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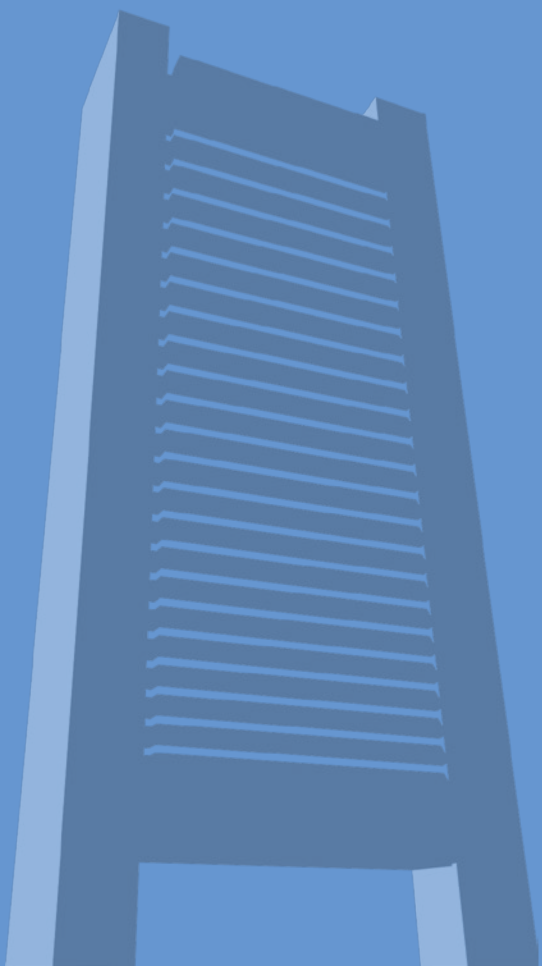

Credit Availability 20 Years after Peek and Rosengren – Panel Discussion

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Credit Crunches Revisited

- Research about the bank credit crunch in the 1990s
  - All members of this panel participated
  - Mechanism was capital-constrained banks responding by shrinking loans (assets), which impacted borrowers with limited alternatives
  - Controversial in 1990s – including with policymakers
- Less controversial now
  - Widely recognized as a potential problem
  - TARP, initial stress test, lending facilities all designed to mitigate possible bank credit crunch

1990s Bank Credit Crunch Versus 2008 Financial Crisis

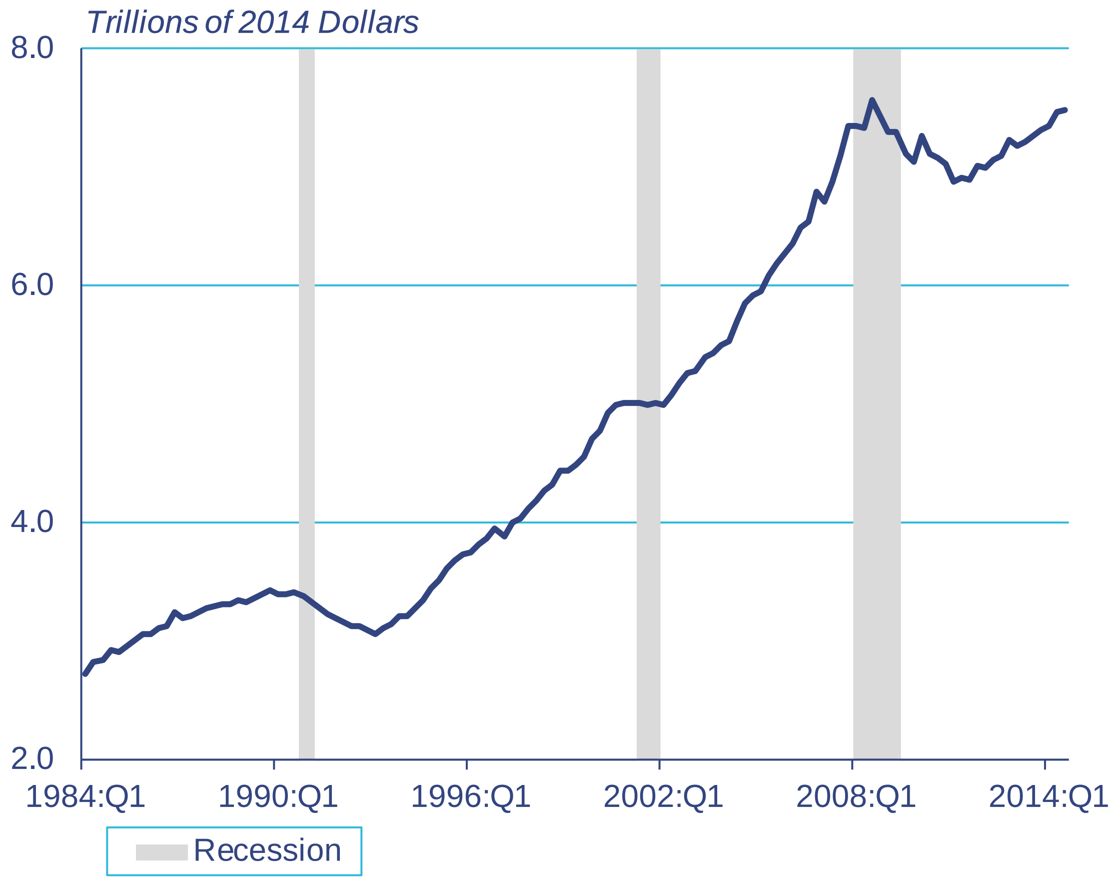
- 2008 had important differences from early 1990s credit crunch with respect to lending
  - Bank lending fell dramatically but recovered relatively quickly, in part because of the rapid recapitalization of banks
  - Non-depository financial intermediaries played a much bigger role in the financial crisis
- The move more toward market-centric financing increased the amplitude of problems
  - Shadow banking and runs
  - Interconnectedness of bank and nonbank intermediaries

Earlier Literature and the Crisis

- An understanding of financial intermediaries is important
  - Earlier literature focused on banks, but non-depository intermediaries played a large role in the economy and crisis
    - Broker-dealers
    - MMMFs
    - Issuers of asset-backed securities
  - Economists, financial economists, and policymakers need a better institutional understanding of “shadow banks”

Figure 1: Total Loans Outstanding at Commercial Banks

1984:Q1 - 2014:Q3

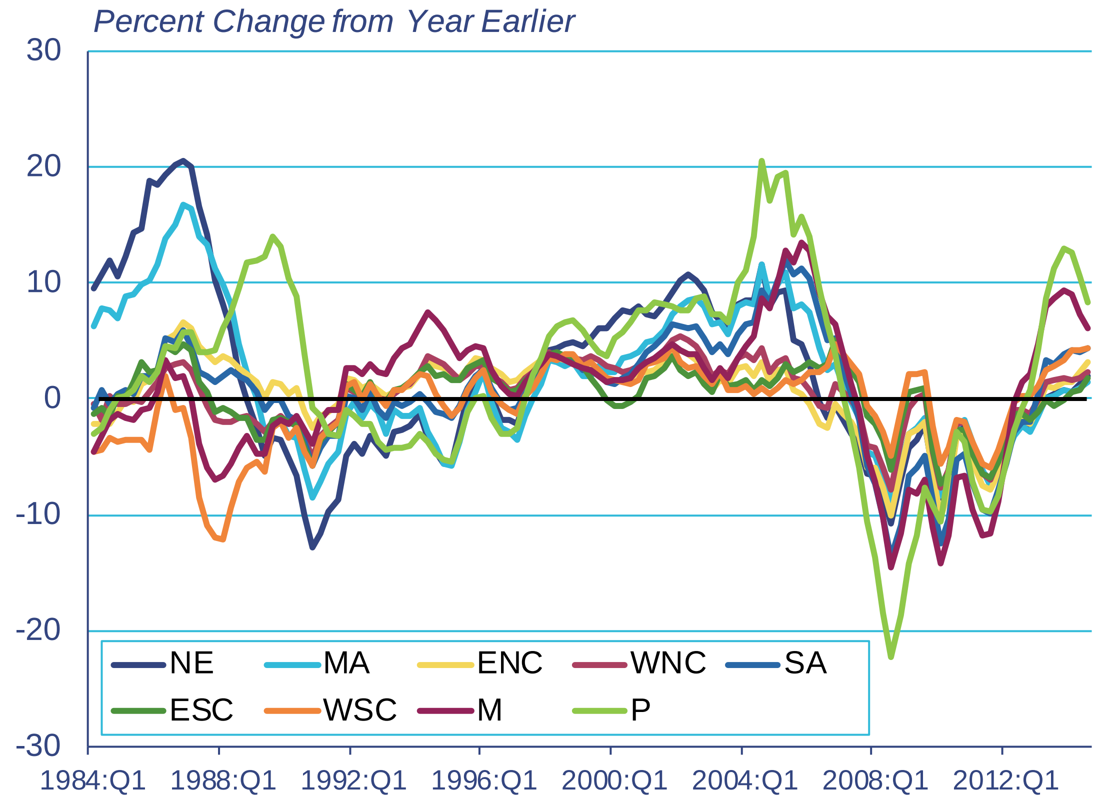


Note: Total Loans Outstanding are adjusted for inflation using the GDP Deflator.

Source: Commercial Bank Quarterly Call Reports, BEA, NBER, Haver Analytics

Figure 2: Growth in Real House Prices by Census Region

1984:Q1 - 2014:Q3

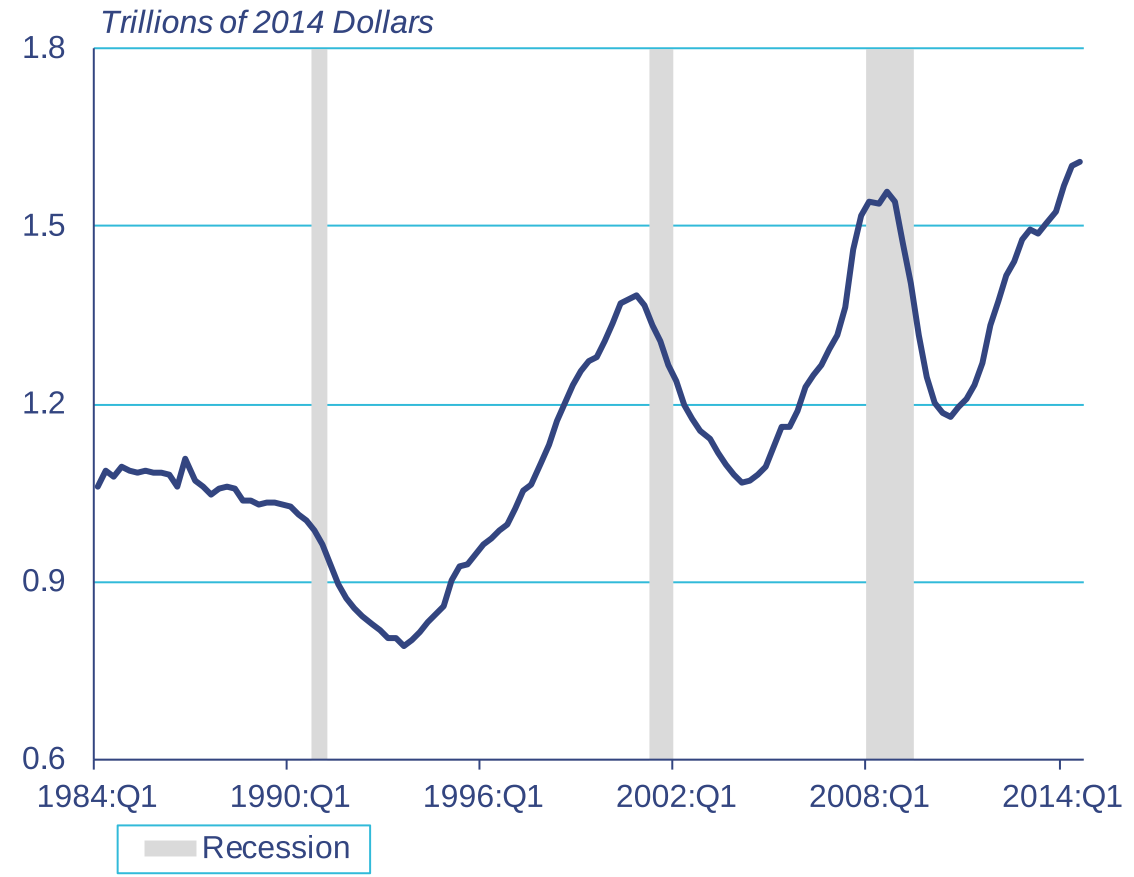


Note: The 9 census regions are: New England (NE), Middle Atlantic (MA), East North Central (ENC), West North Central (WNC), South Atlantic (SA), East South Central (ESC), West South Central (WSC), Mountain (M) and Pacific (P).

Source: Federal Housing Finance Agency, BLS, Haver Analytics

Figure 3: Commercial and Industrial Loans Outstanding at Commercial Banks

1984:Q1 - 2014:Q3

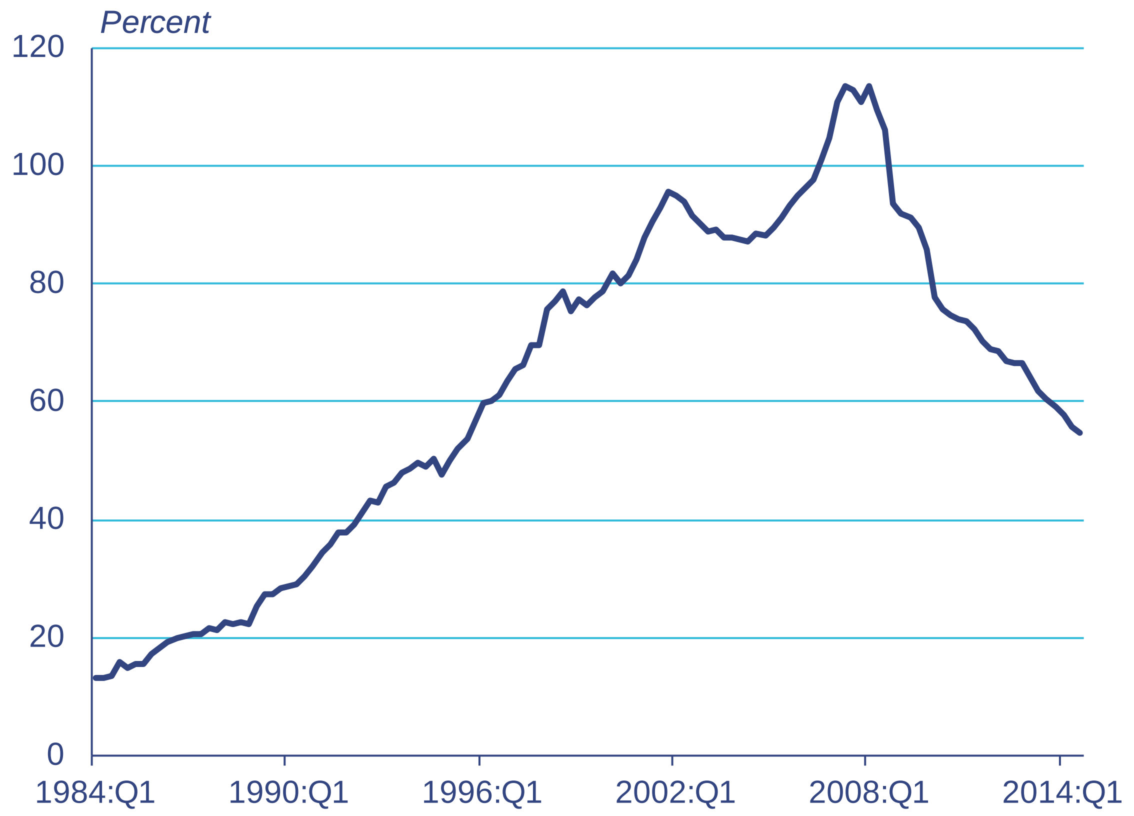


Note: Commercial and Industrial Loans Outstanding are adjusted for inflation using the GDP Deflator.

Source: Commercial Bank Quarterly Call Reports, BEA, NBER, Haver Analytics

Figure 4: Assets of Security Brokers and Dealers, MMMFs, and ABS Issuers Relative to Assets of U.S. – Chartered Depository Institutions

1984:Q1 - 2014:Q3



Source: Federal Reserve Board, Financial Accounts of the United States, Haver Analytics

Lessons from the Earlier Research Applied to the Financial Crisis

- TARP – Need to recapitalize banks quickly
- Initial Stress Tests (Supervisory Capital Assessment Program) – Participants could not meet stress test capital requirements by shrinking assets
- Liquidity programs – Continuing nonbank lending also critical to the economy
- Nonbank assets small relative to banks in 1990, but that had changed dramatically by 2008

Nonbanks Less Resilient in Crisis

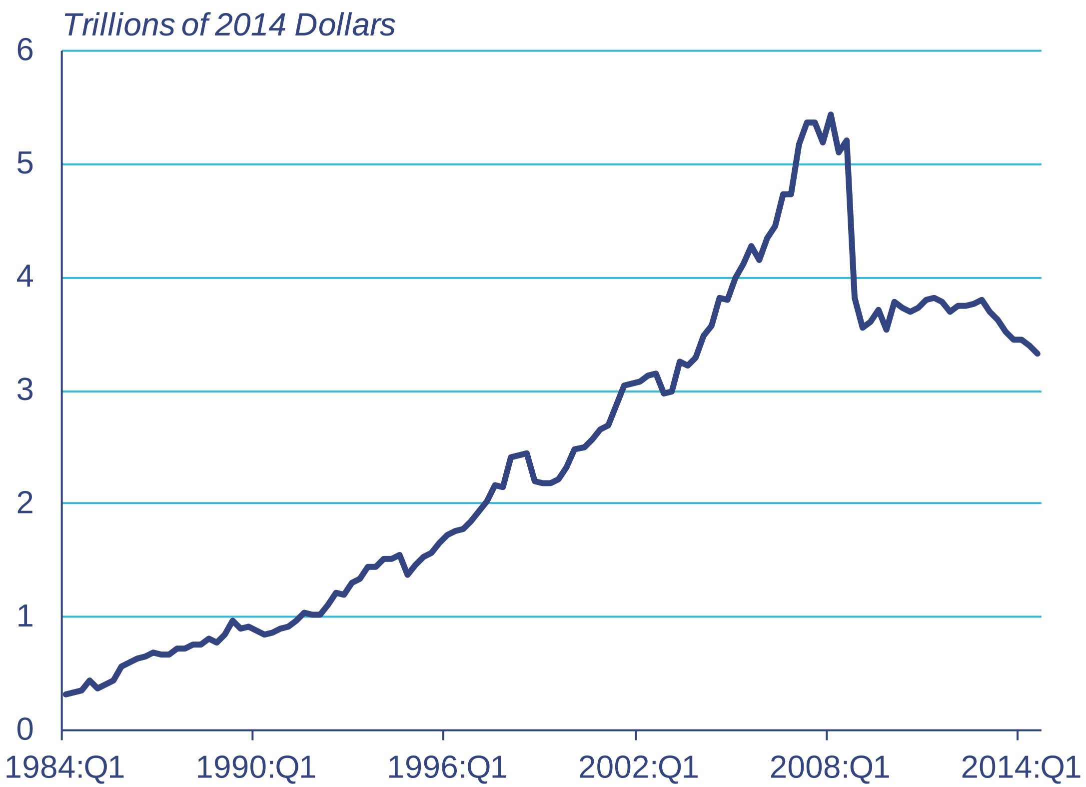
- Bank literature – Capital constraint is important because deposit insurance significantly reduced runs, and banks have access to the discount window
- Nonbanks – Liquidity crisis is critical – liabilities ran, forcing fire sales of assets
  - Re-examine regulation of nonbanks
  - Consider stability of nonbank financial intermediaries
- Nonbanks proved much slower to recover

Broker-Dealers

- Bear Stearns and Lehman Brothers were significant drivers of the financial crisis
- Heavily reliant on wholesale funding – had been assumed that because it was collateralized, it would not run
- No insured deposits and no access to discount window created little opportunity to recover once investors lost confidence
- All large broker-dealers are now in bank holding companies – but that does not resolve run problems

Figure 5: Assets of Security Brokers and Dealers

1984:Q1 - 2014:Q3

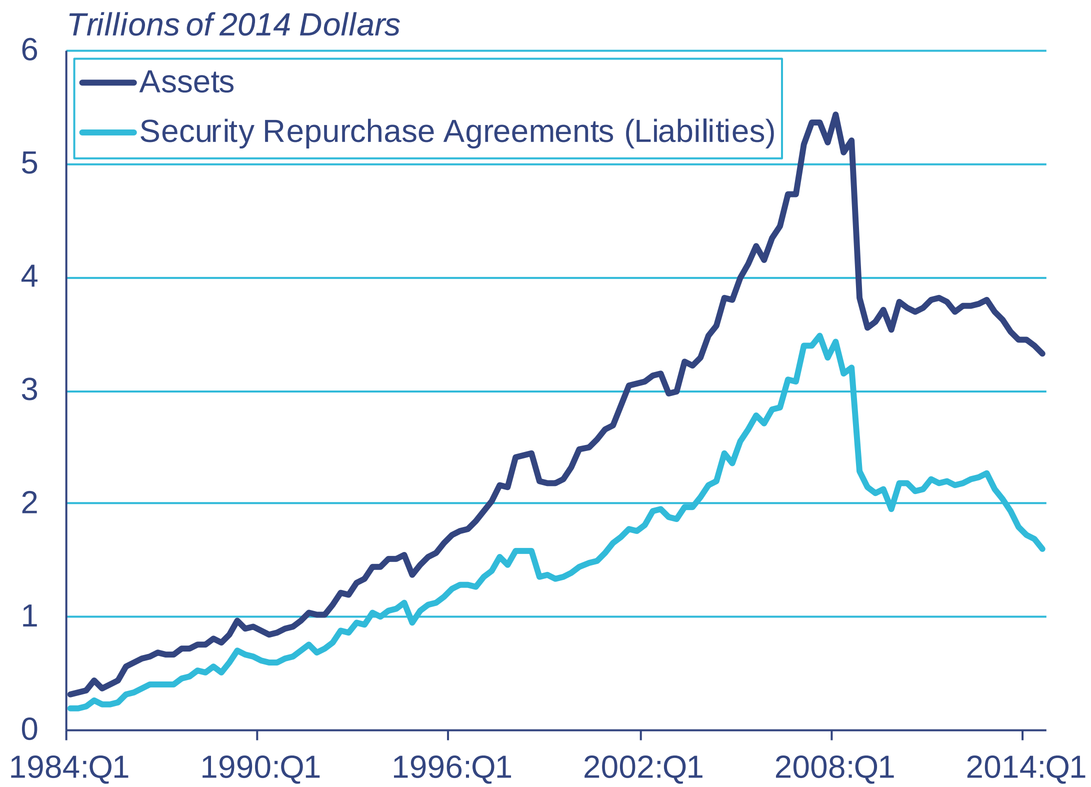


Note: Figures are adjusted for inflation using the GDP Deflator.

Source: Federal Reserve Board, Financial Accounts of the United States, BEA, Haver Analytics

Figure 6: Selected Balance-Sheet Items of Security Brokers and Dealers

1984:Q1 - 2014:Q3



Note: Figures are adjusted for inflation using the GDP Deflator.

Source: Federal Reserve Board, Financial Accounts of the United States, BEA, Haver Analytics

Regulatory Response is Incomplete for Broker-Dealers

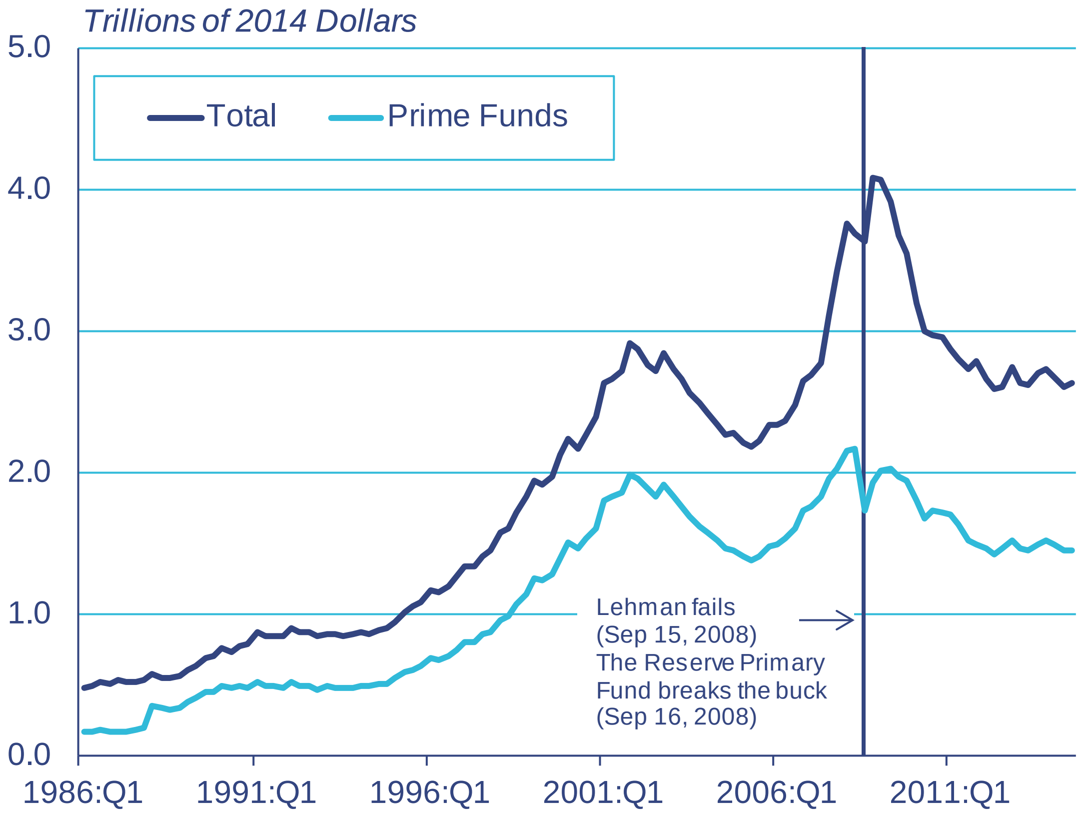
- No change in broker-dealer regulation since the crisis, despite widespread problems
- Being in a bank holding company and having a wholesale funding capital charge will help, but:
  - Discount window is available only for depository institutions
  - Dodd-Frank limits support of non-depository subs, as does the Federal Reserve Act
  - Limited transparency of broker-dealers

Money Market Mutual Funds

- Little academic or policy focus prior to the crisis
- Many assumed they would be stable during financial problems because of SEC limitations
  - Limited to short-maturity assets
  - Limits on credit risk of assets
- Investors often used MMMFs as a transaction account with little perceived difference from insured deposits
- MMMFs hold no capital

Figure 7: Money Market Mutual Fund Assets Under Management

1986:Q1 - 2014:Q3



Note: Figures are adjusted for inflation using the GDP Deflator.

Source: iMoneyNet, BEA

Regulatory Response is Incomplete for Money Market Mutual Funds

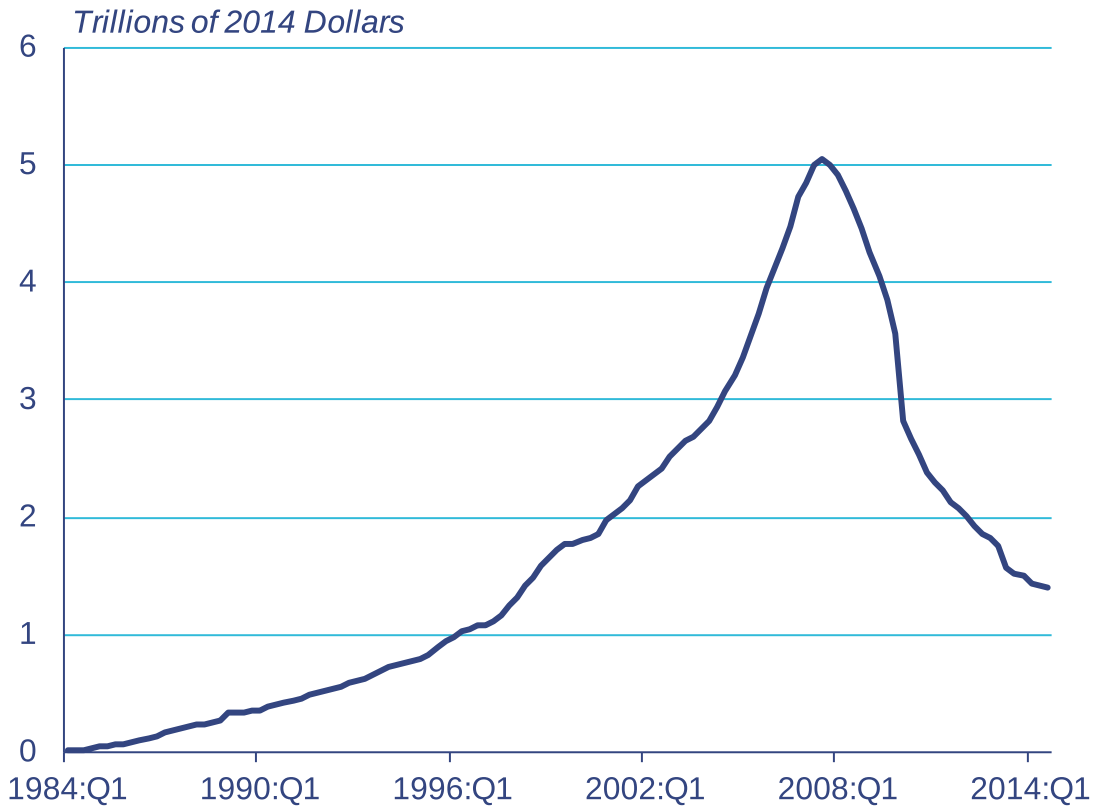
- SEC has adopted rules to improve liquidity and to require institutional prime money market funds to have a floating Net Asset Value
- Still have financial stability concerns
  - Floating NAV does not apply to retail prime MMMFs
  - Allows funds with liquidity problems to impose gates and fees – likely to have unintended consequences, destabilize other funds

Asset-Backed Securities (ABS) Issuers

- Have received little academic attention
- Banks and finance companies removed assets from their balance sheets
- Collect fees, but with less capital at risk
- Major growth since the early 1990s credit crunch
- Structure of short-term financing for risky assets was subject to runs
- Risk retention, legal risk, greater reporting requirements have all restricted use

Figure 8: Assets of ABS Issuers

1984:Q1 - 2014:Q3



Note: Figures adjusted for inflation using the GDP Deflator.

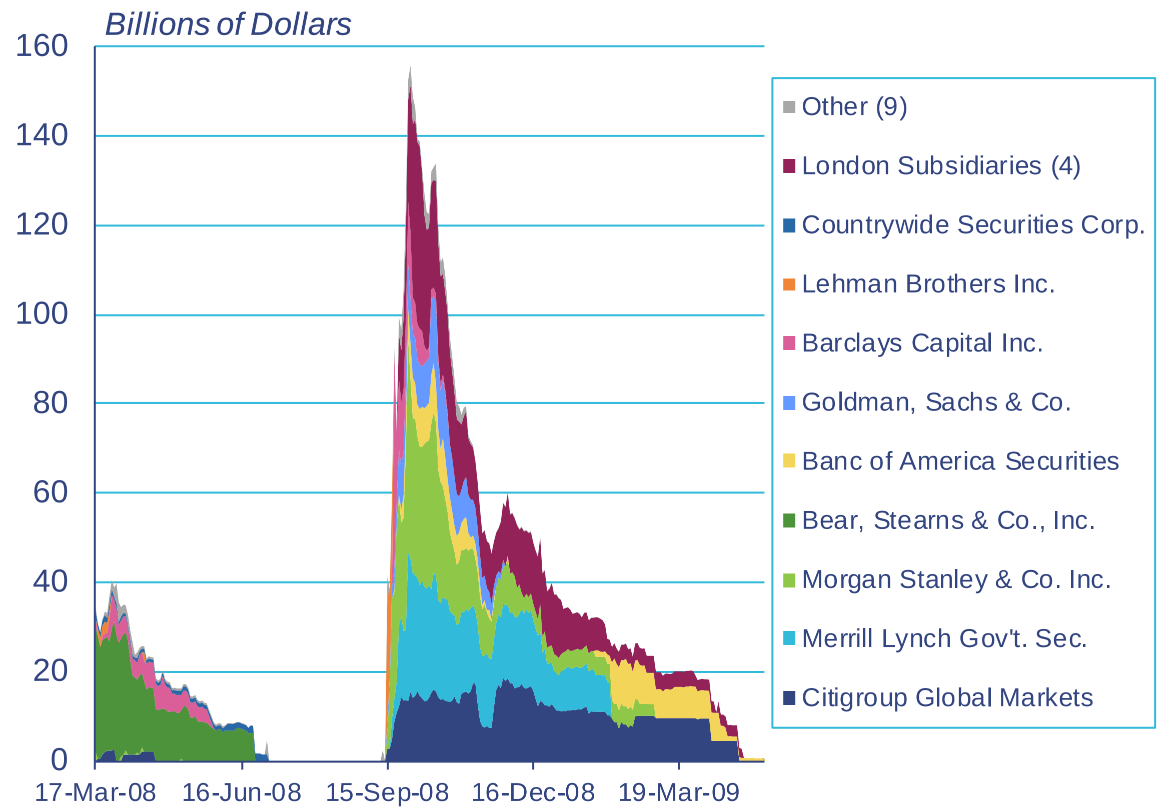
Source: Federal Reserve Board, Financial Accounts of the United States, BEA, Haver Analytics

Fed Lending Facilities Provided Liquidity Lending to Non-Depositories

- Use of 13-3 exemption for discount window necessary for significant lending
- To help with liquidity problems at broker-dealers, Primary Dealer Credit Facility and Term Securities Lending Facility were established
- Without intervention, market making in critical markets may have been impaired as broker-dealers could not finance themselves and were reliant on new facilities

Figure 9: Primary Dealer Credit Facility Loans Outstanding

Daily, March 17, 2008 - May 12, 2009



Note: The London subsidiaries are securities subsidiaries of Citigroup, Goldman Sachs, Merrill Lynch, and Morgan Stanley.

Source: Federal Reserve Board

Figure 10: Term Securities Lending Facility

March 28, 2008 - August 14, 2009

Borrower	Number of Loans	Total Borrowed ($ Millions)
Citigroup Global Market Inc.	65	297,297
RBS Securities Inc.	58	250,399
Deutsche Bank Securities Inc.	52	239,248
Credit Suisse Securities (USA) LLC	53	224,535
Goldman, Sachs & Co.	53	193,020
Barclays Capital Inc.	65	159,284
Merrill Lynch Government Securities Inc.	39	154,192
UBS Securities LLC.	21	109,041
Morgan Stanley & Co. Incorporated	34	101,571
Lehman Brothers Inc.	18	87,023
Banc of America Securities LLC	23	80,189
J.P. Morgan Securities Inc.	23	59,612
BNP Paribas Securities Corp	21	34,965
Countrywide Securities Corporation	10	6,650
HSBC Securities (USA) Inc.	11	3,000
Cantor Fitzgerald & Co.	9	2,598
Bear, Stearns & Co., Inc.	2	2,000
Dresdner Kleinwort Securities LLC	2	1,073
Total	559	2,005,697

Source: Federal Reserve Board

Emergency Support Restricted in the Future

- Financing securities of broker-dealers became a critical problem during crisis
- Dodd-Frank restricts lending and discourages use of exemptions such as 23A and 23B that allowed bank holding companies to finance nonbank subsidiaries
- Without access to liquidity and given run risk in a crisis, we need to rethink broker-dealer regulation

Concluding Observations

- Earlier research on the credit crunch
  - Highlighted need to focus on credit availability
  - Emphasized need for bank recapitalization
- Growth of shadow banks has not received sufficient attention
  - Non-depository problems were quite different, but very important, during the financial crisis
  - Regulatory response remains incomplete to date