The Failure Mechanics of Dealer Banks

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Q Group Fall Seminar
Dana Point, California
October 18, 2009
A Large Bank Holding Group’s Lines of Business

- Commercial banking (lending, deposit taking).
- Securities dealing (including securities lending and repo).
- Over-the-counter derivatives dealing.
- Proprietary trading (securities, derivatives).
- Prime brokerage.
- Asset management, including internal hedge funds.
- Merchant banking (oil, metals, foodstuffs, ...).
- Investment banking (underwriting, merger-acquisition, ...).

Duffie (2009)
Table: Dealers invited to an April 1, 2009 meeting on over-the-counter derivatives hosted by the New York Federal Reserve Bank. Source: New York Federal Reserve Bank.

Bank of America, N.A.
Barclays Capital
BNP Paribas
Citigroup
Credit Suisse
Deutsche Bank AG
Dresdner Kleinwort
Goldman, Sachs & Co.
HSBC Group
JPMorgan Chase
Morgan Stanley
The Royal Bank of Scotland Group
Société Générale
UBS AG
Wachovia Bank N.A., a Wells Fargo company
Distress Incentives

▶ **Asset Substitution:** (Jensen and Meckling)
  - Leverage.
  - Maturity transformation and credit risk retention.
  - Voluntary compensation of clients to protect franchise value.

▶ **Debt overhang:** (Myers) Reducing the present value of distress costs is a positive NPV project, but new capital will not be offered because it will go instead to improving the position of creditors.

▶ **Adverse selection:** (Akerlof) Providers of equity and debt financing charge a lemon’s premium against balance-sheet opaqueness.

▶ **Bank run:** (Diamond and Dybvig) Self-fulfilling run by creditors, counterparties, and prime brokerage clients.
Bear Stearns’ Liquidity Pool Over its Last Days ($ billions)

Data Source: Cox (2008)
Short-Run Failure Accelerators

- Exit of prime brokerage clients.
- Run by over-the-counter (OTC) derivatives counterparties.
- Run by short-term creditors, especially repo.
- Lost access to clearing and settlement, including daylight overdraft privileges.
Policy Implications

- New resolution mechanisms to mitigate disruptive firesales.
  - Powers of receiver and conservator apply only to regulated banks.
  - Automatic stays do not apply to executory contracts (swaps, repo).
  - Firesales would be immediate if repo counterparties fail to renew financing.

- Lender of last resort for a wide range of collateral (Tucker).

- Effective central clearing of OTC derivatives (Duffie and Zhu).

- Dedicated repo “utilities” (Bernanke) or other repo market infrastructure measures (BONY).

- Dependence of capital requirements on liability maturity structure.

- Distress-contingent convertible debt (Flannery, Squam Lake Group).
Speculating on Franchise Value: Asset Substitution Weakens Liquidity

Support to distressed off-balance-sheet creditors

- November, 2007, HSBC commits $35 billion to bring the assets of its off-balance structured investment vehicles onto its balance sheet.

- December, 2007, Citigroup brings $49 billion in SIV assets and liabilities onto its own balance sheet.
Speculating on Franchise Value: Asset Substitution Weakens Liquidity

Support to distressed internal hedge funds

- June, 2007, Bear Stearns lends $3.2 billion to its High-Grade Structured Credit Fund.

- August, 2007, Goldman Sachs injects capital into its Global Equity Opportunities Fund.

- February 2008, Citigroup provides $500 million to Falcon, expanding Citi’s balance sheet by $10 billion.
Speculating on Franchise Value: Asset Substitution Weakens Liquidity

Signaling strength when weak

- Avoiding the stigma of the discount window.
- Continuing to make loans, re-strike derivatives, and make two-sided markets as though healthy.
Liquidity Drain by OTC Derivatives Counterparties

- Leveling exposure by entering new positions with up-fronts, or re-striking options, or drawing on lines of credit.

- Novation (asking a different dealer to stand in between the counterparty and distressed dealer) causes cash collateral to depart from prime broker’s control.

- IMF data: Citibank’s OTC derivatives payable exposure (after netting and collateral) decreased from $126 billion in March 2008 to $17 billion as of end-March 2009. Compare to Goldman’s estimated drawdown, from $100 billion to $91 billion.

- Collateral on downgrade. Example: Morgan Stanley, approximately $1 billion per notch.
**Table:** Dealer OTC derivatives exposures. Source: BIS, May 2009.

<table>
<thead>
<tr>
<th>Asset class</th>
<th>Exposure ($ billions)</th>
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</thead>
<tbody>
<tr>
<td>CDS</td>
<td>5,652</td>
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<tr>
<td>Commodity</td>
<td>955</td>
</tr>
<tr>
<td>Equity Linked</td>
<td>1,113</td>
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<tr>
<td>Interest Rate</td>
<td>18,420</td>
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<tr>
<td>Foreign Exchange</td>
<td>3,917</td>
</tr>
<tr>
<td>Unallocated</td>
<td>3,831</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>33,889</strong></td>
</tr>
<tr>
<td><strong>Total after netting</strong></td>
<td><strong>5,004</strong></td>
</tr>
</tbody>
</table>
A -> 100 CDS -> B
CDS-Dedicated CCP Proposals

- U.S. CCPs:
  - ICE.
  - CME.

- European CCPs:
  - NYSE-Liffe-LCH.Clearnet.
  - Eurex.
  - ICE Trust Europe.
  - LCH.Clearnet SA (a French subsidiary of LCH, dedicated to Eurozone CDS clearing).
  - CME Group (London-based clearing of European CDS).
A \xrightarrow{200 \text{ I.R.}} B \xleftarrow{100 \text{ CDS}}
OTC Derivatives Boundary Conditions

- Termination settlement on default or merger-acquisition (including good-bank-bad-bank resolution).

- Executory contracts are exempt from bankruptcy and receivership-conservatorship resolution, including proposed legislation.

- Counterparty to defaulter can exit for replacement or replacement cost.
HEDGE FUND

$200 SECURITIES

$100 MARGIN LOAN

PRIME BROKER

$140 SECURITIES

$120 CASH COLLATERAL

SECURITIES BORROWER
PRIME BROKER'S RESERVE ACCOUNT BALANCE = 0

HEDGE FUND B $100 → PRIME BROKER RESERVE ACCOUNT $100

PRIME BROKER RESERVE ACCOUNT $100 → HEDGE FUND C $100

PRIME BROKER'S OTHER CASH $50 → HEDGE FUND C
Prime Brokerage Clients Run

The franchise values of some dealer banks depends heavily on prime brokerage. Flight by hedge fund clients discourages capital suppliers and drains cash.

**London:** Client assets are commingled with the prime broker’s assets, creating an incentive to run.

**United States:**
- Securities and Exchange Act of 1934, Rules 13c3-2 and 13c3-3: Client’s assets and cash may or may not be segregated. *In aggregate*, free credit balances must be held in a reserve account.
- Margin loans to clients are limited according to advance rates, by asset class. Example: Equities, 50%.
- For each $100 margin loan, a prime broker may re-hypothecate client assets of up to $140.
- The effect: Hedge fund clients may worsen a distressed prime broker’s cash position, *whether or not they run*.

Duffie (2009)
Value of Collateral Received that Can be Pledged

Morgan Stanley

<table>
<thead>
<tr>
<th>Month</th>
<th>Value</th>
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<tr>
<td>Nov 05</td>
<td>798</td>
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<tr>
<td>Nov 06</td>
<td>942</td>
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<tr>
<td>Nov 07</td>
<td>948</td>
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<tr>
<td>May 08</td>
<td>953</td>
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<tr>
<td>Aug 08</td>
<td>877</td>
</tr>
<tr>
<td>Nov 08</td>
<td>294</td>
</tr>
<tr>
<td>Mar 09</td>
<td>283</td>
</tr>
</tbody>
</table>

Data Source: Singh (2009)
Value of Collateral Received that Can be Pledged
Months Spanning Lehman’s Default

Data Source: Singh (2009)
Morgan Stanley's Total Liabilities and "Repo" Portion ($ billions)
DEALER SECURED LENDER

CASH
SECURITIES

DEALER

Secured Lender

Day 0

CASH + INTEREST
SECURITIES

Day 1
Although secured by collateral, repo creditors have no good reason to renew their loans to a distressed dealer.

Dealers usually rely heavily on overnight repo financing.

Repo creditors can discriminate against a distressed dealer in terms of acceptable collateral, haircuts, and collateral valuations.

Firesales or general market stress creates adverse feedbacks on haircuts and collateral valuations. (Brunnermeier-Pedersen).

Tri-party repo:

- Money-market-fund creditors are not permitted to hold many types of collateral, and are permitted to exit term repos on default.
- Tri-party repo clearing banks (BONY-Mellon, JPMorgan-Chase) have discretion in rolling repos and other clearing services.
TRI-PARTY CLEARING BANK

MONEY-MARKET FUND
CASH

DEALER
CASH
SECURITIES
TRI-PARTY CLEARING BANK

MONEY-MARKET FUND

CASH + INTEREST

SECURITIES

DEALER

CASH + INTEREST
TRI-PARTY CLEARING BANK

MONEY-MARKET FUND

BUYER OF SECURITIES

CASH

SECURITIES

FAILED DEALER

SECURITIES
TRI-PARTY CLEARING BANK

MONEY-MARKET FUND

CASH

SECURITIES

SECURITIES BUYER OR SECURED CREDITOR

FAILED DEALER
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- Dependence of capital requirements on liability maturity structure.
CONVENTIONAL DEBT

DISTRESS-CONTINGENT CONVERTIBLE DEBT

EQUITY

ASSETS

NORMAL

DISTRESS

POST-CONVERSION

CONVENTIONAL DEBT

CONVENTIONAL DEBT

EQUITY
**Table:** Quarter-end financing of broker-dealer financial instruments before the failures of Bear Stearns and Lehman (dollars, in billions) Source: King (2008).

<table>
<thead>
<tr>
<th>Financial instruments</th>
<th>May-08 Morgan Stanley</th>
<th>May-08 Goldman Sachs</th>
<th>May-08 Lehman</th>
<th>June-08 Merrill Lynch</th>
<th>Feb-08 Bear Stearns</th>
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<tbody>
<tr>
<td>Financial instruments</td>
<td>390</td>
<td>411</td>
<td>269</td>
<td>289</td>
<td>141</td>
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<tr>
<td>pledged, repledgeable</td>
<td>140</td>
<td>37</td>
<td>43</td>
<td>27</td>
<td>23</td>
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<tr>
<td>pledged, not repledgeable</td>
<td>54</td>
<td>121</td>
<td>80</td>
<td>53</td>
<td>54</td>
</tr>
<tr>
<td>not pledged at all</td>
<td>196</td>
<td>253</td>
<td>146</td>
<td>208</td>
<td>64</td>
</tr>
<tr>
<td>Fraction pledged</td>
<td>50%</td>
<td>39%</td>
<td>46%</td>
<td>28%</td>
<td>55%</td>
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