Systemic Exposures

A 10-by-10-by-10 Approach

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DTCC-NYU Conference
Managing Counterparty Risk and Systemic Risk Under Dodd-Frank
November 17, 2010
New York University

Potential conflicts of interest: See my web page.
Figure: Finding systemic stresses
Figure: Begin with systemically important financial institutions
# Beta Bank Exposure Submission, December 2014

<table>
<thead>
<tr>
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<th>Stress 1</th>
<th>...</th>
<th>Stress j</th>
<th>...</th>
<th>Stress 10</th>
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<td><strong>Self</strong></td>
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<td>Counterparty 1</td>
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<td>Counterparty 10</td>
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Example Stress Scenarios

▶ The default of a single entity.

▶ 4% simultaneous change in all credit yield spreads.

▶ 4% shift of the U.S.-dollar yield curve.

▶ 25% change in a major real-estate index.

▶ 25% change in the value of the dollar.

▶ 25% change in the value of the Euro.

▶ 50% change in the prices of all energy-related commodities.

▶ 50% change in a global equities index.
Change in NPV with a +200 bp Shift of Yield Curve
September, 2008

Number of U.S. Thrifts

<table>
<thead>
<tr>
<th>Change in NPV</th>
<th>Lose NPV</th>
<th>Gain NPV</th>
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</thead>
<tbody>
<tr>
<td>&lt;-40%</td>
<td>25</td>
<td>25</td>
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<tr>
<td>-40 to -30%</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>-30 to -20%</td>
<td>154</td>
<td>154</td>
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<tr>
<td>-20 to -10%</td>
<td>246</td>
<td>246</td>
</tr>
<tr>
<td>-10 to 0%</td>
<td>207</td>
<td>207</td>
</tr>
<tr>
<td>0 to 10%</td>
<td>60</td>
<td>60</td>
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<tr>
<td>&gt;10%</td>
<td>8</td>
<td>8</td>
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</table>

Data: Office of Thrift Supervision
Default Exposures of U.K. Banks to Hedge Funds in April 2010

Source: UK FSA
Preliminary Ideas for Measurement Standards

▶ The mark-to-market gain or loss, before collateral and after enforceable netting.

▶ The mark-to-market gain or loss, after collateral and enforceable netting

▶ On a cash-flow basis, within a prescribed time period such as 30 days.
For each of 10 stresses, each systemically important firm reports its gain or loss, and its 10 largest bilateral gains or losses.

The identities of these top 10 counterparties are reported, stress by stress.

One of the stresses is the failure of a counterparty. The reported impact is inclusive (through debt, equity, derivatives, and other direct default exposures).

The regulator receives all data. The public receives aggregate data, for example histograms.

Reporting is quarterly, at least, based on within-period averages.

Reports are at the holding-company level, and for national subsidiaries where required locally.
Key Applications

- Supervisory monitoring of systemically important financial institutions.

- Identification of additional systemically important financial institutions.

- Providing systemic risk information to regulators, investors, and other market participants, so that these risks are better priced, and managed.
Common Questions about this Approach

Question: Won’t this approach miss risks associated with long-short strategies, like the natural-gas spread trade that killed Amaranth?

Answer: One can put on the list any key stress scenarios, including those of long-short or other strategies, but I suspect that the most systemic risks are to asset classes that are, in *net*, very large.
Common Questions about this Approach

Question: Won’t this approach miss important systemic risks that are widely dispersed throughout the economy, but do not flow through the biggest financial institutions?

Answer: Yes. For example, this approach would probably have missed the Savings-and-Loan Crisis of the 1980s. The focus here is on too-big-to-fail institutions.
Common Questions about this Approach

Question: Aren’t the counterparty exposures of major financial institutions normally small?

Answers:

▶ Yes, after netting and collateral, but not before.

▶ Greece, Freddie Mac, and AIG were counterexamples.

▶ This approach is not restricted to counterparty risk.
Common Questions about this Approach

Question: Won’t the next crisis probably arise from a scenario that won’t be on the list of key stresses?

Answer: I hope so.