



**THE NATIONAL ACADEMIES**  
*Advisers to the Nation on Science, Engineering, and Medicine*

**NEW DIRECTIONS  
FOR UNDERSTANDING SYSTEMIC RISK**

A CONFERENCE COSPONSORED BY  
**THE FEDERAL RESERVE BANK OF NEW YORK** AND **THE NATIONAL ACADEMY OF SCIENCES**

**FEDERAL RESERVE BANK OF NEW YORK  
33 LIBERTY STREET, NEW YORK, NEW YORK**

**MAY 18-19, 2006**

**THURSDAY, MAY 18**

**7:45-8:30 REGISTRATION AND BREAKFAST**

**8:30-8:45 WELCOME AND OVERVIEW OF CONFERENCE GOALS**

Christine M. Cumming, First Vice President and Chief Operating Officer,  
Federal Reserve Bank of New York

Charles Lucas, Member, Board of Mathematical Sciences, National  
Academy of Sciences

Industry consolidation, global networking, terrorist threats, and heavy dependence on computing: these and other trends introduce the possibility of new systemic risks, perhaps with increased ramifications. Ms. Cumming and Mr. Lucas will discuss the importance of understanding and managing systemic risk and set the stage for the conference as an opportunity for the central banking community to take a fresh look at systemic risk, aided by the insights of researchers who study similar risks in other complex systems.

**8:45-9:45 BACKGROUND ON SYSTEMIC RISK IN THE FINANCIAL SECTOR**

Speakers: Darryll Hendricks, UBS  
Thomas Daula, Morgan Stanley  
D. Wilson Ervin, Credit Suisse

Three presentations will help to identify key issues relating to systemic risk in financial markets and institutions, describe the structure of financial markets,

and give historical examples of risks that concern central bankers and market practitioners.

**9:45-10:00 COFFEE BREAK**

**10:00-12:30 PANEL DISCUSSION ON CURRENT RESEARCH DIRECTIONS**

Panelists: Roberto Rigobon, Massachusetts Institute of Technology  
Hyun Song Shin, Princeton University  
Markus K. Brunnermeier, Princeton University  
Lasse Pedersen, New York University

Chair: Franklin Allen, Wharton School, University of Pennsylvania

A panel of experts in systemic risk in the financial sector will present a cross-section of current work in this area. The chair will raise discussion topics for the panel and then serve as moderator during a question-and-answer session with the audience.

**12:30-1:45 LUNCH, WELCOME, AND KEYNOTE SPEAKER – LIBERTY ROOM**

Welcome and introduction by Tim Geithner, President of the Federal Reserve Bank of New York

Keynote speaker: Donald L. Kohn, Governor, Board of Governors of the Federal Reserve System

**1:45-4:00 PANEL DISCUSSION: MODELS OF SYSTEMIC PHENOMENA IN OTHER COMPLEX INTERACTIVE SITUATIONS**

Panelists: Yacov Haimes, University of Virginia  
Massoud Amin, University of Minnesota

Chair: Charles R. Taylor, Risk Management Association

Two researchers who model systemic phenomena in nonfinancial systems will each make a 45-minute presentation. The first of these explores concepts and methods for analyzing risk in complex engineered systems. The second outlines concepts and methods for modeling systems, infrastructure reliability, and catastrophic failures in complex networks such as power grids. The speakers will address the treatment of heavy-tailed events, the modeling of networks, and the identification of vulnerabilities. These discussions are designed for a mathematically sophisticated audience. The session chair will compare and contrast the approaches with those typically applied in studies of systemic risk in the financial sector and then open the floor for discussion.

**4:00-4:15 COFFEE BREAK**

**4:15-5:30      PRESENTATION ON SYSTEMIC DYNAMICS IN THE FEDERAL FUNDS MARKET**

Darrell Duffie, Stanford University  
Adam Ashcraft, Federal Reserve Bank of New York

The presenters will discuss preliminary results of a simulation of the systemic risk arising from settlement flows in the Fed Funds markets.

**5:30-7:30      DINNER – LIBERTY ROOM**

**7:30              FIRST DAY OF THE CONFERENCE ADJOURNS**

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**FRIDAY, MAY 19**

**7:30-8:00      BREAKFAST**

**8:00-10:15    PANEL DISCUSSION: MODELS OF RISKS FACING COMPLEX SYSTEMS**

Panelists:      Simon Levin, Princeton University  
                    Morten Bech, Federal Reserve Bank of New York  
                    Walter E. Beyeler, Sandia National Laboratories  
                    Robert J. Glass, Sandia National Laboratories

Chair:            George Sugihara, University of California, San Diego

This session presents two talks about the risks facing complex systems. The first speaker explores concepts and methods for analyzing behaviors of ecosystems, especially as they adapt to or approach precipitous changes. The second talk, by a cross-disciplinary team of researchers, presents a pilot attempt to analyze critical nodes in the financial transaction system using tools and concepts that are not in common use in the central banking community. A discussion with all conference participants will follow.

**10:15-10:30    Coffee Break**

**10:30-12:00    WRAP-UP PANEL DISCUSSION: WHAT HAS BEEN LEARNED?**

Panelists:      Douglas Gale, New York University  
                    Robert Litzenberger, Azimuth Trust  
                    George Sugihara, University of California, San Diego  
                    Vincent Reinhart, Board of Governors of the Federal Reserve System

Chair: Timothy Geithner, President, Federal Reserve Bank of New York

Panelists from the fields of finance, economics, and science will share observations on the conference's findings and offer thoughts for the road ahead. All conference participants will be invited to respond.

**12:15-1:30 LUNCHEON – LIBERTY ROOM**

Participants are invited to join informal lunch table discussions that will be organized on several of the topics raised during the conference; the topics will be announced during the conference.

**1:30 CONFERENCE ADJOURNS**

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Papers for selected presentations will be posted to the conference website as they become available in advance of the conference. Any revisions to the agenda will be posted to the website as well, which can be found on the Internet at the following address:

<https://www.newyorkfed.org/registration/research/risk/form.cfm>.