The Financial Crisis

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Yale

Marinus van Reymerswaele, 1567
What is the “crisis”?  

- What you saw: firms fail, get acquired, or get bailed out (Lehman Brothers, Bear Stearns, Merrill Lynch, AIG); people lose their homes; unemployment rise.
The Crisis

• What you did not see: ALL bond prices fall.
• Why did all bond prices fall? Why not just subprime bond prices?
Subprime Fundamentals and the Interbank Market

LIB-OIS on left-hand Y-axis, ABX spreads on right-hand y-axis.
LIB-OIS and Non-Subprime AAA Assets, 2007-2008
What is a financial crisis?

• A “financial crisis” occurs when households or firms no longer believe that bank debt (money) is worth par – instead they want cash. There is a bank run.

• All financial crises are bank runs.

• Crises are sudden but not irrational.

• Banks do not have the cash, so they are insolvent, if not for government or central bank intervention.
Banks Create Money
Money ➔ Easy to Transact

• No asymmetric information
• Asymmetric info ➔ you lose money to someone better informed than you.
Payoff on Debt At Maturity

Contractual Payoff on Debt

Face Value of Debt

Payoff on Debt

Low Value

Bankruptcy point

Final Value of the Collateral Backing

High Value
The Many Forms of Bank Debt

• Creation of bank trading securities requires backing collateral.
  – Free Banking Era (1837-1863): private bank note issuance required backing of state bonds;
  – Demand deposits: backing by diversified loan portfolios;
  – Sale and repurchase agreements (repo): backed by a specific bond; depositor takes physical possession of the collateral;
  – Asset-backed commercial paper: requires backing of high-grade ABS;
  – Commercial paper: only high-grade issuers.
## Financial Crises, 1870-2008, Selected Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Financial Crisis (first year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1893, 1989</td>
</tr>
<tr>
<td>Canada</td>
<td>1873, 1906, 1923, 1983</td>
</tr>
<tr>
<td>Denmark</td>
<td>1877, 1885, 1902, 1907, 1921, 1931, 1987</td>
</tr>
<tr>
<td>France</td>
<td>1882, 1889, 1904, 1930, 2008</td>
</tr>
<tr>
<td>Germany</td>
<td>1880, 1891, 1901, 1931, 2008</td>
</tr>
<tr>
<td>Japan</td>
<td>1882, 1907, 1927, 1992</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1897, 1921, 1931, 1988</td>
</tr>
<tr>
<td>Norway</td>
<td>1899, 1921, 1931, 1988</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1870, 1910, 1931, 2008,</td>
</tr>
<tr>
<td>United States</td>
<td>1873, 1884, 1893, 1907, 1929, 1984, 2007</td>
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</tbody>
</table>
England, recent crisis
Some U.S. Banking History

• Banking panics have been the norm; the period after FDIC insurance was enacted (1934), till 2007, is the exception.

• Free Banking Era (1837-1862): private money backed by state bonds, but bonds not riskless.


• But, from 1857 to 1934 the problem was demand deposits (backed by bank assets).

• Now, repo.
# U.S. National Banking Era Panics

<table>
<thead>
<tr>
<th>NBER Cycle Peak-Trough</th>
<th>Panic Date</th>
<th>%Δ(C/D)</th>
<th>%Δ Pig Iron</th>
<th>Loss per Deposit $</th>
<th>% and # Nat’l Bank Failures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 1873-Mar. 1879</td>
<td>Sep. 1873</td>
<td>14.53</td>
<td>-51.0</td>
<td>0.021</td>
<td>2.8 (56)</td>
</tr>
<tr>
<td>Mar. 1882-May 1885</td>
<td>Jun. 1884</td>
<td>8.8</td>
<td>-14.0</td>
<td>0.008</td>
<td>0.9 (10)</td>
</tr>
<tr>
<td>Mar. 1887-Apr. 1888</td>
<td>No Panic</td>
<td>3.0</td>
<td>-9.0</td>
<td>0.005</td>
<td>0.4 (12)</td>
</tr>
<tr>
<td>Jul. 1890-May 1891</td>
<td>Nov. 1890</td>
<td>9.0</td>
<td>-34.0</td>
<td>0.001</td>
<td>0.4 (14)</td>
</tr>
<tr>
<td>Jan. 1893-Jun. 1894</td>
<td>May 1893</td>
<td>16.0</td>
<td>-29.0</td>
<td>0.017</td>
<td>1.9 (74)</td>
</tr>
<tr>
<td>Dec. 1895-Jun. 1897</td>
<td>Oct. 1896</td>
<td>14.3</td>
<td>-4.0</td>
<td>0.012</td>
<td>1.6 (60)</td>
</tr>
<tr>
<td>Jun. 1899-Dec.1900</td>
<td>No Panic</td>
<td>2.78</td>
<td>-6.7</td>
<td>0.001</td>
<td>0.3 (12)</td>
</tr>
<tr>
<td>Sep. 1902-Aug. 1904</td>
<td>No Panic</td>
<td>-4.13</td>
<td>-8.7</td>
<td>0.001</td>
<td>0.6 (28)</td>
</tr>
<tr>
<td>May 1907-Jun. 1908</td>
<td>Oct. 1907</td>
<td>11.45</td>
<td>-46.5</td>
<td>0.001</td>
<td>0.3 (20)</td>
</tr>
<tr>
<td>Jan. 1910-Jan. 1912</td>
<td>No Panic</td>
<td>-2.64</td>
<td>-21.7</td>
<td>0.0002</td>
<td>0.1 (10)</td>
</tr>
<tr>
<td>Jan. 1913-Dec. 1914</td>
<td>Aug. 1914</td>
<td>10.39</td>
<td>-47.1</td>
<td>0.001</td>
<td>0.4 (28)</td>
</tr>
</tbody>
</table>
Repo is also Money—but for Companies

- A sale and repurchase agreement ("repo") is a deposit of cash at a “bank” which is short-term, receives interest, and is backed by collateral.
- Repo short term, usually overnight.
- Trading is fast, minimal due diligence.
- Collateral value may exceed the amount of cash deposited, i.e., there is a **haircut**. E.g., deposit $98, receive a bond worth $100—a 2% haircut.
Size of the Repo Market

• There are no official statistics on the overall size of the repo market.

• Unofficially, the US market is likely to be at least $12 trillion, compared to the total assets in the U.S. banking system of $10 trillion.
43% of Available Collateral is ABS/RMBS/CMBS
Securitization

Pooling of Assets

Tranching of Assets

Securitization Investors

- Senior Tranche AAA
- Next Tranche A
- Next Tranche BBB
- Last Tranche Not Sold

Originating Firm Creates Assets

Sells Cash Flows From Pool of Assets

Proceeds of Sale of Assets

Master Trust Pool of Assets
Figure 2: Securitized Banking
Where did the sub-prime risk go?
The Panic

• Haircuts were zero on all asset classes prior to August 2007.

• A change to a positive haircut is a withdrawal from the securitized banking system.

• E.g., bank was financing a bond worth $100 with repo (zero haircut). With a 20% haircut, the bank only receives $80 for the bond. Bank must come up with the extra $20 – the amount withdrawn.
Average Repo Haircut on Structured Debt

Percentage

Date
Summary

• Crises have happened throughout the history of market economies.
• Financial crises are about demands for cash in exchange for bank debt, which takes many different forms.
• The demands for cash are on such a scale—often the whole banking system is run on---that it is not possible to meet these demands because the assets of the banking system cannot be sold without their prices plummeting.
• Banking systems are bailed out.
• Crises are sudden, unpredictable events, although the level of fragility may be observable.
Some Reading

• **Slapped by the Invisible Hand, Gary Gorton**  

• “Securitized Banking and the Run on Repo,” Gorton and Metrick  

• “Regulating the Shadow Banking System,” Gorton and Metrick  

• “Questions and Answers About the Financial Crisis,” Gary Gorton  

• “Haircuts,” Gorton and Metrick  

• **Misunderstanding Financial Crises**, Gorton, Forthcoming Fall 2012.