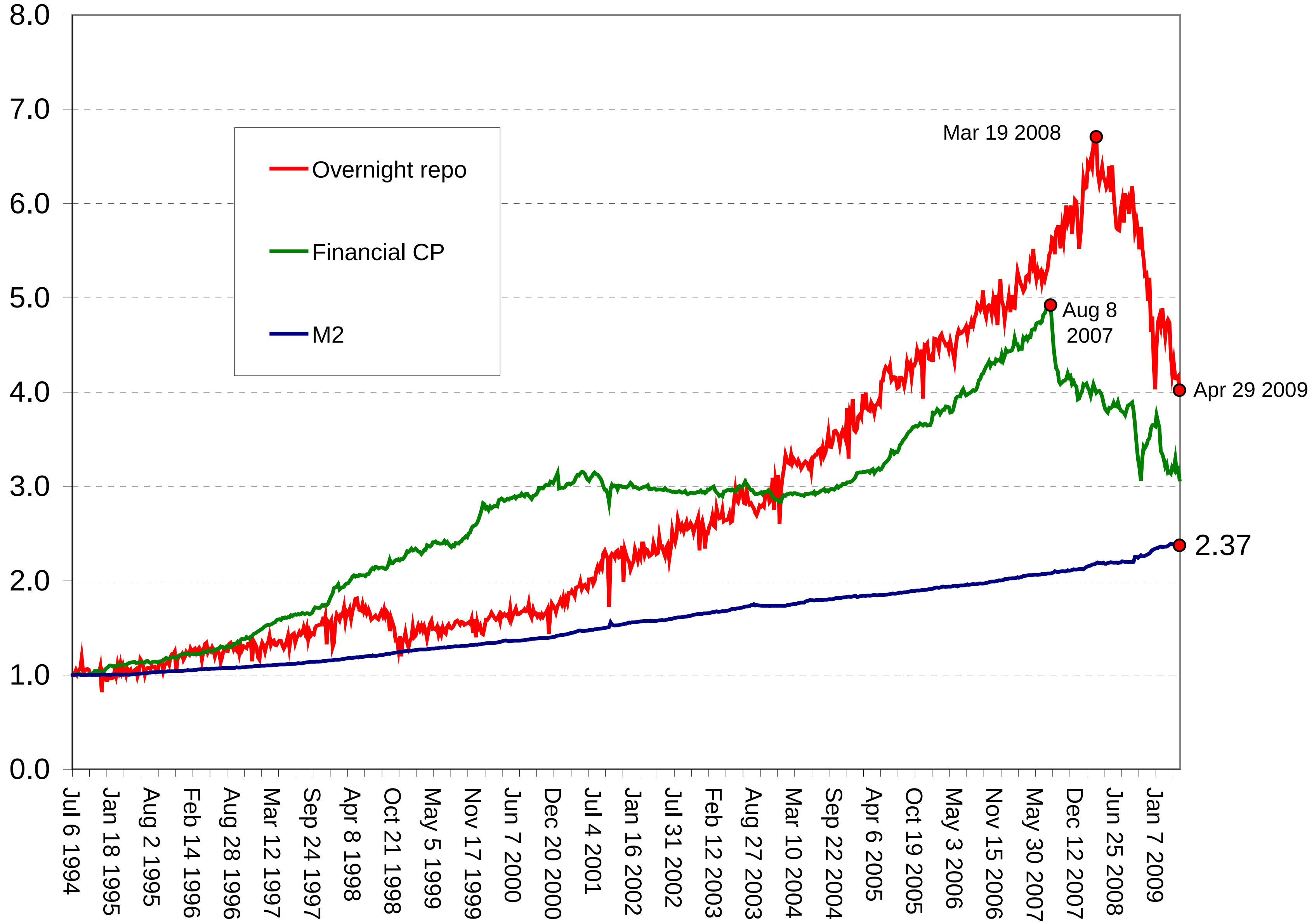
- Securitization has *concentrated risks* in leveraged sector
- Biggest growth in short-term debt was *between* financial intermediaries
- Financial intermediaries have become more *intertwined*
  - "CoVaR" Adrian and Brunnermeier (2009)

Exposure to Subprime

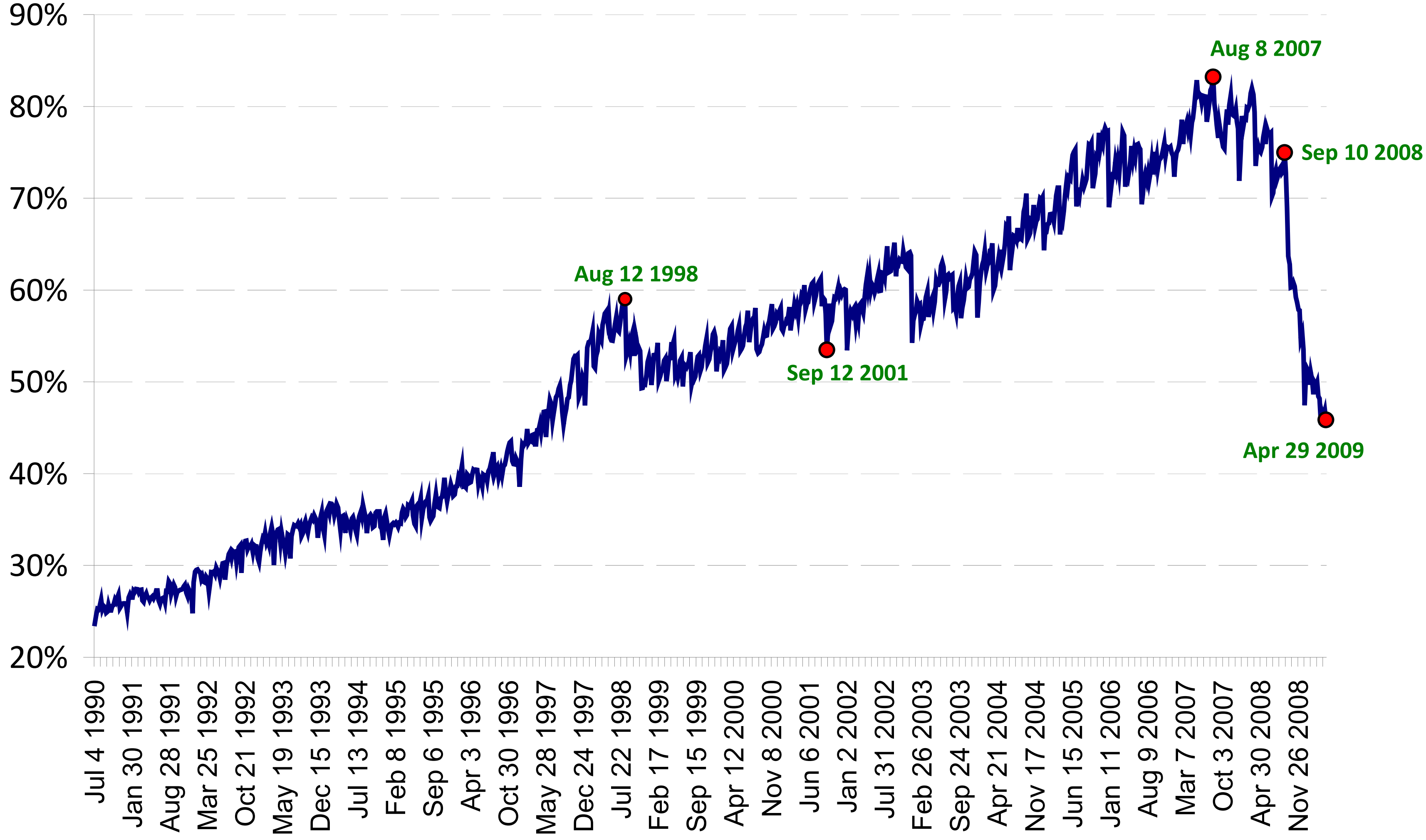
	Total reported sub-prime exposure (US$bn)	Percent of reported exposure
Investment Banks	75	5%
Commercial Banks	418	31%
GSEs	112	8%
Hedge Funds	291	21%
Insurance Companies	319	23%
Finance Companies	95	7%
Mutual and Pension Funds	57	4%
Leveraged Sector	896	66%
Unleveraged Sector	472	34%
Total	1,368	100%

Source: Greenlaw, Hatzius, Kashyap and Shin (2008)

Overnight repos, Financial CP and M2
(weekly, July 6 1994 as base date)



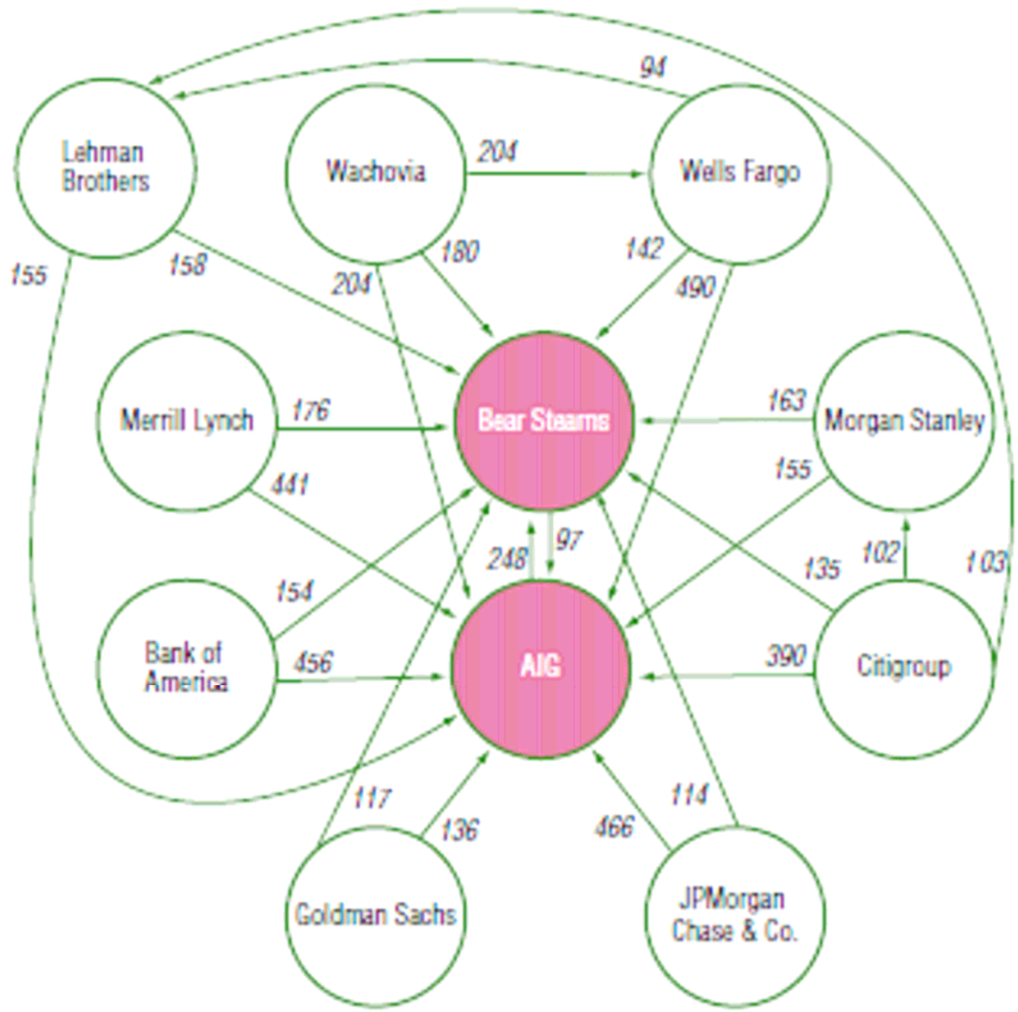
Repos and Financial CP as Fraction of M2 (weekly)



Source: Adrian and Shin (2009)

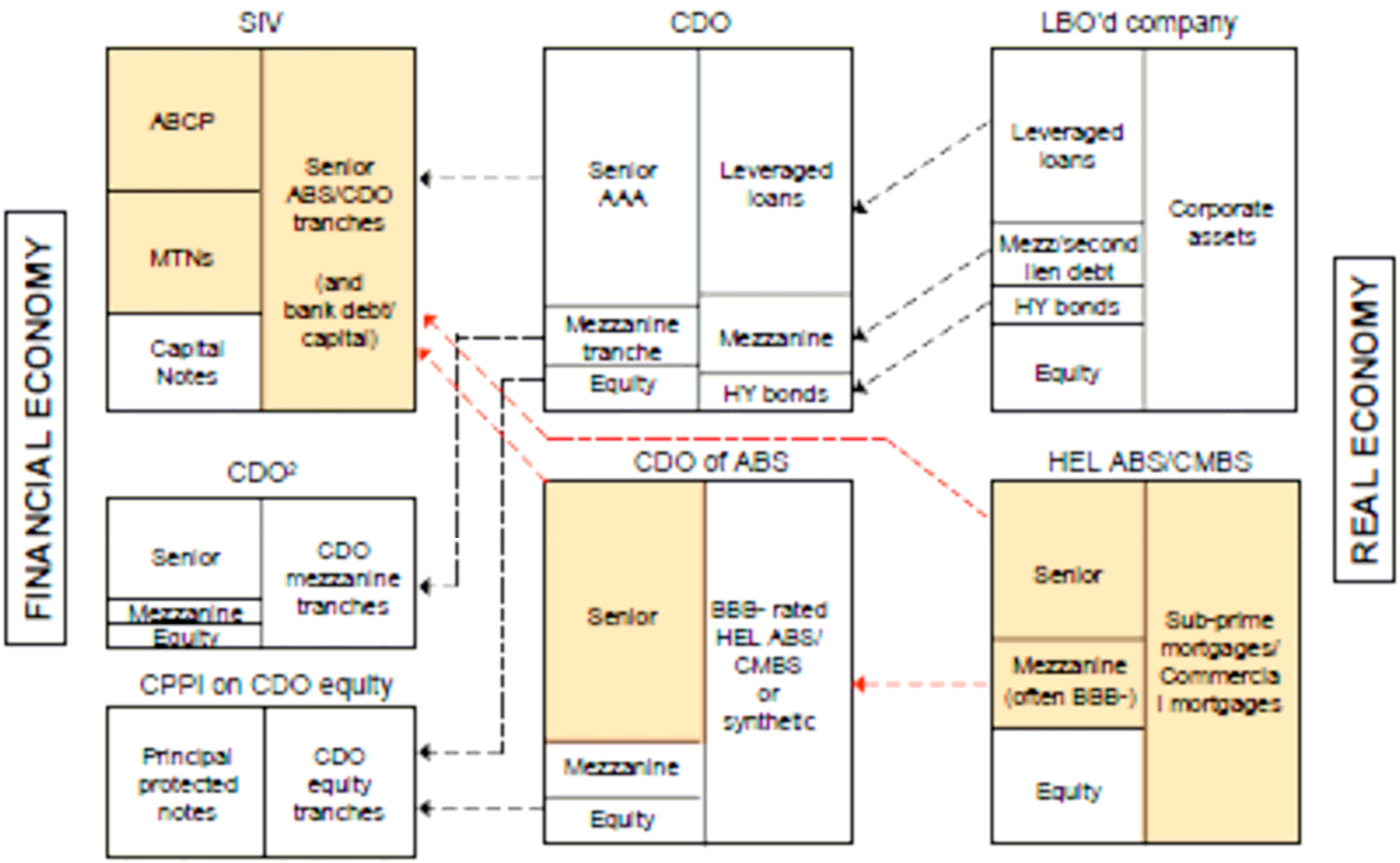
US Institutions' CoVaR

IMF Co-Risk Measures (March 2008)



Source: IMF GFSR (April 2009)

Multi-layered Financial System



Source: Haldane (2009)

Global Interconnectedness

Chart 2: Global Financial Network: 1995

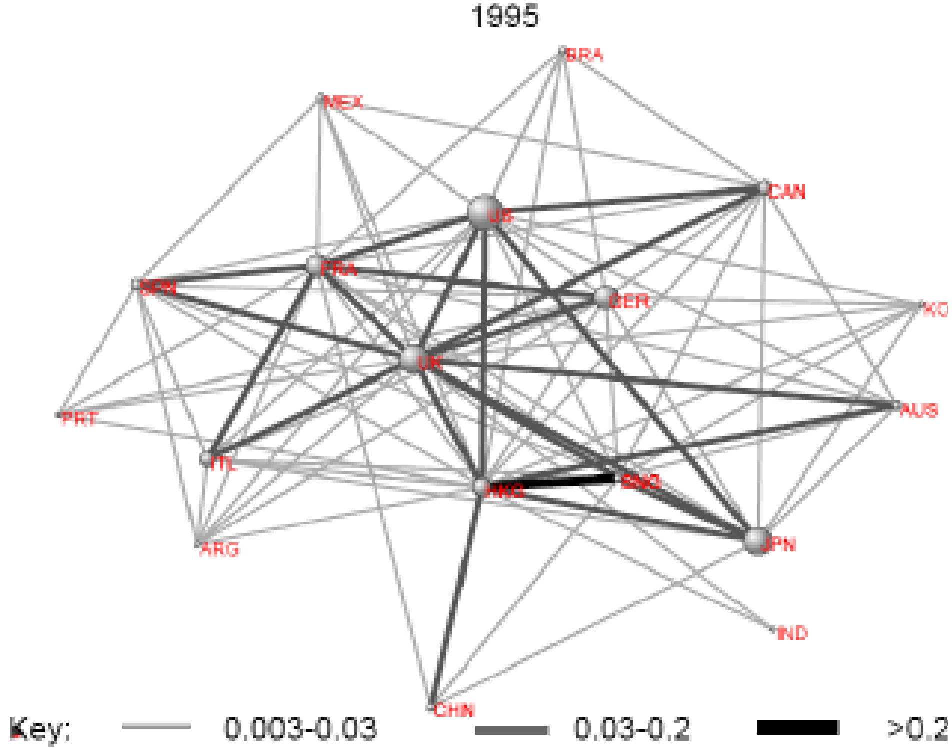
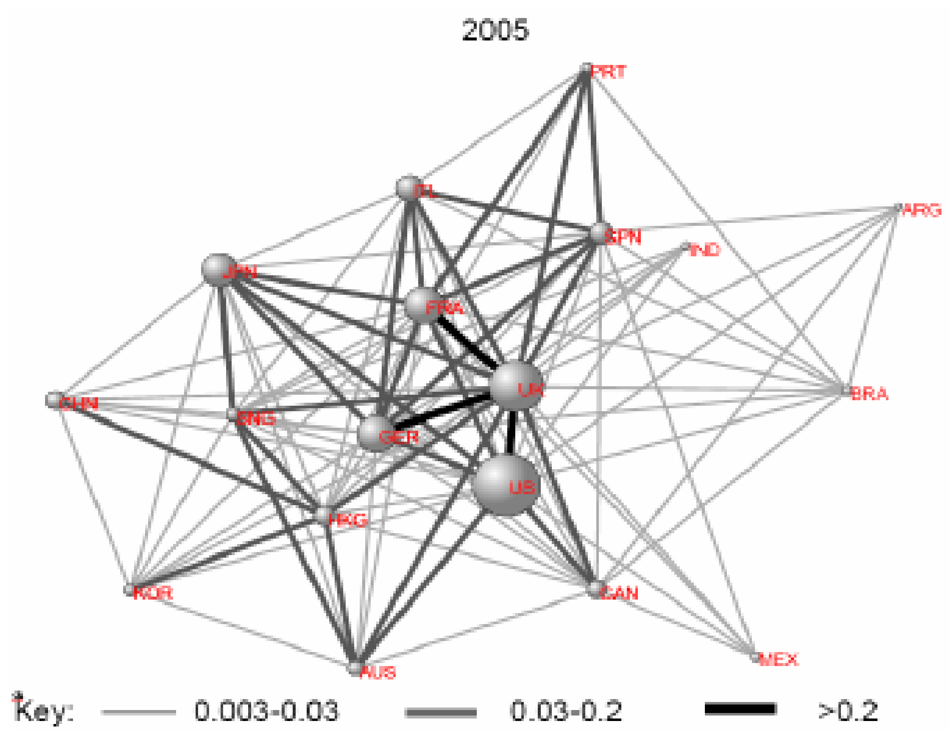


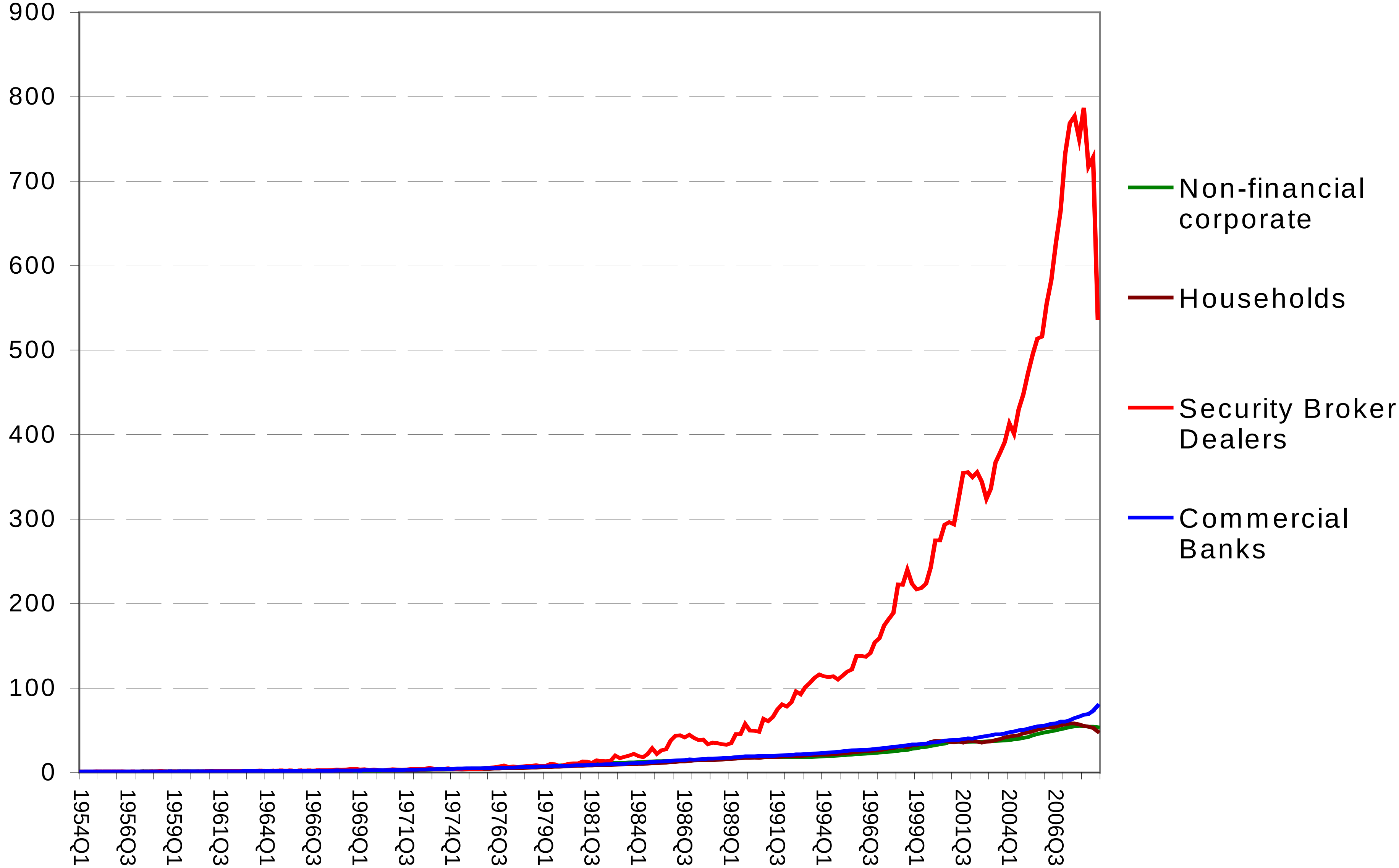
Chart 3: Global Financial Network: 2005



Source: Haldane (2009)

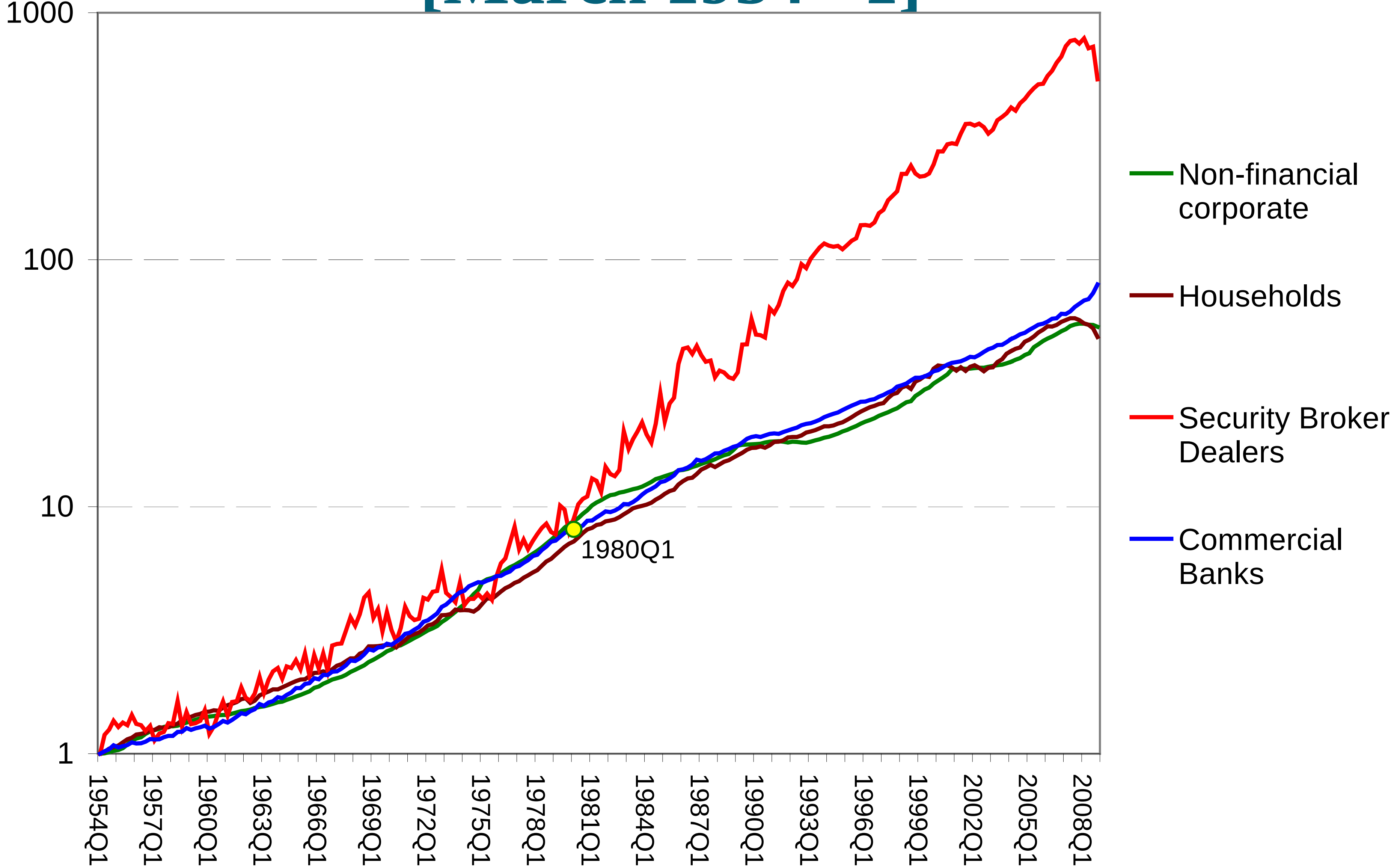
Relative Size of Intermediary Sector

Total Assets of Four Sectors [March 1954 =1]



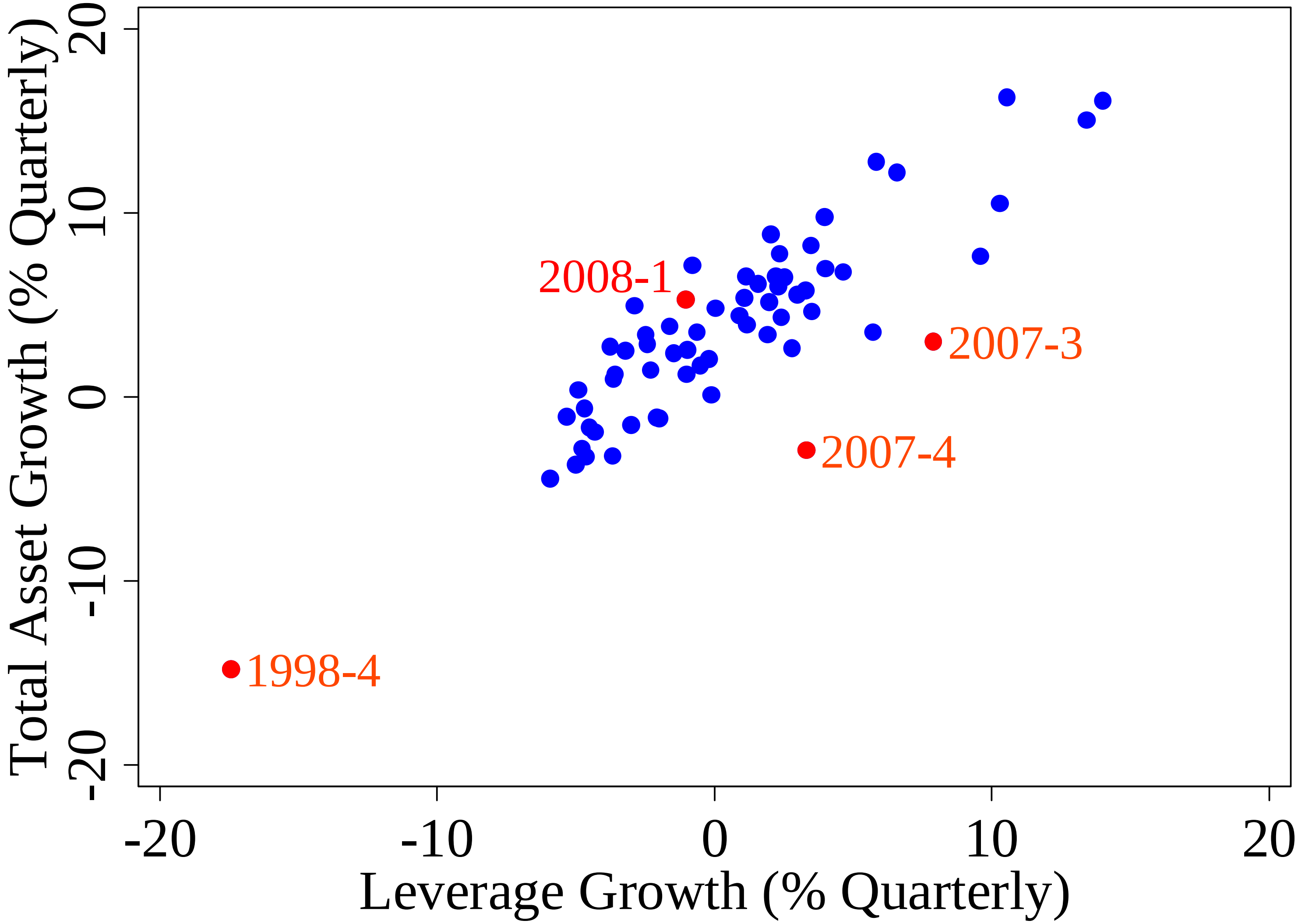
(Source: Federal Reserve, Flow of Funds)

Total Assets (Log Scale) [March 1954 =1]



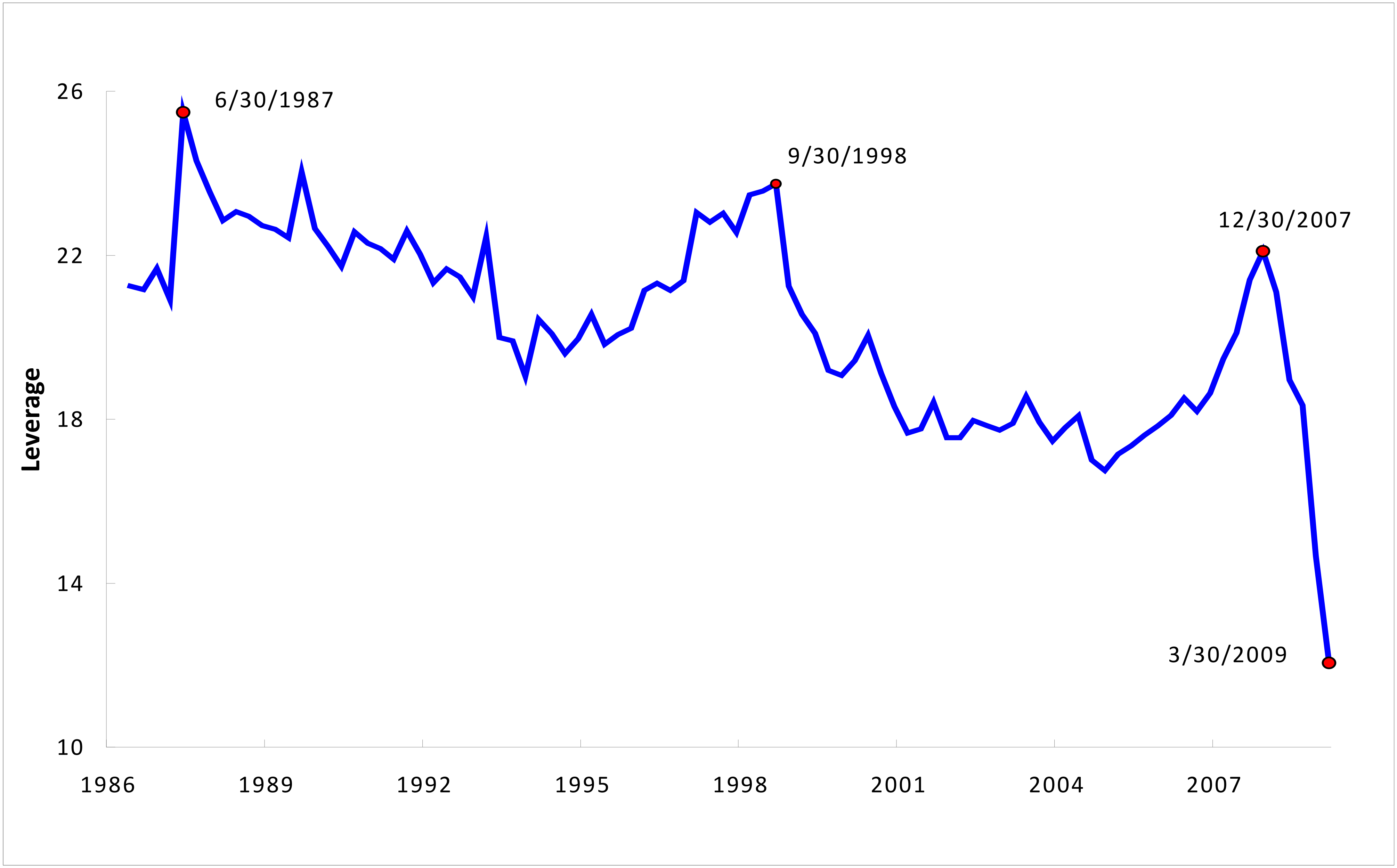
(Source: Federal Reserve, Flow of Funds)

Procyclical Leverage of Five US Investment Banks

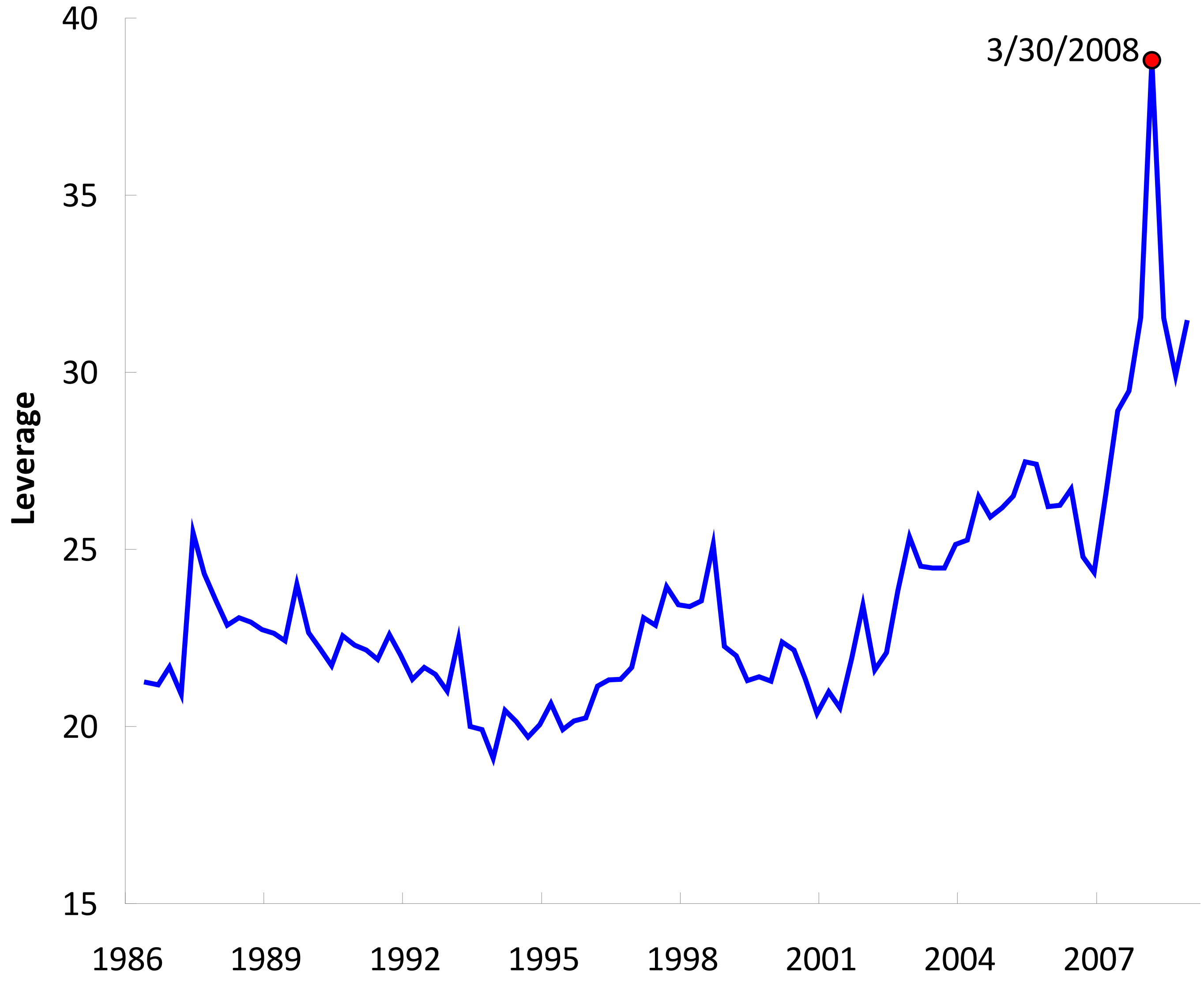


Source: Adrian and Shin (2007)

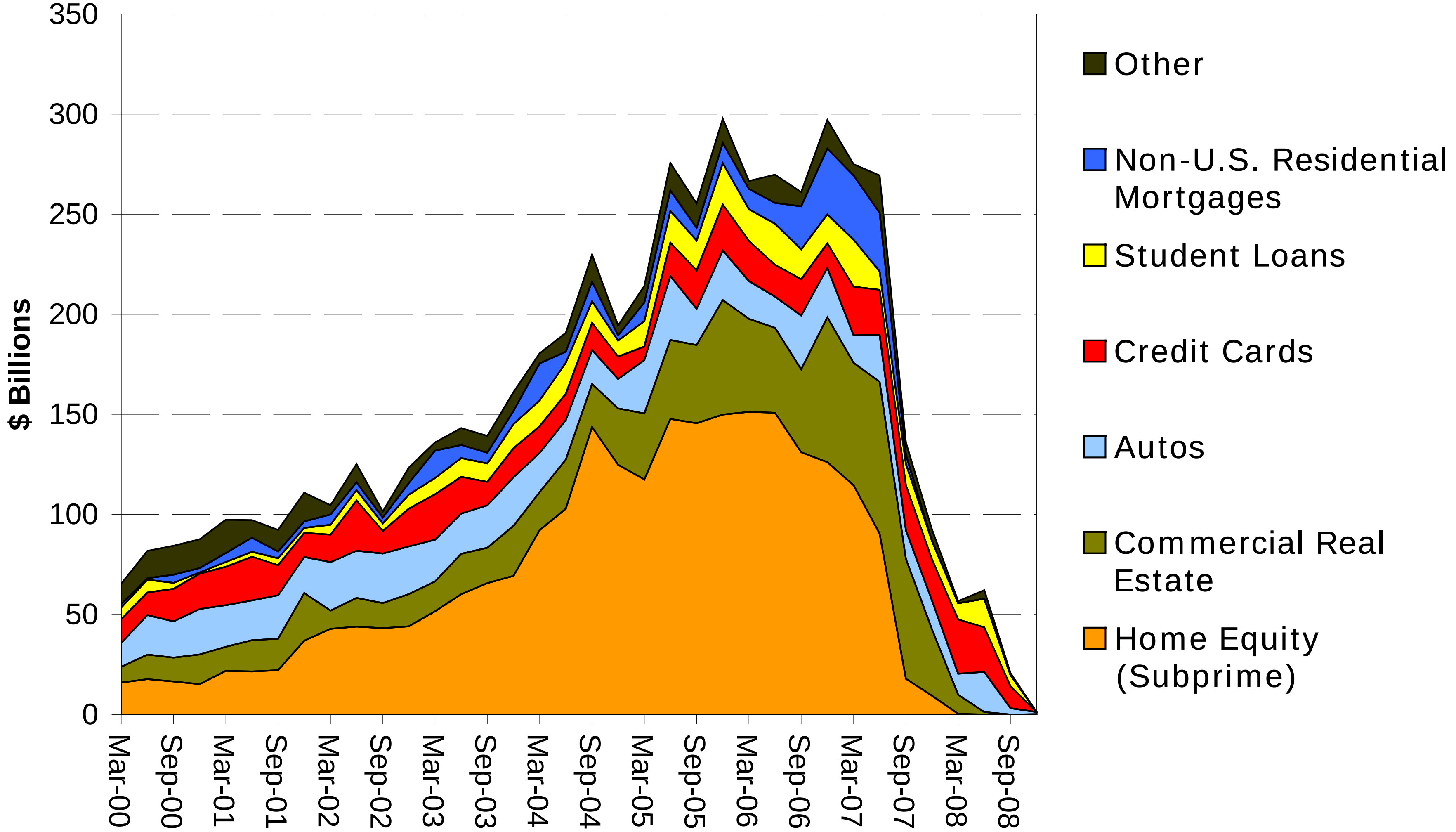
US Primary Dealer Mean Leverage



All Primary Dealer Mean Leverage

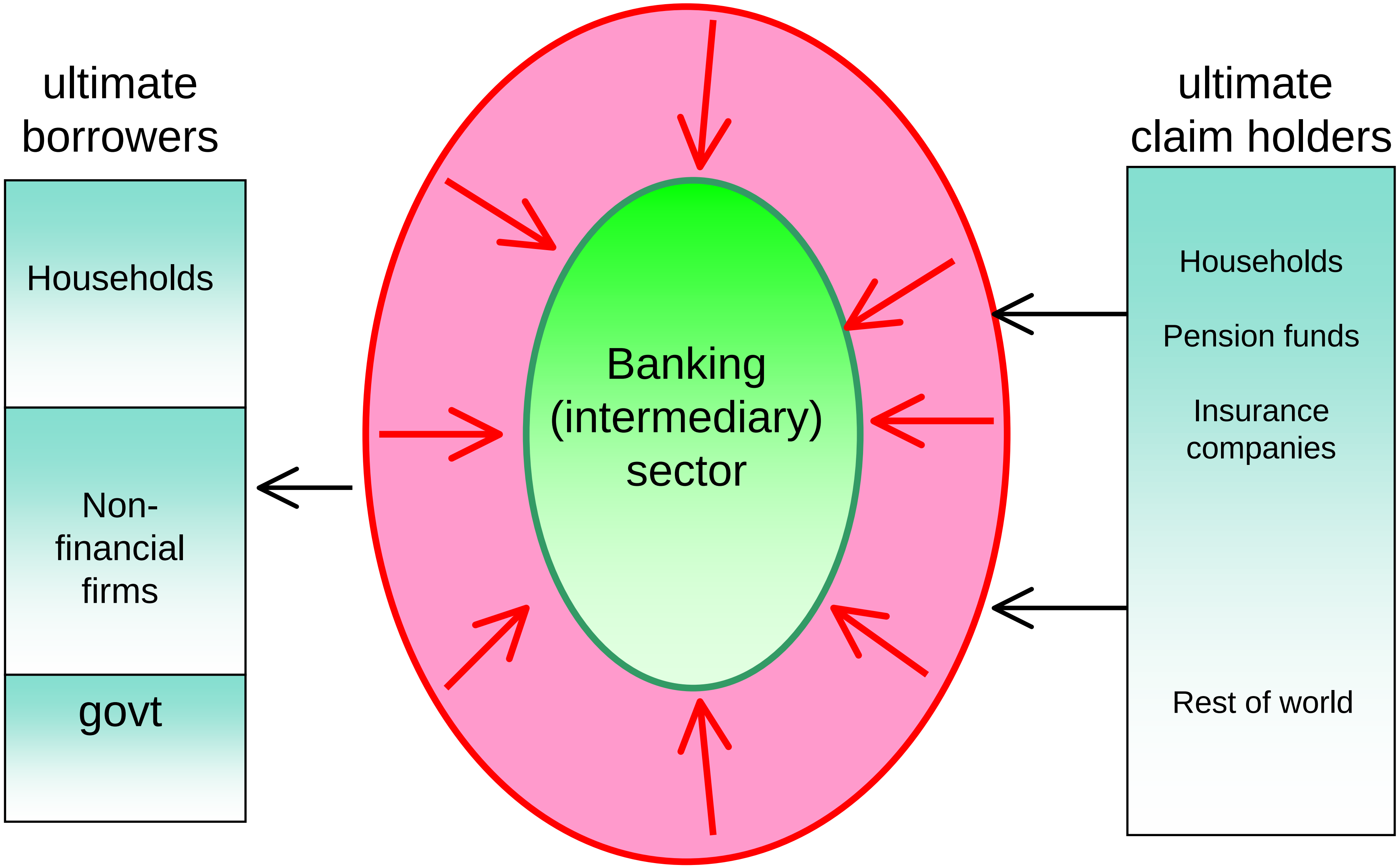


New Issuance of Asset Backed Securities in Previous Three Months

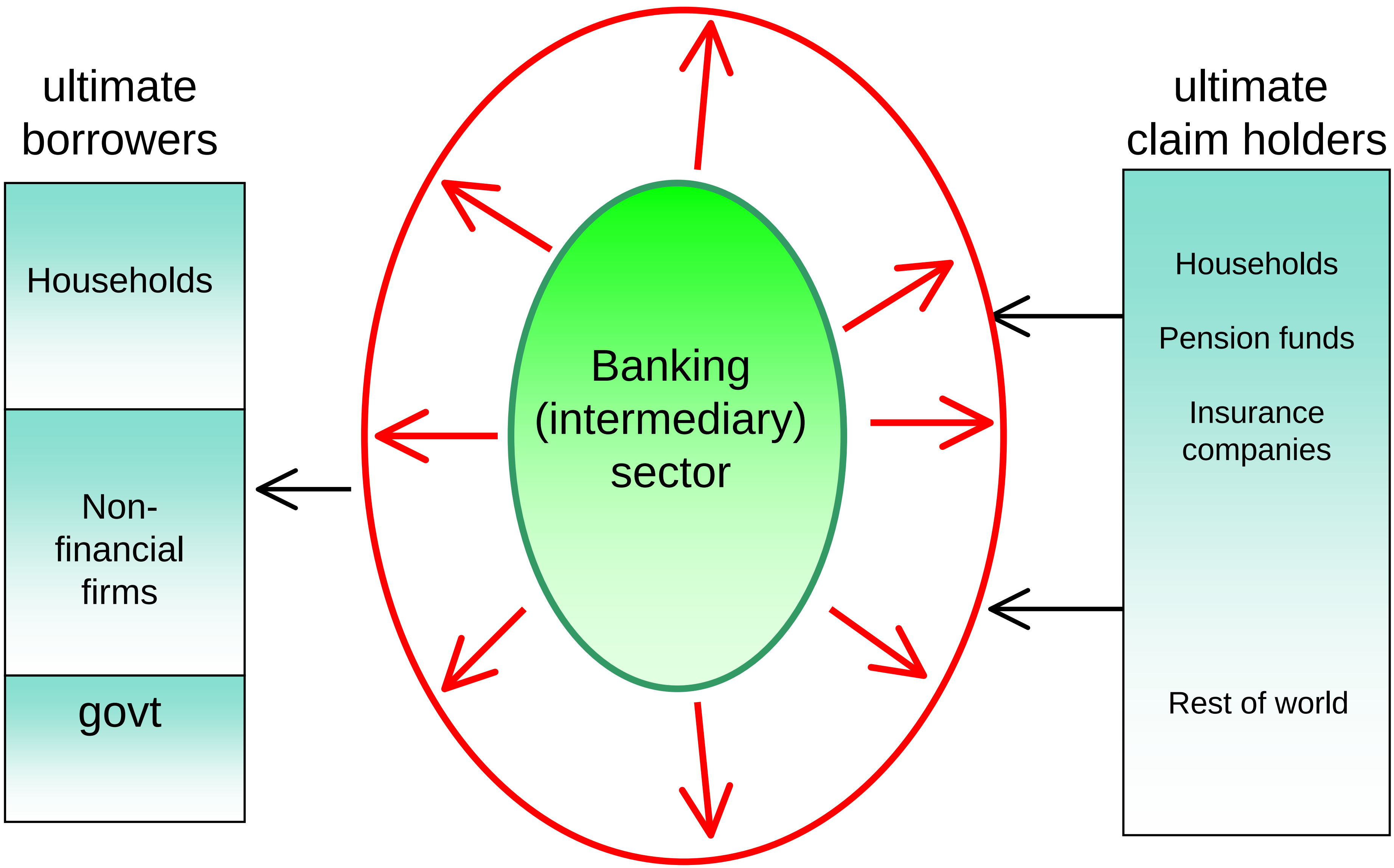


Source: JP Morgan

Biggest Damage is Done in Contractions



But Seeds of Crises Are Sown in Expansions



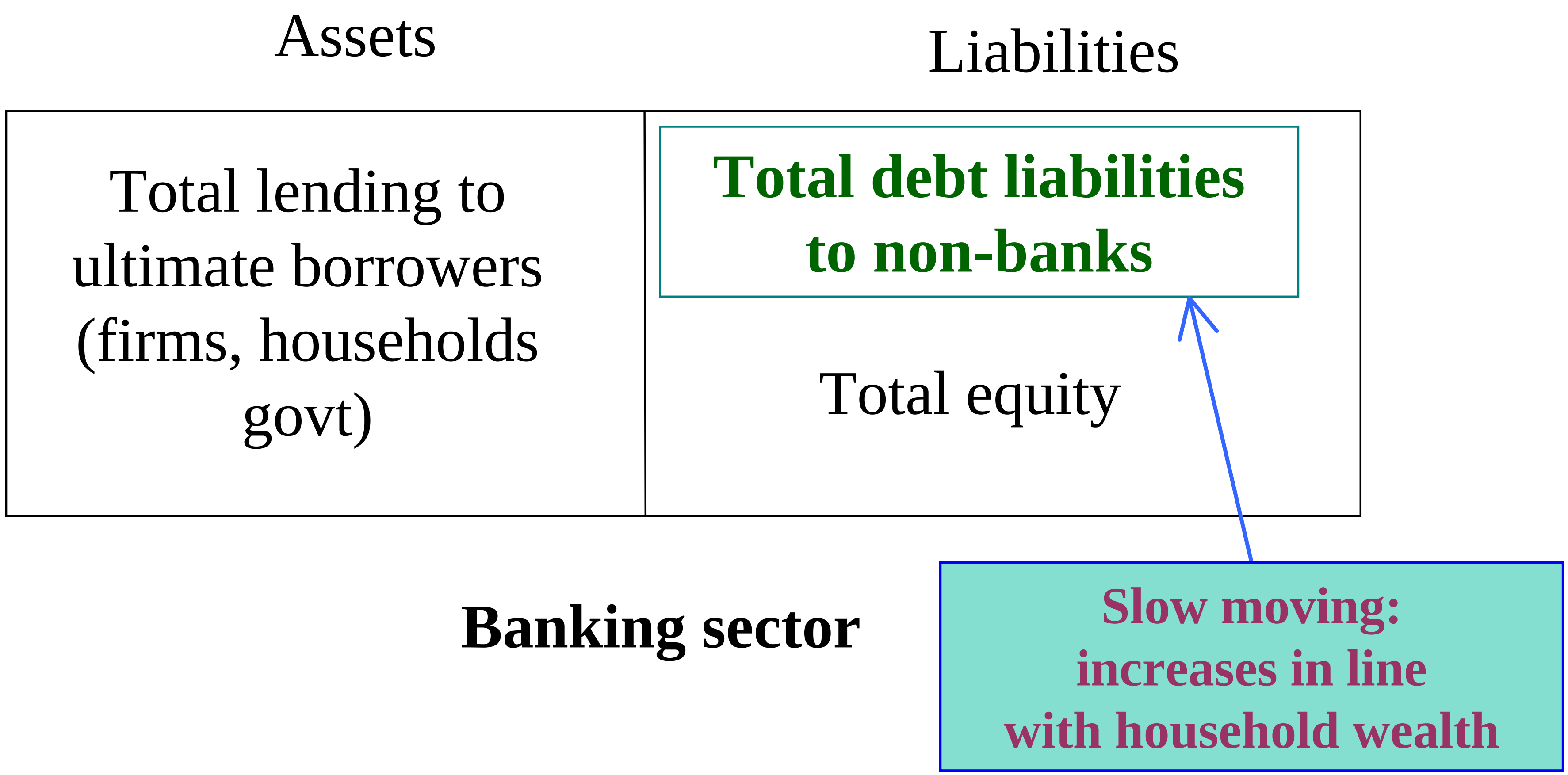
How To Moderate Balance Sheet Boom/Bust Cycles?

Individual Bank Balance Sheet

Assets	Liabilities
Loans to firms, households	Liabilities to non-banks (e.g. deposits)
Claims on other banks	Liabilities to other banks
	Equity

Individual bank

Balance Sheet for Banking Sector



Aggregate Balance Sheet Identity

$$\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i$$

Total lending to ultimate borrowers

Total debt liabilities To non-banks

Total equity of intermediaries

Booms

- Higher leverage of financial intermediaries

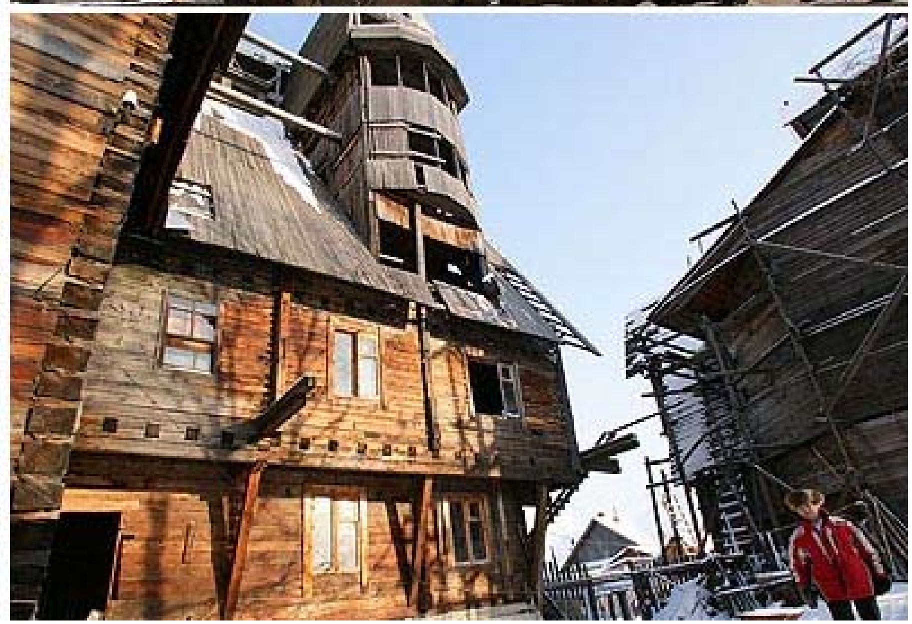
- Larger balance sheets of intermediaries

- Greater intertwining of intermediaries
  - Longer chains
  - Maturity mismatch to sustain longer chains

Architectural Analogy

- Adding extra capacity (more rooms) to a house when constrained by limited footprint
  - The only way is to build up (like a Manhattan skyscraper)
  - Except that Manhattan skyscraper is planned ahead, as a coherent whole
  - Better analogy is adding extra floors to a building without anticipating future floors on top

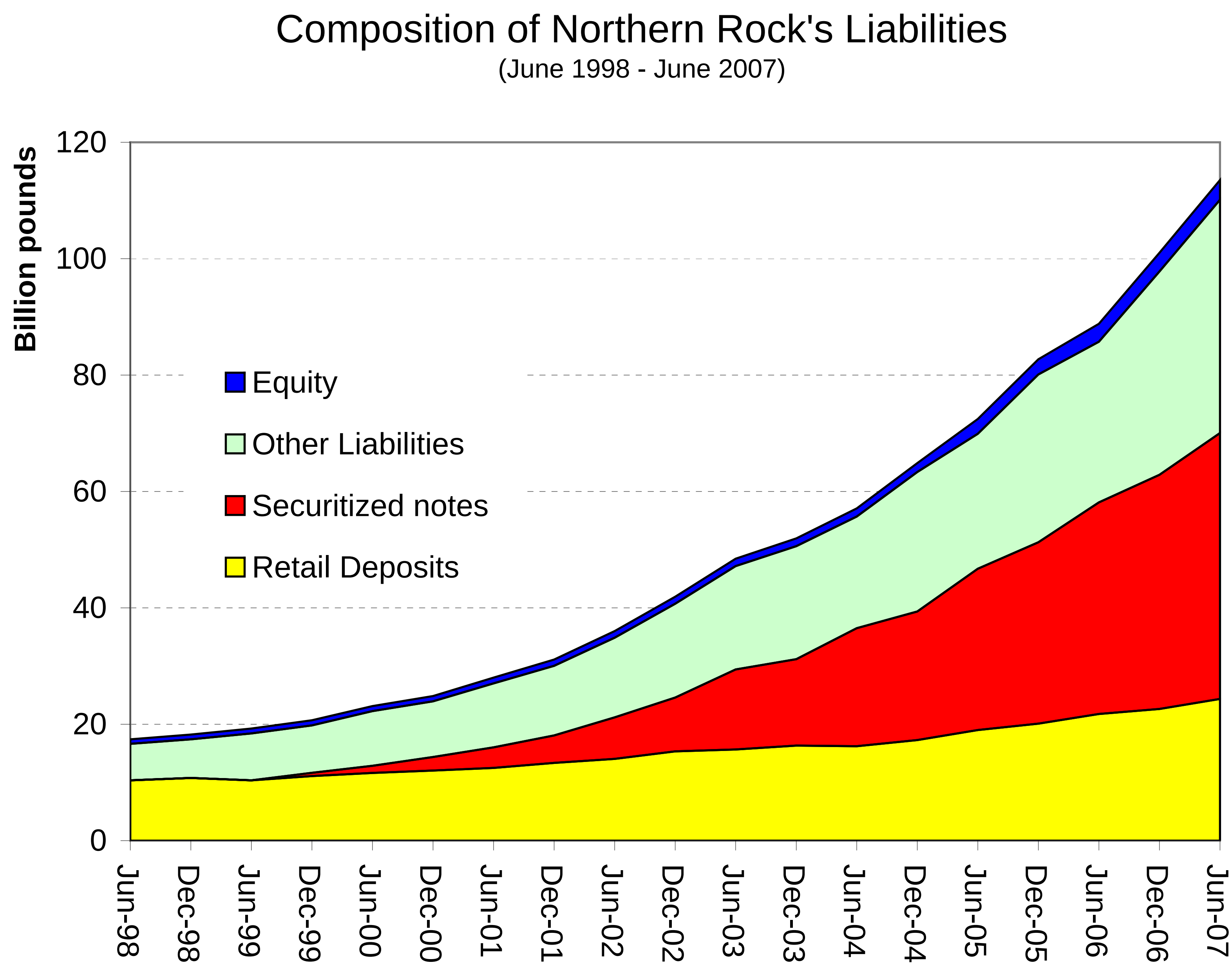
Sutyagin House in Archangel

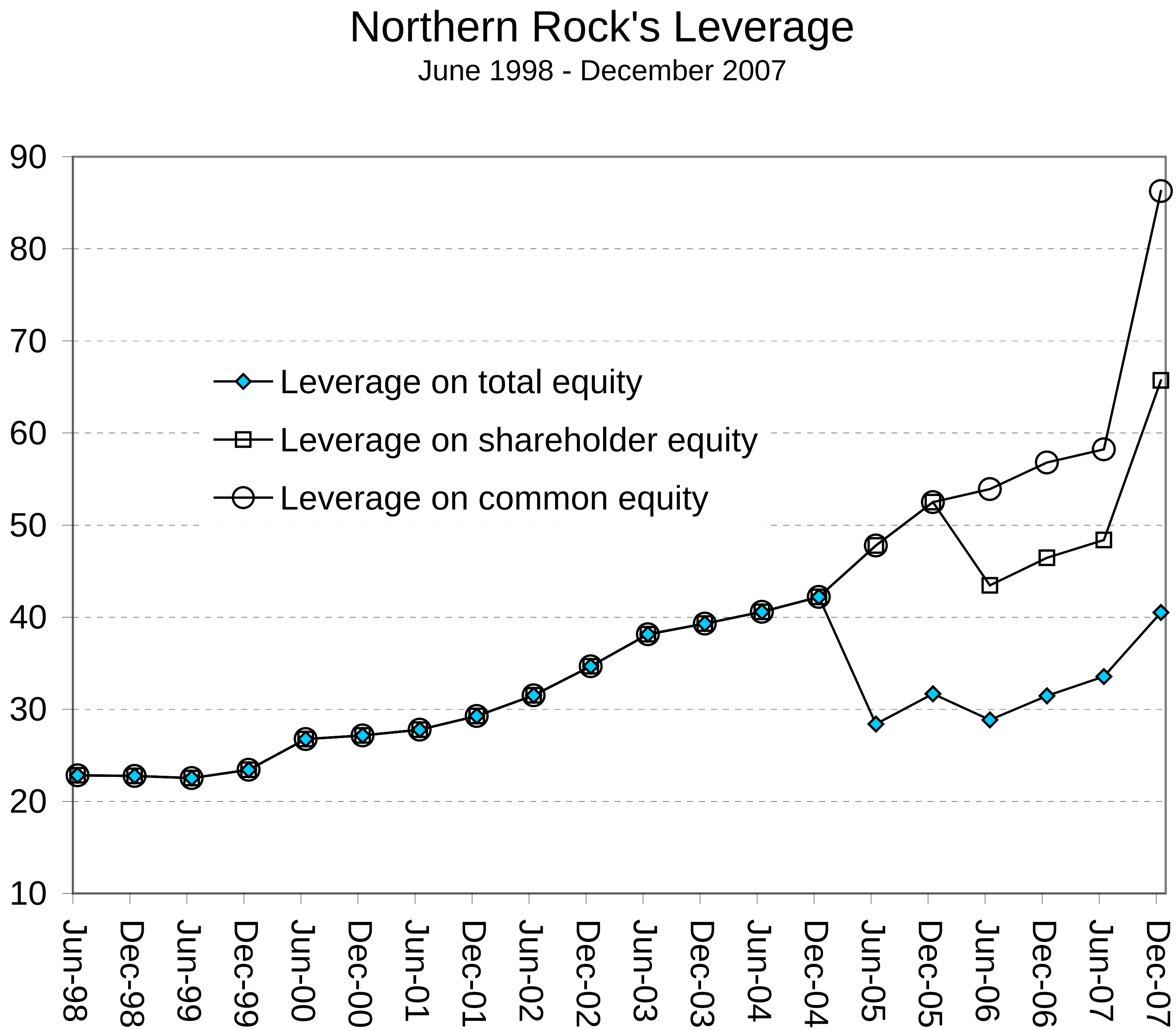


Busts

- Deleveraging
- Shrinking balance sheets
- Unraveling of interbank lending
  - Runs
  - Retrenchment

Northern Rock


Composition of Northern Rock's Liabilities
(June 1998 - June 2007)
Billion pounds
0
20
40
60
80
100
120
Equity
Other Liabilities
Securitized notes
Retail Deposits
Jun-98
Dec-98
Jun-99
Dec-99
Jun-00
Dec-00
Jun-01
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07


Northern Rock's Leverage
June 1998 - December 2007
90
80
70
60
50
40
30
20
10
Leverage on total equity
Leverage on shareholder equity
Leverage on common equity
Jun-98
Dec-98
Jun-99
Dec-99
Jun-00
Dec-00
Jun-01
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07

What Prescriptions for Better Functioning Intermediary Sector?

Approach 1: Moderate Fluctuations in Leverage through Countercyclical Capital Regulation

$$\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i$$

- Leverage cap (e.g. Switzerland)
- Countercyclical capital targets (Geneva Report)

Approach 2: Moderate Fluctuations in Equity through Forward-looking Provisioning

$$\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i$$

- Spanish Statistical Provisioning
- Pigovian Tax (Geneva Report)

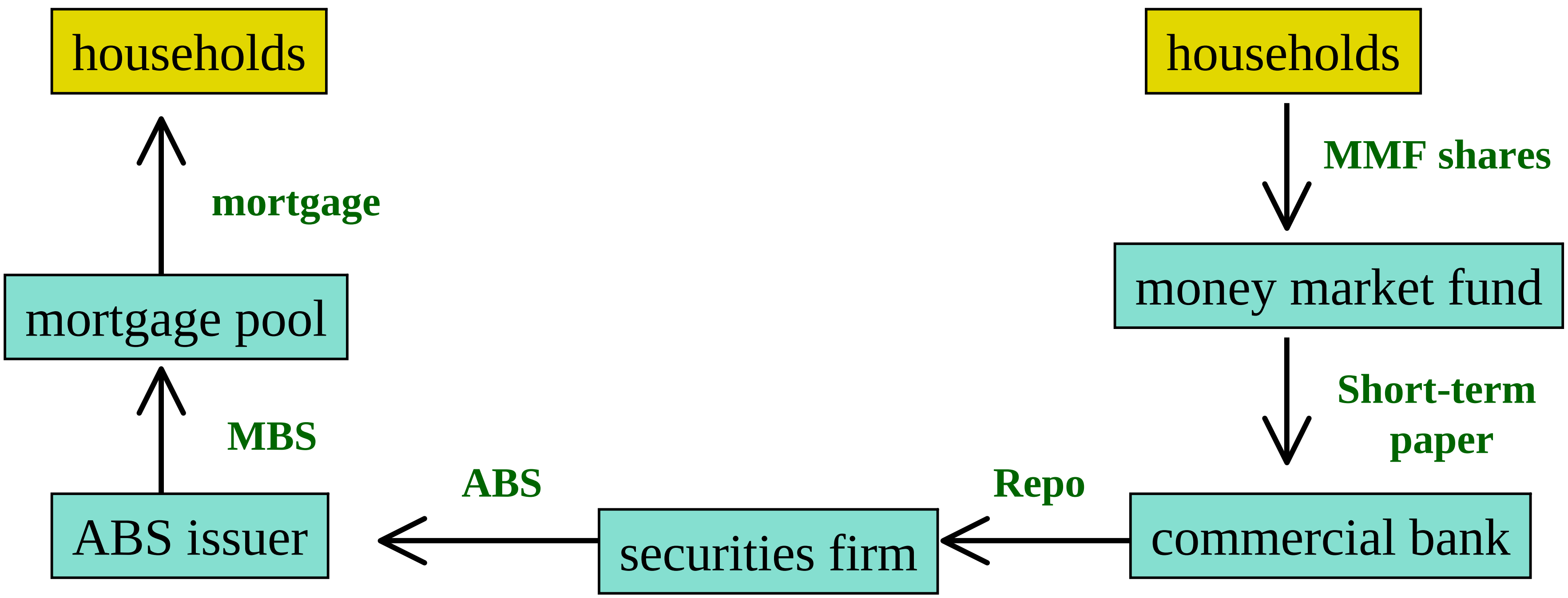
Approach 3: Shortening Intermediation Chains through Development of New Instruments

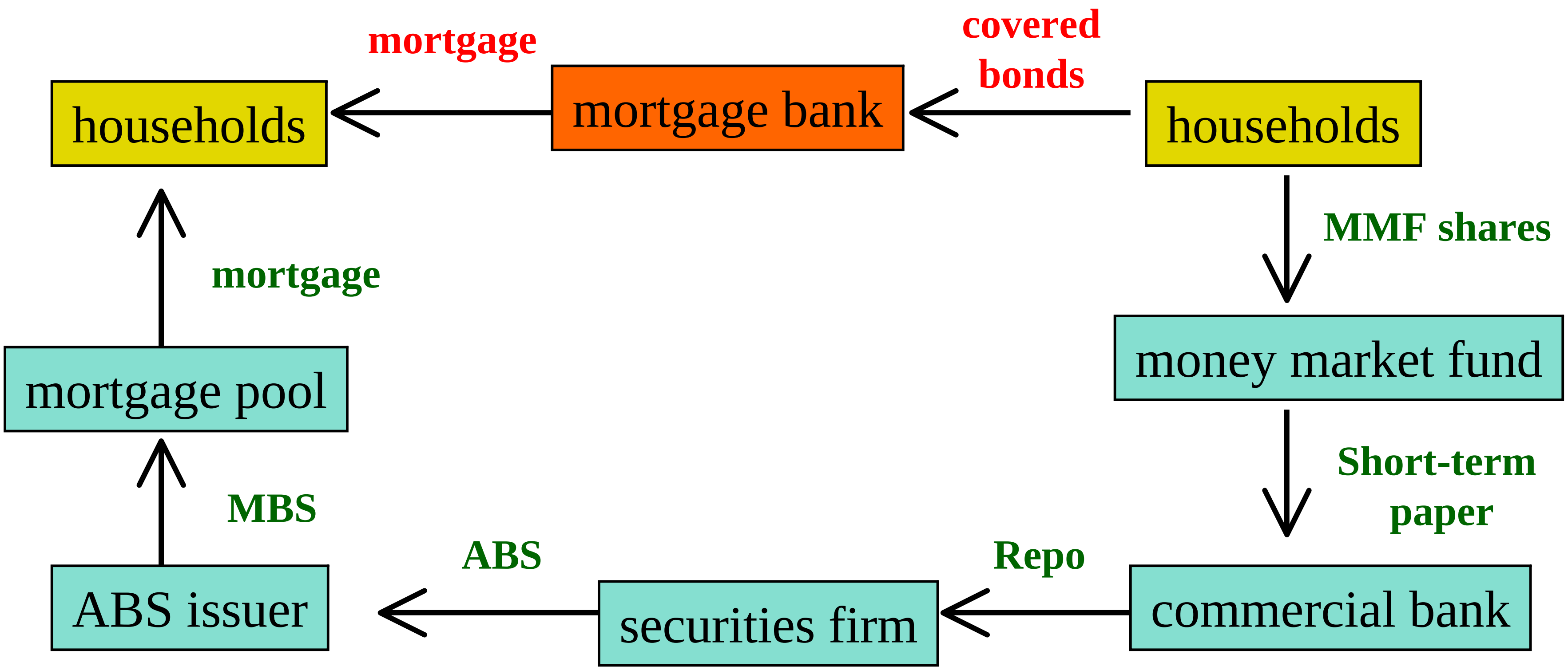
$$\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i$$

Covered bonds

- Danish mortgage bonds
- German pfandbrief bonds

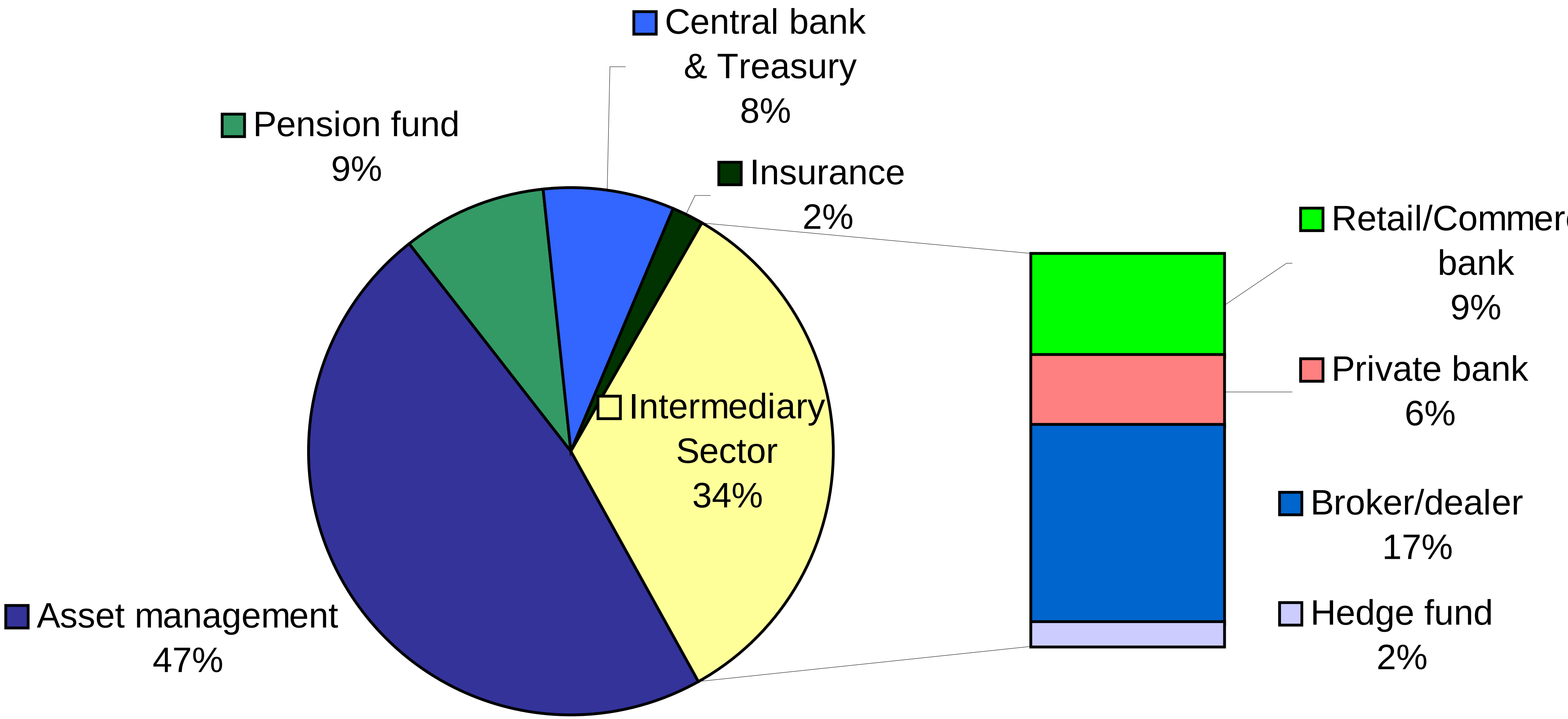
Long Intermediation Chain





mortgage
covered
bonds
households
mortgage bank
households
MMF shares
mortgage
money market fund
mortgage pool
Short-term
paper
MBS
ABS
Repo
ABS issuer
securities firm
commercial bank

Investors in Covered Bonds



Source: SIFMA (2009)

Hurdles to be Overcome

- Seniority of depositors (and hence deposit insurance agency)
  - In the United States, FDIC policy is to restrict covered bonds to 4% or less of total liabilities
  - An alternative is to develop specialist "narrow" covered bond banks who do not take deposits and only issue covered bonds
    - Model provided by mortgage banks in Denmark

Some Features of Possible Future Financial System

- Smaller intermediary sector
  - Especially securities sector
- Shorter intermediation chains
  - Less profitable
  - Less maturity transformation
- With regulatory brakes
- Monetary policy?
- Accounting standards?