Economics 435
The Financial System
(4/28-30/12)

Instructor: Prof. Menzie Chinn
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

Source: Federal Reserve Board, Philadelphia Fed SPF

Ten year Treasury rate adjusted by expected inflation

TIPS 10 year
The “Disappearance” of Risk

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

18-Sep
FOMC lowers target fed funds rate 50 bp to 4.75%

31-Oct
FOMC lowers target fed funds rate 25 bp to 4.5%

2-Nov
Fed approves Basel II

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 subprime 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)

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%.

20-Mar
Primary TAF and swap lines increase.

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

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

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.

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.
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

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>Total</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>1,148</td>
</tr>
<tr>
<td>RMBS</td>
<td>946</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>213</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>Dependent Variable Quarterly GDP Growth (at an annual rate)</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
- Realized writedowns or loss provisions: 2007:Q2 – 2010:Q2
- 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.