The Uncertainties of Managing Catastrophic Risks

Public Private Partnership 2000

Report on Second Forum

11 December 1997

On December 11th, 1997, PPP 2000 held its second forum on natural disaster reduction, "The Uncertainty of Managing Catastrophic Risks," which was cosponsored by the University of Pennsylvania's Wharton School. More than 100 participants from academia, Wall Street, non-governmental organizations, and Federal, State and local Government discussed the interdependent roles of the private and public sectors in creating incentives and institutions to expand our capacity for managing natural disaster risk. Discussion focused on innovative approaches including new financing mechanisms of insurance, re-insurance and capital markets, as well as increased incentives for mitigation. This forum expanded on the theme developed in the first forum that the financial capacity of the insurance industry is inadequate to cope with a megadisaster such as a repeat of the 1906 San Francisco earthquake (estimated losses of $100 billion) or even a major East Coast hurricane (estimated losses of $75 billion).

Mitigation: Modern modeling techniques allow us to identify cost-effective mitigation methods which can be expected to benefit property owners, improve the solvency of primary insurers and reinsurers, and reduce the need for costly post-disaster aid by government agencies. However, research on consumer decision making shows that the benefits of mitigation are not recognized by the vast majority of homeowners due to their misperception of the risk, their short-term outlook, and the upfront costs. Consequently, adoption of mitigation must be encouraged by the public and private sectors through education on true risks and benefits and through explicit incentives such as the following : (1) lowering insurance rates and deductibles for those who invest in effective measures and (2) linking lower insurance premiums to long-term loans for mitigation, which would reduce total cost to homeowners and make clear the benefit of investing in loss reduction measures.

The public sector can affect mitigation by creating and enforcing building codes and land use regulations. Governmental bodies can limit post-disaster assistance practices that perversely reward those who choose not to mitigate and who ignore insurance options.

Challenges emerged in the presentations and subsequent discussions. There was general agreement that current insurance regulation is not conducive to creating private sector incentives. Rate restrictions and artificial pooling of risks have created a situation where insurance premiums do not reflect the actuarial risk. As a result, insurers have little incentive to reduce prices or offer lower deductibles to those adopting mitigation. Several participants pointed out that these market distortions are poorly understood and called for further research to illuminate this important element of the public policy debate.

Insurance, Reinsurance, and Capital Market Instruments: A close look at the insurance and reinsurance industry reveals that its capacity to bear large catastrophic losses may be substantially less than aggregate figures suggest. Market and industry structure limits the extent to which reserves might be available to cover a specific mega-disaster. Furthermore, premium-derived capital reserves are currently limited by tax regulation. Reinsurance, while permitting pooling over a wide enough geographic area to create greater statistical independence of low-probability, high-severity events, inevitably carries with it incentive conflicts between primary and secondary insurers which result in increased auditing costs. These additional costs must eventually be borne by the consumer. In addition, the price of reinsurance is cyclical and volatile, making it difficult for insurers to consistently obtain coverage when they need it.

Researchers and practitioners are currently exploring how to bring into play large diversified pools of capital that might efficiently complement traditional insurance and reinsurance risk transfer mechanisms for catastrophic risk. The U.S. securities market is so large ($15-20 trillion) that capacity relative to natural disaster losses is not an issue. Therefore it is not surprising that using capital market instruments such as bonds to provide protection against losses from hurricanes and earthquakes is now beginning to take place. Inclusion of such securities in diversified portfolios can enhance portfolio efficiency because of attractive pricing and their lack of correlation with conventional asset classes. However, before such financial instruments can become an effective complement to insurance and reinsurance, they must be able to resolve the incentive conflicts between the primary and ultimate risk bearers. Emerging modeling technologies and objective indices will reduce information asymmetries between parties and facilitate this process. Several participants envision substantial progress towards a fully functioning market over the next five years.

The Need for Public Private Partnerships: Current regulation allows property owners in hazard-prone areas to transfer a significant part of their catastrophic losses to the general taxpayer. Insurance regulation may give rise to cross subsidies and thereby impede insurers' attempts to efficiently diversify their risk. Furthermore, public expectations of federal low-cost reconstruction loans for the uninsured, along with a history of subsequent forgiveness, have discouraged mitigation efforts and diminished the perceived need for insurance among property owners. Some speakers asserted outright that private market mechanisms have fared rather poorly in this area

The recent emergence of state catastrophe funds, such as the California Earthquake Authority and the Florida Hurricane Catastrophe Fund, has led to debate about their financial effectiveness and the need for them. A dominant theme throughout the forum was the need for new public policy to support market-driven behavior, such as immediate action by states to permit the use of sound actuarial estimates of catastrophe risk in the insurance rate setting process. At the same time, participants recognized that government has an important continuing role in ensuring that special financial consideration is given to the truly disadvantaged. Finally, it was also noted that for the very highest layers of catastrophe risk, the government (and consequently the taxpayer) is now, by default, the insurer of last resort.

Forum Themes: Several overarching themes emerged during the forum.

1. What is the role of science and modeling in informing hazard policy? What standards are needed to properly evaluate models? Because efficient markets require equal access to information, there is a strong need for unbiased science and sound modeling. Models are also needed for assessing the benefits and costs of various mitigation strategies.

2. How can the framework of funding sources available for catastrophe insurance be expanded and refined to cope with a potential megadisaster?

3. Can rate regulation of insurance be justified? What regulations are needed to ensure solvency?

4. Public-private partnerships should not be a gift to the private sector; such partnerships can only prosper when all parties share in the benefits and the risks. What are the best ways to ensure that benefits and risks are distributed equitably?

5. There is an ongoing need for grassroots education to make the reduction of losses from natural disasters a public value. How can governments and the private sector best work together to develop the needed awareness among the public, the real estate and construction industries, and other significant audiences?

Appendix 1: List of Forum Speakers

James Ament (Assistant Vice President, State Farm Fire and Casualty Co.)
J. David Cummins (Executive Director, S. S. Huebner Foundation)
Neil Doherty (Professor of Risk Management and Insurance, The Wharton School of the University of Pennsylvania)
Steven Goldberg (Chief Actuary, USAA Property and Casualty Insurance Group)
Yacov Y. Haimes (Quarles Professor of Engineering and Applied Science, University of Virginia)
William H. Hooke (Chair, SNDR, U.S. Department of Commerce)
J. Robert Hunter (Director of Insurance, Consumer Federation of America)
Robert Irvan (Senior Vice President - CFO, CIGNA)
Edward B. Jobe (Chairman Emeritus, American Reinsurance Company)
Robert Klein (Center for Risk Management and Insurance Research, Georgia State University)
Paul Kleindorfer (Co-Director, Wharton Risk Management and Decision Processes Center)
Howard Kunreuther (Cecilia Yen Koo Prof. of Decision Sciences and Public Policy, The Wharton School of the University of Pennsylvania)
Christopher Lewis (Senior Consultant, Ernst & Young LLP)
Robert Litan (Director, Economic Studies Program, The Brookings Institution)
Robert Litzenberger (Director of Derivatives Research & Quantitative Modeling, Goldman Sachs & Company)
Franklin W. Nutter (President, Reinsurance Association of America)
Harvey G. Ryland (President & Chief Executive Officer, Institute for Business & Home Safety)
Anthony M. Santomero (Director, Wharton Financial Institutions Center)
Ellen Seidman (Director, Office of Thrift Supervision)
Craig Wingo (Deputy Associate Director for Mitigation, Federal Emergency Management Agency)
Richard Zeckhauser (Professor, Kennedy School of Government)

Appendix 2: List of Forum Participants

James Ament (Assistant Vice President, State Farm Fire and Casualty Co.)
William A. Anderson (Senior Advisor, Hazard Reduction Systems, National Science Foundation)
William J. Ashley (Executive Vice President, E.W. Blanch Co.)
Buzz Baldwin (Director, Catastrophe Risk Management, The Hartford)
Debra T. Ballen (Senior Vice President, Policy Development & Research, American Insurance Association)
Kevin Benson (Associate, Insurance Capital Markers Group, Morgan Stanley & Co.)
Peter P. Burns (Managing Director, Wharton Financial Institution Center, The Wharton School of the University of Pennsylvania)
Derek Chapin (Program Examiner, Office of Management and Budget)
Robert E. Chapman (Economist, Office of Applied Economics, National Institute of Standards and Technology)
Jordan Clark (President, United Homeowners Association)
Karen M. Clark (President, Applied Insurance Research Inc.)
Tim Cohn (Hydrologist, U.S. Geological Survey)
Dennis R. Connolly (Senior Vice President, J&H Marsh & McLennan)
Gloria C. Craven (Assistant Vice President, National Programs, USAA Insurance Company)
J. David Cummins (Executive Director, S. S. Huebner Foundation)
Ross Davidson (Vice President, USAA Property and Casualty Insurance Group)
Kenneth A. Deutsch (Senior Mitigation Associate, American Red Cross)
Neil Doherty (Professor of Risk Management and Insurance, The Wharton School of the University of Pennsylvania)
Larry W. Dye (Senate Budget Committee)
Diane Earl (Business and Industry Coordinator, Federal Emergency Management Agency)
Dennis D. Fasking (Senior Actuary, Allstate Insurance Company)
Donna B. Franklin (National Weather Service)
Matthew M. Gentile (Institute for Business & Home Safety)
James C. Giracca (Director, Complex Loss Issues, Liberty Mutual Group)
Kathleen K. Gohn (Public Affairs Specialist, U.S. Geological Survey)

Steven Goldberg (Chief Actuary, USAA Property and Casualty Insurance Group)
Joseph H. Golden (Senior Meteorologist, National Oceanic & Atmospheric Administration)
Edward M. Gross (Local Representative, International Association of Broadcast Meteorologists)
Patricia Grossi (Doctoral Candidate, University of Pennsylvania)
Anju Gupta (Post Doctoral Research Associate, Stanford University)
Yacov Y. Haimes (Quarles Professor of Engineering and Applied Science, University of Virginia)
Robert M. Hamilton (Vice Chair, SNDR, U.S. Geological Survey)
John R. Harrald (Director, Institute for Crisis, Disaster and Risk Management, The George Washington University)
Dottie M. Harris (Special Assistant to the Superintendent, New York State Insurance Department)
Walter Hays (Research Applications, U.S. Geological Survey)
Carl G. Hedde (Vice President, American Reinsurance Company)
G. William Hoagland (Majority Staff Director, Senate Budget Committee)
Arthur Hogan (Office of Thrift Supervision)
William H. Hooke (Chair, SNDR, U.S. Department of Commerce)
Erica Hubertz (Policy Analyst, Office of Sustainable Development, National Oceanic & Atmospheric Administration)
Lucy Huffman (Senior Economist, Department of the Treasury)
J. Robert Hunter (Director of Insurance, Consumer Federation of America)
Robert Irvan (Senior Vice President - CFO, CIGNA)
James R. Jancaitis (Senior Program Advisor, Research & Development, U.S. Geological Survey)
David S. Jansen (Legislative Specialist, National Oceanic & Atmospheric Administration)
Edward B. Jobe (Chairman Emeritus, American Reinsurance Company)
Randy Johnson (Global Program Manager, IBM Global Services, Leadership Coalition for Global Business Protection)
John Kelmelis (Chief Scientist for Geographic Research, U.S. Geological Survey)
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Katherine Boxer Latipow (Executive Director, California Utilities Emergency Association)
Andrei Latsenia (Environmental Emergencies Specialist, The World Bank)
Richard E. Lawhun (Manager, Technical Activities, American Society of Civil Engineers)
P. Patrick Leahy (Chief Geologist, U.S. Geological Survey)
Steve Levy (Manager, The Wharton School of the University of Pennsylvania)
Christopher Lewis (Senior Consultant, Ernst & Young LLP)
Joanne Linnerooth-Bayer (Leader, Risk Modeling and Policy Project, International Institute of Applied Systems Analysis)
Robert Litan (Director, Economic Studies Program, The Brookings Institution)
Robert Litzenberger (Director of Derivatives Research & Quantitative Modeling, Goldman Sachs & Company)
Greta M. Ljung (Vice President, Statistical Services, Institute for Business & Home Safety)
Jonna M. Long (Federal Emergency Management Agency)
Ronald D. McNeil (Senior Vice President, Personal Lines Property, Allstate Insurance Company)
Charles Meade (Senior Staff Officer, Board on Natural Disasters, National Research Council)
Thomas O. Mottl (Principal, Stratec Consulting)
Franklin W. Nutter (President, Reinsurance Association of America)
Elaine R. Padovani (Environment Division, Office of Science and Technology Policy)
Marcus Peacock (Professional Staff Member, House Water Resources & Environment Subcommittee)
Maria K. Poppas (Technical Analyst, California Seismic Safety Commission)
David Rafferty (Natural Disasters Working Group, Congressional Budget Office)
Noel J. Raufaste (Head, Cooperative Research Programs, National Institute of Standards and Technology)

Alan B. Rhinesmith (Deputy Associate Director for Housing, Treasury, and Finance, Office of Management and Budget)
Harvey G. Ryland (President & Chief Executive Officer, Institute for Business & Home Safety)
Anthony M. Santomero (Director, Wharton Financial Institutions Center)
George F. Segelken (Assistant Vice President, Ceded Reinsurance and Catastrophe Management, CIGNA Property and Casualty Company)
Ellen Seidman (Director, Office of Thrift Supervision)
Brian Smith (Director of Research, America's Community Bankers)
Allison Sondak (Research Assistant, Heinz Center for Science, Economics and the Environment)
Kenneth R. Stroech (Deputy Emergency Coordinator, U.S. Environmental Protection Agency)
John F. Sutter (Project Manager, USGS/CESIR)
Kathleen Tierney (Co-Director, Disaster Research Center, University of Delaware)
E. Lee Tilton (DCI Environmental Center/GDIN)
Lisa F. Tourville (Vice President, E. W. Blanch Co.)
David L. Unnewehr (Senior Research Manager, American Insurance Association)
Randall G. Updike (Chief Scientist, Central Region Geologic Hazards Team
U.S. Geological Survey)
Nathalie J. Valette-Silver (Executive Secretary of SNDR, National Oceanic & Atmospheric Administration)
Terry van Gilder (Director, Risk Management Solutions)
Brian J. Varricchione (Institute for Business & Home Safety)
Tamera R. Velasquez (Public Affairs Counsel, Alliance of American Insurers)
David Verardo (Congressional Science Fellow, Office of Senator Ron Wyden)
Louis S. Walter (Acting Program Manager, Solid Earth and Natural Hazards, National Aeronautics & Space Administration)
Jack Weber (President, Home Insurance Federation of America)
Herbert L. White (Public Safety Meteorologist, National Weather Service-W/OMII)
Marsha Tanner Wilson (Director, Public Affairs Practice, Leadership Coalition for Global Business Protection)
Craig Wingo (Deputy Associate Director for Mitigation, Federal Emergency Management Agency)
Richard Zeckhauser (Professor, Kennedy School of Government)
Arthur Zeizel (Policy Manager, Federal Emergency Management Agency)