Economics 435
The Financial System
(12/6/2017)

Instructor: Prof. Menzie Chinn
UW Madison
Fall 2017
An interpretation of the 2000’s

• Conventional capital flow cycle
• Excess saving abroad
• Low interest rates induce borrowing
• Borrowing by sovereign due to tax cuts, “global war on terror”
• Deregulation/non-regulation of the financial sector (incl. shadow banking system)
• Interaction with the tax system
Government and national borrowing

Note: Budget balance is net lending. Source: BEA
Figure 3. Advanced and Emerging Markets: Sovereign and Corporate Bond Spreads, 1998–2008
(In basis points)

Advanced market corporate bonds (high-grade)
Advanced market corporate bonds (low-grade)
Emerging market sovereign bonds

Source: IMF, WEO update, 11/6/08
Household debt (I)

Source: BIS, Annual Report (2011)
Household debt (II)

Source: BIS, Annual Report (2011)
Lending in the shadow system booms

Source: Federal Reserve Board
Housing boom (I)

Note: Rescaled to 2001Q4=1.
Source: BIS, Annual Report (2011)
Housing boom (II)

Note: Rescaled to 2001Q4=1.
Source: BIS, Annual Report (2011)
Financial Turmoil Timeline (June 2007 - November 2007)

Fed Policy Actions
- 28-Jun: FOMC maintains the target fed funds rate at 5.25%
- 17-Jul: Fed, OTS, FTC, and state agencies launch new program to supervise subprime mortgage lenders
- 10-Aug: Fed issues statement that it stands ready to provide liquidity via the discount window
- 17-Aug: Spread between the primary credit rate and the target fed funds rate is reduced to 50 bp

Market Events
- 23-Jun: Bear Stearns pledges $3.2 bn to aid one of its ailing hedge funds
- 9-Aug: BNP Paribas freezes three funds after being unable to value sub-prime mortgage-based assets
- 13-Sep: Northern Rock receives emergency loan from the Bank of England
- 16-Oct: Citigroup begins a string of major bank writedowns based on subprime mortgage losses
- 27-Nov: Citigroup raises 57.5 bn from the Abu Dhabi Investment Authority

Other Policy Actions
- 26-Jun: SEC begins investigation of 13 CDO issuers
- 10-Oct: Paulson makes statement on "private sector alliance" to prevent mortgage default
Financial Turmoil Timeline (March 2008-May 2008)

Fed Policy Actions

11-Mar Term Securities Lending Facility (TSLF) is introduced and swap lines with the ECB and SNB are increased

14-Mar Fed approves purchase of Bear Steams by JPMorgan

16-Mar The spread between the primary credit rate and target fed funds rate is cut to 25 bp

16-Mar Primary Dealer Credit Facility (PDCF) is created

18-Mar Target fed funds rate is lowered 75 bp to 2.25%

30-Apr Target fed funds rate is lowered 25 bp to 2%

2-May TAF and swap lines increase

2-May TSLF eligible collateral expands to include AAA rated ABS

Market Events

13-Mar Bear Steams reports a $15 bn (88%) drop in liquid assets

14-Mar Bear Steams receives emergency lending from the Fed via JPMorgan

16-Mar JPMorgan announces it will purchase Bear Steams for $2/share

24-Mar JPMorgan's purchase price for Bear Steams increases to $10/share

Other Policy Actions

7-Mar SEC proposes a ban on naked short selling

19-Mar Fannie Mae and Freddie Mac capital requirements are eased to allow for increases in lending
Spreads Rise

Exhibit 2.2 Jumbo Mortgage Spread

Source: BankRate.com.
Exhibit 2.3 Asset-Backed Commercial Paper (ABCP) Yields

Source: Federal Reserve Board.

Exhibit 2.4 Commercial Paper Outstanding

Source: Federal Reserve Board.
Credit Tightening

Exhibit 2.5 Senior Loan Officer Survey

Source: Federal Reserve Board.
Trust Disappears

Exhibit 2.8 Treasury-Eurodollar (TED) Spread

Source: Financial Times. Federal Reserve Board.
Derivatives Downgrade

Exhibit 2.12 ABX Indices (AAA rated vintages)

Source: Goldman Sachs.
Arising from Declining House Prices

Exhibit 3.1 Falling Prices Leave Homeowners with Negative Housing Equity

Note: All data as of December 2006.
Source: First American CoreLogic, Inc.
Foreclosures and House Prices

Exhibit 3.6 Foreclosures Triple in the Housing Bust

Foreclosure Rate Indexed to 100 at Start of Housing Bust:
- US Current Episode
- California
- Massachusetts
- Texas

Source: Mortgage Bankers Association.
# Real Estate Debt and Finance

Exhibit 3.7: Home Mortgage Exposures of US Leveraged Institutions

<table>
<thead>
<tr>
<th>Home Mortgage Debt</th>
<th>Billion ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>11,028</td>
</tr>
<tr>
<td><strong>US Leveraged Institutions</strong></td>
<td></td>
</tr>
<tr>
<td>Commercial banks</td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>1,935</td>
</tr>
<tr>
<td>RMBS</td>
<td>946</td>
</tr>
<tr>
<td><strong>Savings Institutions</strong></td>
<td>1,148</td>
</tr>
<tr>
<td>Direct</td>
<td>895</td>
</tr>
<tr>
<td>RMBS</td>
<td>253</td>
</tr>
<tr>
<td><strong>Credit Unions</strong></td>
<td>361</td>
</tr>
<tr>
<td>Direct</td>
<td>300</td>
</tr>
<tr>
<td>RMBS (estimate)</td>
<td>61</td>
</tr>
<tr>
<td><strong>Brokers and Dealers</strong></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>0</td>
</tr>
<tr>
<td>RMBS (estimate)</td>
<td>213</td>
</tr>
<tr>
<td><strong>Government-Sponsored Enterprises</strong></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>457</td>
</tr>
<tr>
<td>RMBS (estimate)</td>
<td>530</td>
</tr>
</tbody>
</table>

Source: Federal Reserve Board. FDIC. Authors' calculations.
Positive Feedback Loops

Exhibit 4.3 The Leverage Circle

- Target Leverage
- Stronger Balance Sheets
- Increase B/S Size
- Asset Price Boom

- Target Leverage
- Weaker Balance Sheets
- Reduce B/S Size
- Asset Price Decline
Additional Channel

Figure 4
The Two Liquidity Spirals: Loss Spiral and Margin Spiral

Source: Brunnermeier and Pedersen (forthcoming).
Note: Funding problems force leveraged investors to unwind their positions causing 1) more losses and 2) higher margins and haircuts, which in turn exacerbate the funding problems and so on.
## Leverage

### Exhibit 4.5 Leverage of Various Financial Institutions

<table>
<thead>
<tr>
<th></th>
<th>Assets ($bn)</th>
<th>Liabilities ($bn)</th>
<th>Capital ($bn)</th>
<th>Leverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial banks</td>
<td>10793</td>
<td>9693</td>
<td>1100</td>
<td>9.8</td>
</tr>
<tr>
<td>Savings Inst</td>
<td>1914</td>
<td>1687</td>
<td>227</td>
<td>8.4</td>
</tr>
<tr>
<td>Credit Unions</td>
<td>748</td>
<td>659</td>
<td>89</td>
<td>8.4</td>
</tr>
<tr>
<td>Brokers/hedge funds</td>
<td>5397</td>
<td>5226</td>
<td>171</td>
<td>31.6</td>
</tr>
<tr>
<td>GSEs</td>
<td>1633</td>
<td>1567</td>
<td>66</td>
<td>24.7</td>
</tr>
<tr>
<td><strong>Leveraged Sector</strong></td>
<td><strong>20485</strong></td>
<td><strong>18804</strong></td>
<td><strong>1681</strong></td>
<td><strong>12.2</strong></td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on Flow of Funds, FDIC Statistics on Banking, Adrian and Shin (2007), and balance sheet data for Fannie Mae, Freddie Mac, and broker-dealers under Goldman Sachs equity analysts’ coverage.
Exhibit 5.2 Instrumental Variable Estimates of GDP Growth and DNFD

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.904</td>
<td>0.590</td>
<td>1.530</td>
</tr>
<tr>
<td>GDP Growth_{t-1}</td>
<td>0.247</td>
<td>0.118</td>
<td>2.100</td>
</tr>
<tr>
<td>GDP Growth_{t-2}</td>
<td>0.242</td>
<td>0.111</td>
<td>2.190</td>
</tr>
<tr>
<td>GDP Growth_{t-3}</td>
<td>-0.264</td>
<td>0.110</td>
<td>-2.410</td>
</tr>
<tr>
<td>4 quarter DNFD Growth_{t-1}</td>
<td>0.338</td>
<td>0.176</td>
<td>1.920</td>
</tr>
</tbody>
</table>

Exhibit 5.3 GDP Growth with Actual and Fitted Growth in DNFD

Source: Department of Commerce. Authors' calculations.
Losses to Financial System

Figure 1.12. Bank Writedowns or Loss Provisions by Region
(In billions of U.S. dollars unless indicated)

Source: IMF staff estimates.

1 Includes Denmark, Iceland, Norway, Sweden, and Switzerland.
2 Includes Australia, Hong Kong SAR, Japan, New Zealand, and Singapore.