Economics 435
The Financial System
(4/24-29/12)

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UW Madison
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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: Fed. Budget balance is net lending. Source: BEA
Real interest rates

Ten year Treasury rate adjusted by expected inflation

Source: Federal Reserve Board, Philadelphia Fed SPF
The “Disappearance” of Risk

Figure 3. Advanced and Emerging Markets: Sovereign and Corporate Bond Spreads, 1998–2008

(In basis points)

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)

Real residential prices (BIS)

Note: Rescaled to 2001Q4=1.
Source: BIS, Annual Report (2011)
Financial Turmoil Timeline (March 2008-May 2008)

- **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%.
- **2-March**: TSLF eligible collateral expands to include AAA rated ABS.
- **2-May**: Target fed funds rate is lowered 25 bp to 2%.
- **30-May**: Target fed funds rate is lowered.
- **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.
- **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

Net Percentage of Banks Reporting Tightening of Standards:
- Mortgage
- Prime Mortgages
- Credit Cards
- Subprime Mortgages
- Commercial & Industrial

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>5,591</td>
</tr>
<tr>
<td>RMBS</td>
<td>2,881</td>
</tr>
<tr>
<td><strong>Savings Institutions</strong></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>946</td>
</tr>
<tr>
<td>RMBS</td>
<td>1,148</td>
</tr>
<tr>
<td><strong>Credit Unions</strong></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>361</td>
</tr>
<tr>
<td>RMBS (estimate)</td>
<td>253</td>
</tr>
<tr>
<td><strong>Brokers and Dealers</strong></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>300</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>987</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>Leveraged Sector</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)*

- **Expected additional writedowns or loss provisions: 2010:Q3 – 2010:Q4**
- **Implied cumulative loss rate (percent, right scale)**

Source: IMF staff estimates.
1. Includes Denmark, Iceland, Norway, Sweden, and Switzerland.
2. Includes Australia, Hong Kong SAR, Japan, New Zealand, and Singapore.