Systemic Risk Monitoring

A 10-by-10-by-10 Approach

Darrell Duffie
Stanford University

Conference Organized by Moody's and London Business School
London, May, 2011

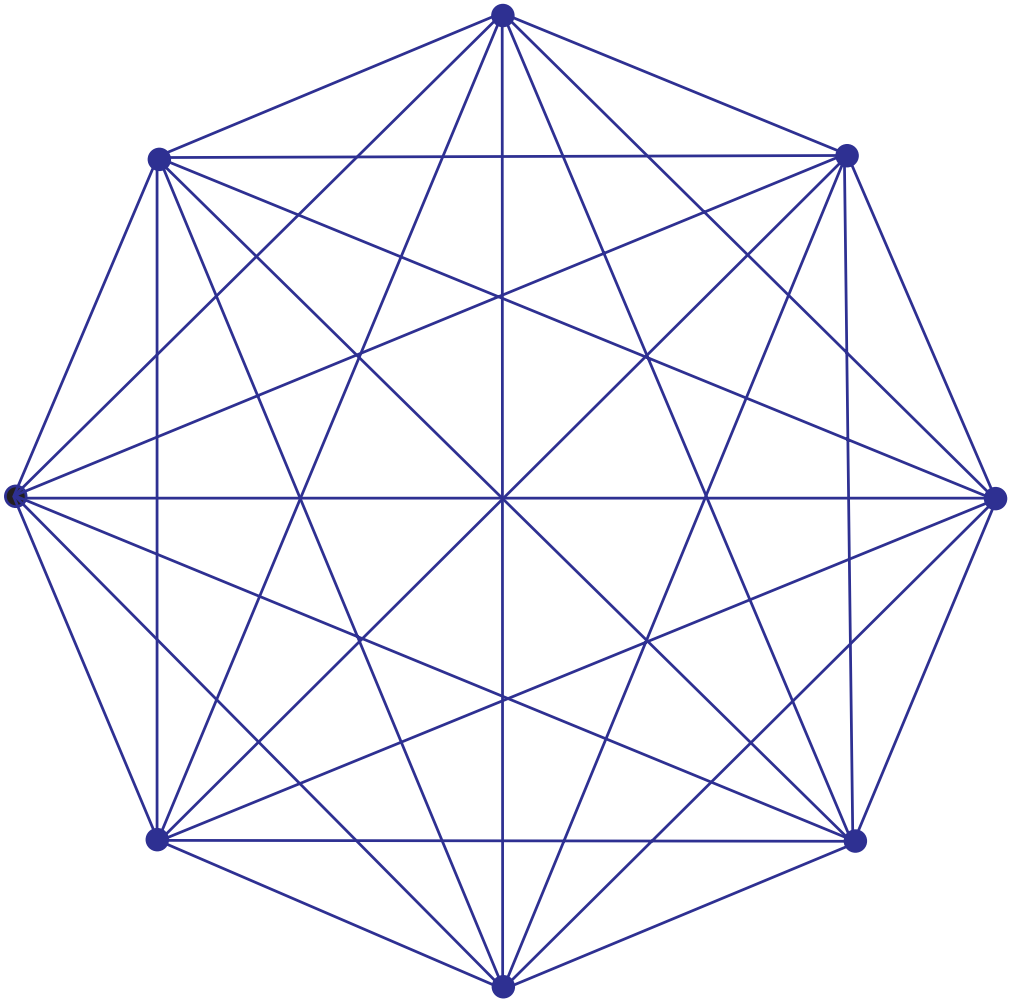


Figure: Finding systemic stresses

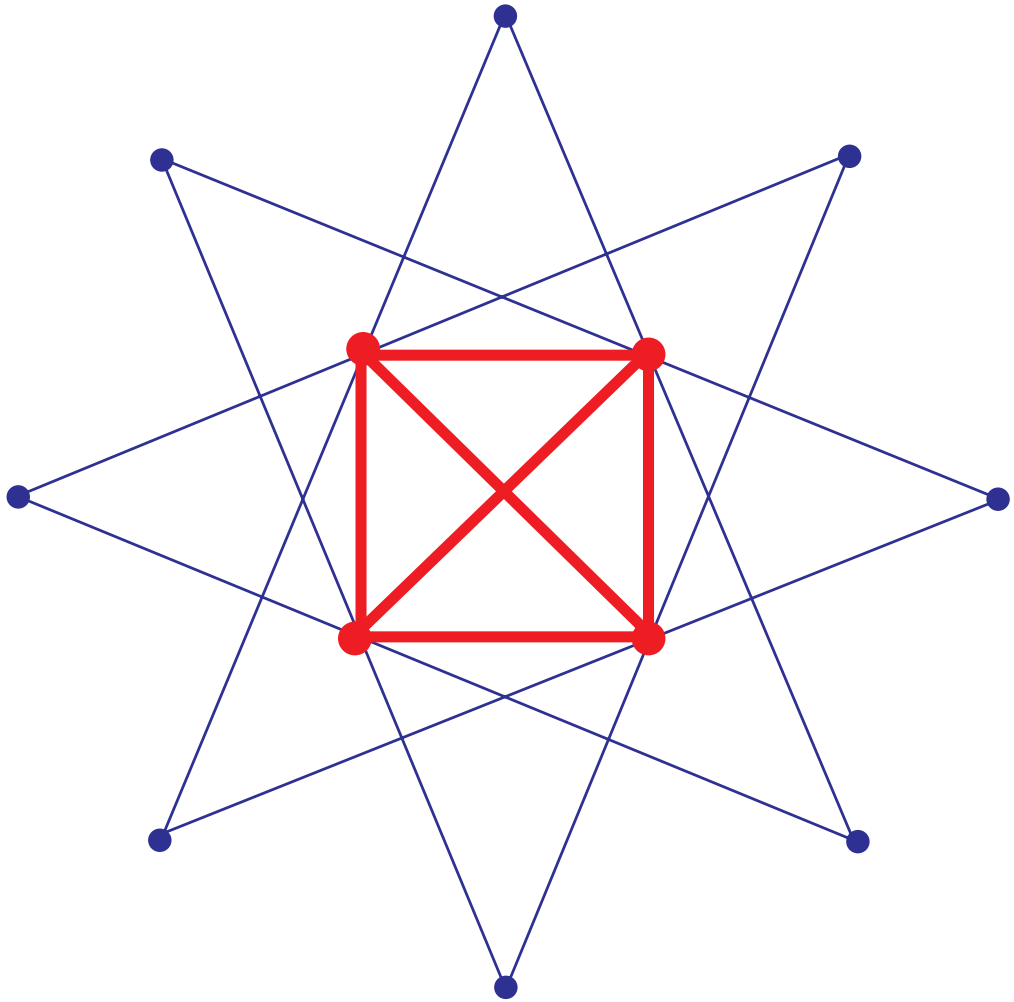
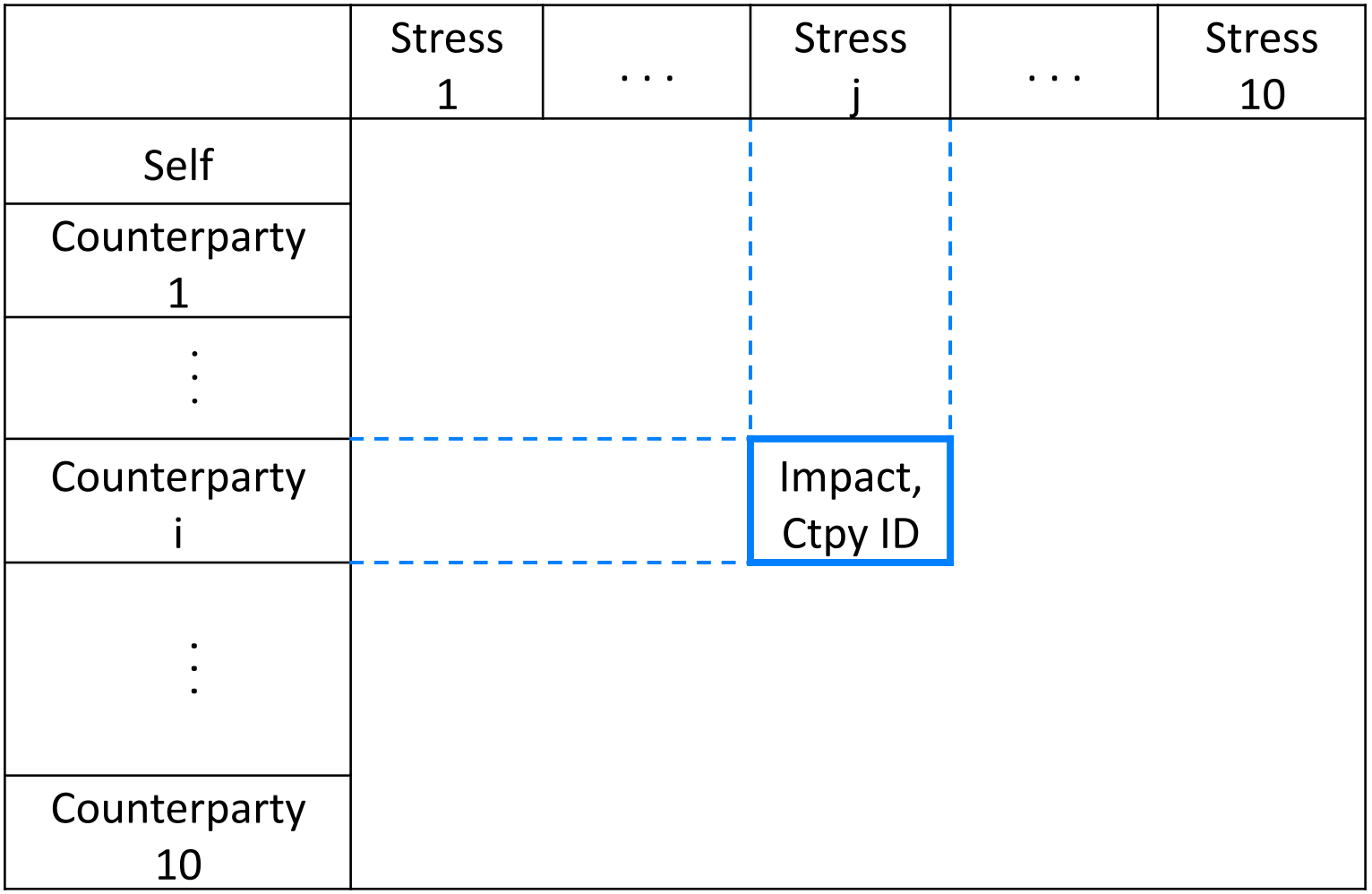


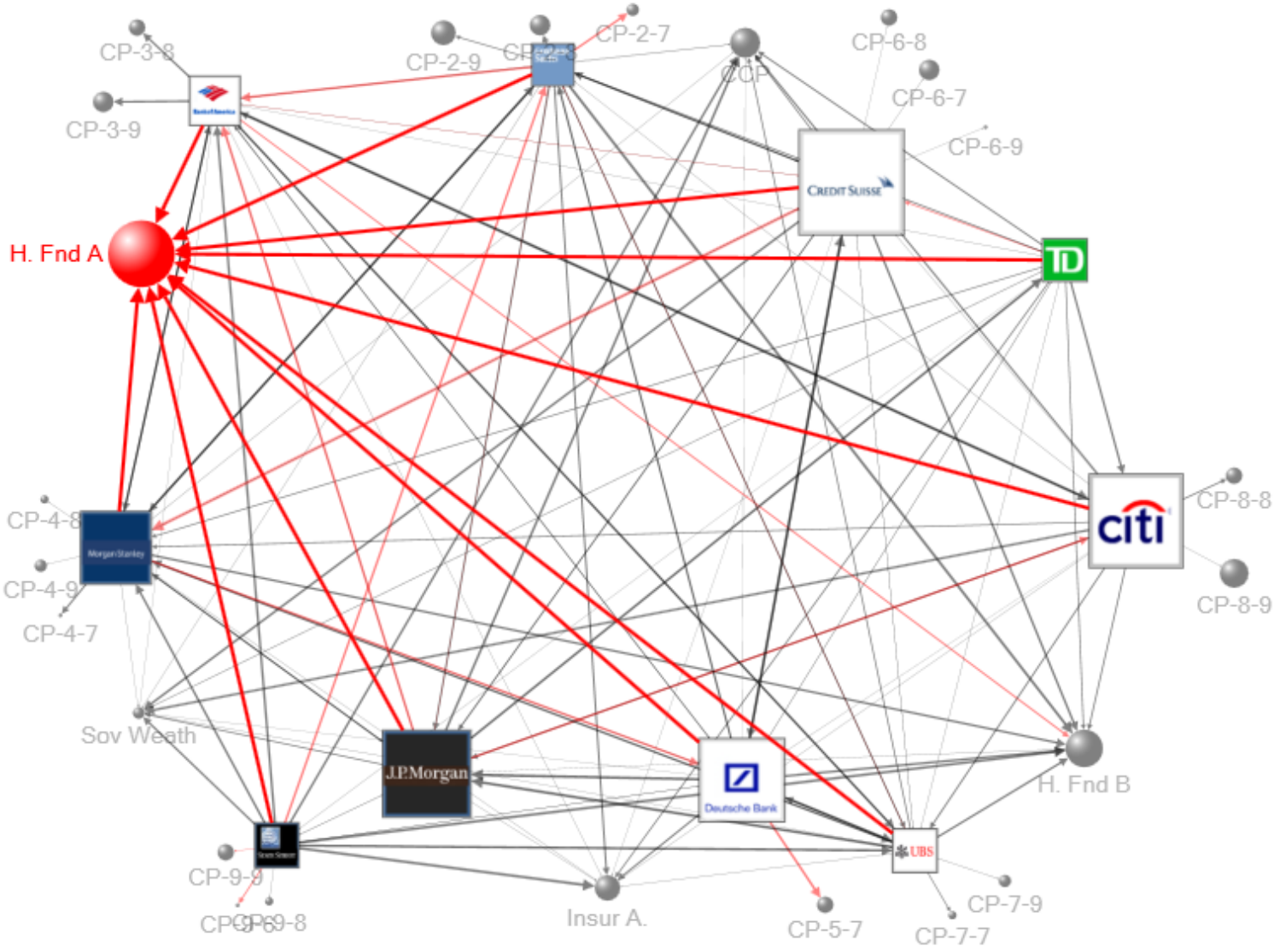
Figure: Begin with systemically important financial institutions

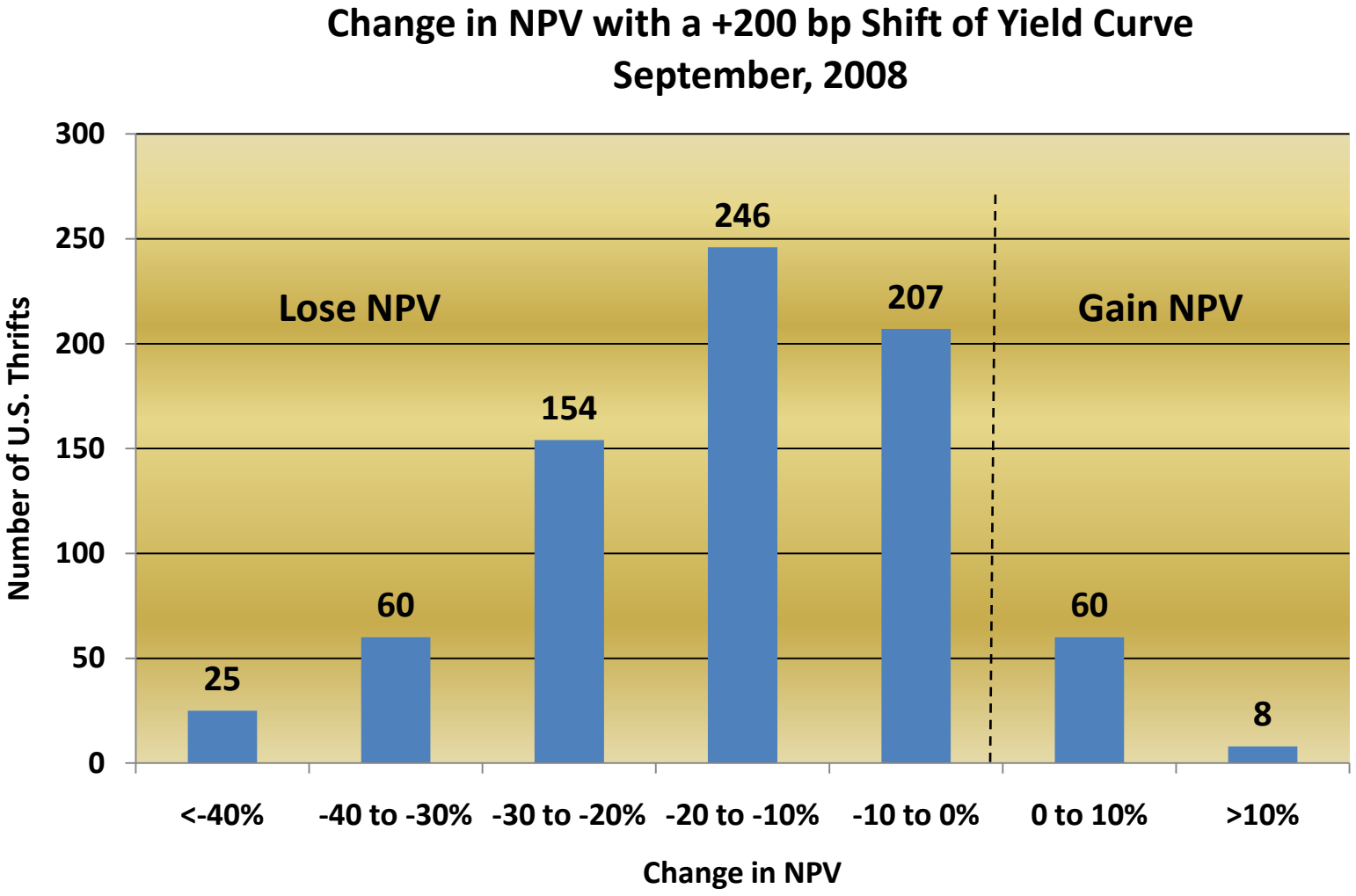
Beta Bank Exposure Submission, December 2014



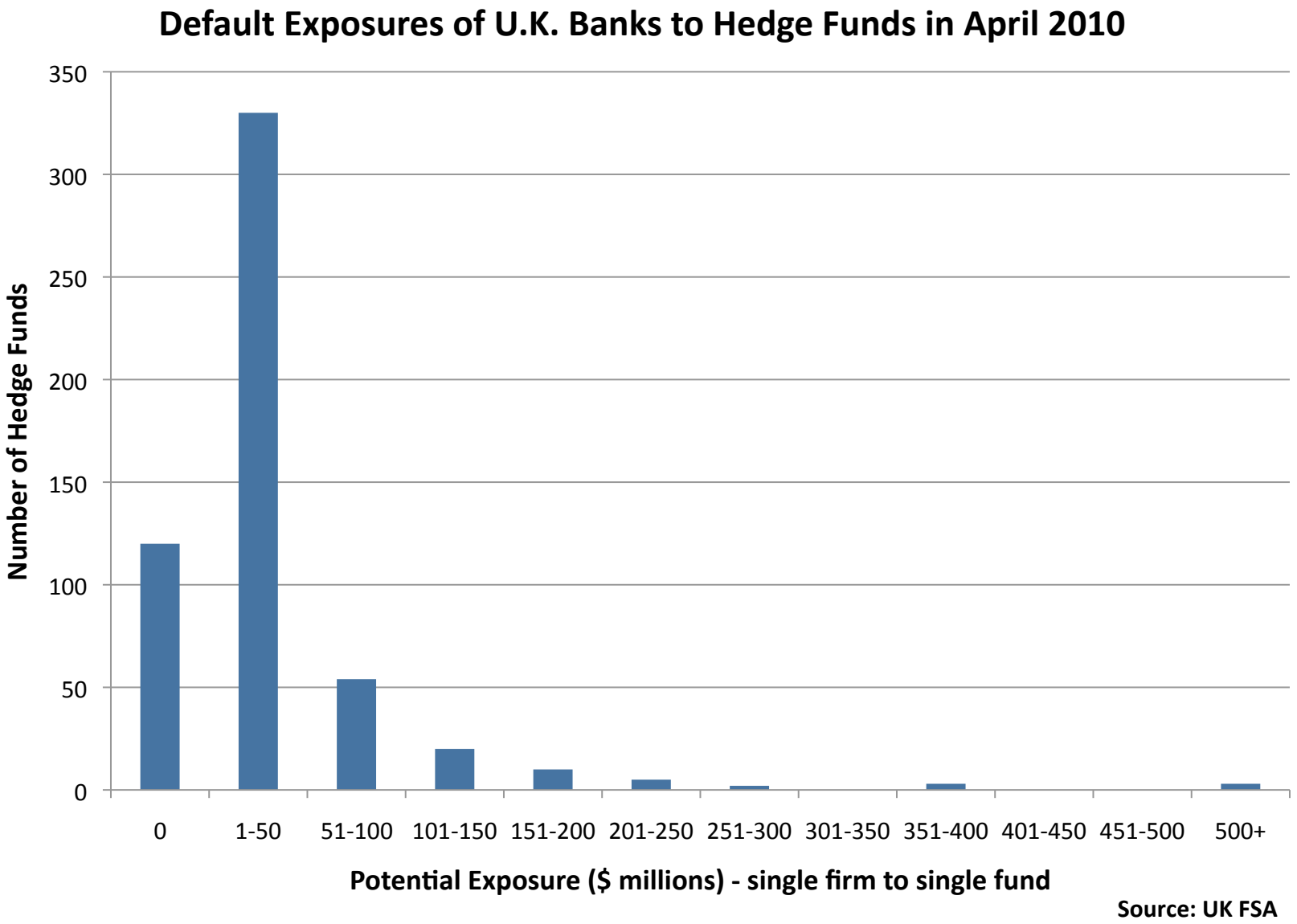
Example Stress Scenarios

- 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.


CP-3-8
CP-3-9
CP-2-9
CP-2-7
CCP
CP-6-8
CP-6-7
CP-6-9
H. Fnd A
CREDIT SUISSE
TD
citi
CP-8-8
CP-8-9
CP-4-8
CP-4-9
CP-4-7
Sov Wealth
J.P.Morgan
Deutsche Bank
UBS
H. Fnd B
CP-9-9
CP-9-8
Insur A.
CP-5-7
CP-7-9
CP-7-7



Data: Office of Thrift Supervision


Default Exposures of U.K. Banks to Hedge Funds in April 2010
Number of Hedge Funds
350
300
250
200
150
100
50
0
0
1-50
51-100
101-150
151-200
201-250
251-300
301-350
351-400
401-450
451-500
500+
Potential Exposure ($ millions) - single firm to single fund
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.

A Summary of The Proposal

- 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.