

# Risk Management REVIEW

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## The “Irrational Economist” Conference Welcomes 100 Leading Scholars and Experts

On December 4 and 5, 2008, one hundred leading scholars in the fields of decision sciences, economics of information, political economy, catastrophic risk management and insurance gathered for a special conference at the Wharton School, University of Pennsylvania.

“The Irrational Economist” conference was convened to recognize the numerous contributions made by **Howard Kunreuther**, Wharton professor of decision sciences and public policy, during nearly four decades of research, and honor Kunreuther on the occasion of his 70th birthday.

Moreover, the conference brought together leading scholars to exchange ideas and cross multiple perspectives on some of today’s most pressing issues. The gathering also laid the groundwork for future multidisciplinary research over

the next decade.

Conference panelists and participants examined insights from the theoretical and empirical literature on decision sciences, history, economics and finance, risk management, and insurance. They reported on some of their most recent findings, and drew implications from this work that will help define policy decisions in the management of global risks such as natural hazards, climate change, technological hazards, terrorism and national security. Also on the discussion agenda — sustainable development and education. Participants used the event as a natural venue to reflect ways to make a difference toward positive societal changes.

The two-day conference was structured around six panels, each focusing on a complementary theme. Nearly thirty acclaimed ex-

perts and innovators, including several Nobel Laureates, played the role of “catalysts,” making short presentations that were followed by discussion with the conference



*Howard Kunreuther and co-panelists discuss ways to encourage people to think about risk. Society, businesses and individuals need to move away from the “it won’t happen to me” mentality in dealing with financial risks, technological hazards and natural disasters.*

## Irrational Economist

(Continued from page 1)  
participants.

In table discussions, conference attendees addressed the question: “As economists and social scientists, what do you think is one of the most understudied questions our research community should devote more time and energy to in the coming decade?” Responses included: “How does plasticity of human behavior influence social evolution?” “What are the causes of and cures of nationalism?” “How do we balance the need for regulation versus the rights of the individual?” and “What is the impact of irreversibility on decision making?”

One highlight of the conference was a video address to Howard Kunreuther by Nobel Laureate **Daniel Kahneman**, whose relationship with Kunreuther goes back thirty-five years. Kahneman’s advice to policy makers: Make sure that the environment is conducive to rational action by arranging the world so that people will end up doing the right thing. His advice to Kunreuther: “Just keep going just like that. Don’t change for the next thirty-five years.”

The conference was organized by **Erwann Michel-Kerjan** (Wharton) and **Paul Slovic** (University of Oregon), with financial support from the **Wharton School Office of the Dean**, the **University of Pennsylvania Office of the Provost**, the **Operations and Information Management Department at Wharton**, and the **Wharton Risk Management and Decision Processes Center**.

Audio files of the panels and discussion sessions, as well as conference papers, are available on the Irrational Economist conference website <http://www.theirrationaleconomist.com>.

More coverage of the event can be found at [Knowledge@Wharton](mailto:Knowledge@Wharton).



**Facing page:**

**Howard Kunreuther, Gail Loeb Kunreuther and Christian Schade (Humboldt-University, Berlin)** enjoy one of many light moments. The conference was organized in honor of Kunreuther on his 70th birthday.

**Paul Kleindorfer (INSEAD)**, a panelist on “*Decision Making Under Risk*” here joins discussion on what drives demand for insurance. From left: **Ulku Oktem (Wharton) and Dwight Jaffee (UC Berkeley)**. Jaffee, a panelist on “*Managing and Financing Extreme Events: Roles and Responsibilities of the Public and Private Sectors*” presented “*Catastrophe Insurance and Regulatory Reform After the Subprime Mortgage Crisis*.”

Nobel Laureate **Thomas Schelling** gives examples of how superstition and irrational beliefs about numbers can influence decisions about insurance purchasing. Co-panelists are **Richard Zeckhauser (Harvard), Ken Froot (Harvard), Mark Pauly (Wharton), and Erwann Michel-Kerjan (Wharton)**.

**Below:**

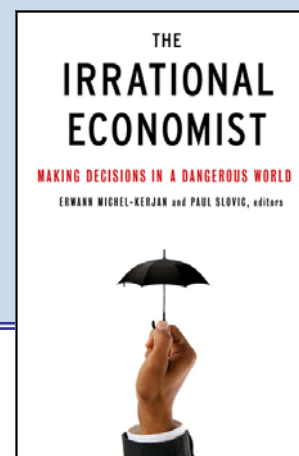
Conference organizers **Erwann Michel-Kerjan and Paul Slovic (University of Oregon)** on the final panel, “*Where do we go from here: Future Directions in Behavioral Economics and Risk Management*.” The conference was a culmination of their year-long organizing efforts.

*Panelists and Contributors*

Erwann Michel-Kerjan (Wharton) and Paul Slovic (University of Oregon), co-editors

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Kenneth Arrow (Stanford)  
 Colin Camerer (Caltech)  
 Avinash Dixit (Princeton)  
 Neil Doherty (Wharton)  
 Baruch Fischhoff (Carnegie Mellon)  
 Kenneth Froot (Harvard)  
 Christian Gollier (Toulouse University)  
 Geoffrey Heal (Columbia)  
 Robin Hogarth (Pompeu Fabra)  
 Dwight Jaffee (UC Berkeley)  
 Daniel Kahneman (Princeton)  
 Ralph Keeney (Duke)  
 Paul Kleindorfer (INSEAD)  
 Carolyn Kousky (Resources for the Future)  
 David Krantz (Columbia)  
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 David Moss (Harvard)  
 Robert O'Connor (National Science Foundation)  
 Ayse Öncüler (ESSEC)  
 Mark V. Pauly (Wharton)  
 John W. Pratt (Harvard)  
 Thomas Schelling (University of Maryland)  
 Paul Schoemaker (Decision Strategies International)  
 Joseph Stiglitz (Columbia)  
 Cass Sunstein (Harvard)  
 Kip Viscusi (Vanderbilt)  
 Richard Zeckhauser (Harvard)



Essays by “Irrational Economist” conference panelists will be published by **Public Affairs Press**, January 2010 in a book titled, ***The Irrational Economist: Making Decisions in a Dangerous World***. **Public Affairs** is part of Perseus Books Group, which was named “Publisher of the Year” in 2007 by *Publishers Weekly*.

## Rare Events, Prediction Markets, and Pari-mutuel Markets

by Robert Meyer, Co-Director, Wharton Risk Center

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Perhaps the greatest source of frustration that exists in managing the risk of low-probability, high-consequence hazards is that mathematical probabilities for rare events are almost always difficult to specify with precision. As a result, traditional textbook principles for setting insurance rates based on statistical risk offer limited practical guidance. The consequence is well-known: in the case of insurance, for example, market prices for catastrophe coverage often vacillate over time as a function of prevailing subjective beliefs about risk. The textbook example of this is terrorism insurance, which swung from almost costless in the days before the September 11, 2001 attacks to unobtainable in the days afterward—though few would argue that there was much of a change in statistical risk. But even in domains such as hurricane landfalls there will often be ambiguity about the likelihood of truly extreme events. While return periods for tropical cyclone landfalls are reasonably well documented,

we do not have a good handle on probabilities for the kind of extreme, bank-breaking events that keep state insurance commissioners awake at night.

What worries Florida, for example, is not the damage that might be caused by the Category 1 and 2 storm that drives tourists off the beaches each summer, but rather a Katrina-sized Category 4 hurricane sweeping up the west side of

Tampa Bay—and event that could easily produce \$150 billion or more in losses. How likely is such an event? The reality is that no one knows for sure. Because there are no historical records of hurricanes of extreme intensity following that feared track, we presume the odds are low, but just how low is anyone's guess (including those generated by simulation models). On the other hand, there is always the fear that the odds may be higher than anyone presumes because of the Black Swan effect: the possibility that damage of that magnitude being caused by a combination of factors not considered in risk models (as we saw in Katrina).

It is against this background that it has recently been suggested that if there is a single best method for quantifying risk in the domain of the seeming unknown, it lies latent in

***If there is a single best method for quantifying risk in the domain of the seeming unknown, it lies in the aggregate predictions of large pools of individuals who have “skin in the game.”***

prediction markets—the aggregate predictions of large pools of individuals who have “skin in the game” of predicting the outcome of an uncertain event. The idea that aggregate betting is often a good predictor of outcomes is, of course, hardly new; favorites at the track tend to win more often than they lose, as favored NFL teams. Where the academic study of prediction becomes controversial, however, is

with the suggestion that the pattern of aggregate bets could be a reliable guide to assessing to predicting the likelihood of rare events that few have ever experienced. The rationale is simple, and goes something like this: when it comes to catastrophic events, the core problem faced

***When catastrophes occur that seemed unexpected (such as the 2008 financial meltdown), we soon discover that not everyone was caught by surprise.***

by those at risk is not that the odds are unavailable, but rather that no one knows whose odds to trust. When

insurance carriers set rates (or at least try to) for hurricane wind storm insurance, for example, they do so based on extremely narrow advice: typically a handful of modeling companies who generate odds using similar statistical methodologies (commonly simulating the paths and intensities of thousands of hurricanes). And until recently, investment banks assessed portfolios using Value-at-Risk measures computed, perhaps, by a single analyst. Yet, when catastrophes occur that seemed unexpected (such as the 2008 financial meltdown), we soon discover that *not everyone* was caught by surprise; the local engineers who foretold the failure of levees during Hurricane Katrina, the bearish stock analysts who predicted the collapse of the real estate bubble. The rationale of prediction markets is that they work because they pool all such knowledge, and provide a financial incentive for all participants to overturn whatever rock is available if it will allow them to predict a correct

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outcome—a process that, in the aggregate, yields the best unbiased forecast.

In a recent [Wharton Risk Center working paper](#) that I co-authored with colleagues from Cornell University and Weather Risk Solutions, we describe some empirical tests of one of the first commercially-available prediction markets for a class of catastrophic events: U.S. hurricane landfalls. The primary motivation for the product is to provide residents in hurricane-prone areas a means for protecting against losses from storms through a pari-mutuel investment pool outside of normal insurance coverage. Unlike a stock market, the HuRLO (**H**urricane **R**isk **L**andfall **O**ptions) market is *one-sided*, meaning that an investor who believes that a hurricane will make landfall in particular location (defined by counties) does not need to find a counter-party who currently holds that position and is willing to sell. Rather, prices are set via numerical algorithm that reflects current market demand. In our studies, the participants—Wharton students with limited personal experience with hurricanes—invested as different hypothetical hurricanes formed and approached land. Our interest was in observing how well naïve market prices predicted actual storm landfalls.

Did the HuRLO predictions foresee the future as well as expert forecasts? In our case the answer was “yes and no.” On one hand, the prices set by the market were not magically omniscient; when a

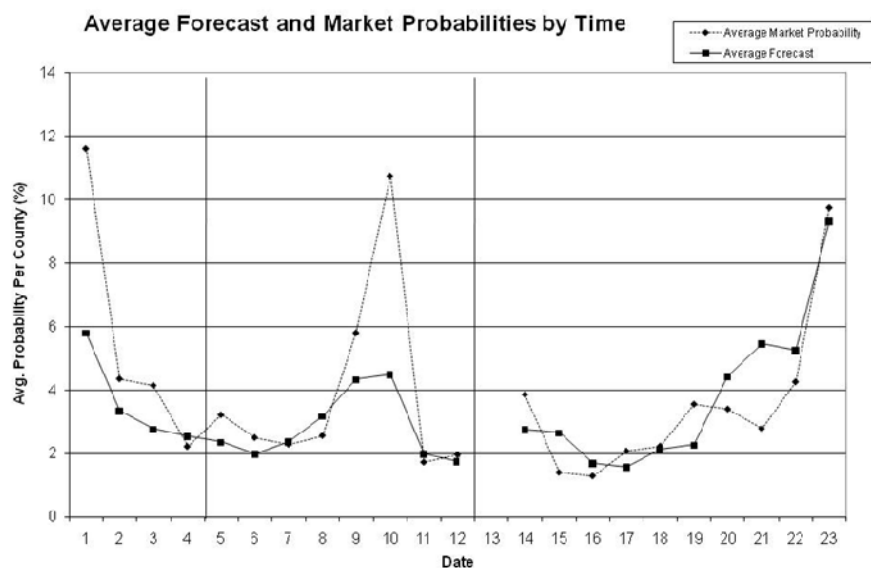
hurricane took an unexpected turn, the prices did not foresee it. Yet, on the other hand, prices *did* act as unbiased forecasts in that they closely tracked the underlying actuarial odds of landfalls that were pre-programmed into the simulation. In fall 2009 we hope to extend this work to the field using data from real traders facing real hurricane threats.

**Our interest was in observing how well naïve market prices predicted actual storm landfalls.**

While our work has been narrowly focused on a particular form of catastrophe prediction, our findings generally mirrored the good news/bad news findings from experiences with other prediction markets. On the one hand, those hoping that prediction markets might be a way of foreseeing the unseen will be disappointed; prediction markets, by definition, can do no better than reflect the

information that is available to the population of traders, and the inferences they make based on that information. On the other hand, prediction markets *can* be positively used to help offset what I see as one of the greatest weaknesses in modern methods of risk management: the tendency to calibrate risk either based on the narrow advice of a single source (e.g., a simulation estimate from a storm impact model) or a narrow pooling of the opinions of a familiar individuals (e.g., Delphi methods). Open prediction markets, in contrast, work because they are composed of a large population of traders who have an explicit incentive to find and utilize all available relevant information, much of which may come from quite uncommon sources.

The study is available at <http://opim.wharton.upenn.edu/risk/library/WP20081208HuRLO.pdf>.



**Plot of how volume-weighted Market Probabilities tracked changes in objective landfall probabilities over time. The figure shows a tendency to over-value options relative to the objective probabilities both at the start of the pre-season and given the first landfall threat, but on-average convergence to objective probabilities thereafter.**

## Next Phase of Extreme Events Project is Underway

With the publication of [\*At War with the Weather\*](#) (MIT Press, 2009), the Risk Center moves to a new phase of its multi-year study, *Managing and Financing Extreme Events*. Under the direction of Howard Kunreuther and Erwann Michel-Kerjan, the project team—Neil Doherty (Wharton), Scott Harrington (Wharton), Anastasia Kartasheva (Wharton), Robert Klein (Georgia State University), Robert Meyer (University of Florida), Greg Nini (Wharton), Mark Pauly (Wharton), and Jeremy Tobacman (Wharton)—has identified the next areas of study. The work is proceeding with the financial support and input of the Risk Center's corporate research sponsors.

### **Analysis of State Regulation and Rating Agencies**

Following recent failures of credit rating agencies to provide timely, accurate information (WorldCom, Enron, and the current subprime mortgage crisis), there has been concern with the significant concentration of power in a small number of rating agencies. Given the changing role of rating agencies as *de facto* regulators of the insurance industry we will undertake research on rating agency policies, standards and methods and their impact on insurers and insurance markets. To date there is no agreement about the impact of competition on the quality of information provided by rating agencies. The study aims to answer the following questions:

- Is it possible to define an optimal number of rating agencies?
- Would increasing the number of agencies affect the accuracy of rating provided by each agency?
- What effect would this likely have on the insurance industry?

### **Examining the Cost of Capital**

Providing catastrophe insurance coverage demands considerable capital and must be competitively priced to recoup the costs associated with this capital. Of course, the capital itself is invested and generates income, but there are transaction costs associated with capital. The optimal amount of capital involves a balance between the costs of distress and taxes. While the importance of capital to the financial security of insurers is widely recognized, the impact of capital on insurance prices is not appreciated by regulators. We therefore intend to conduct an empirical investigation of the costs associated with capital needed to support natural catastrophe insurance in the U.S. Our intention is not to delve into the effect of capital on pricing *per se*, but rather to illustrate the costs burden associated with capital such that it is weighted appropriately in public policy discussion.

### **Educating Policymakers on the Role of Insurance**

With several trillion dollars of insured value in U.S. coastal areas, the recent upsurge in hurricanes poses a threat to homeowners and businesses, and a challenge to our nation as to how best to reduce the risk from future disasters and to provide funds for recovery to victims. The publication of *At War with the Weather* promises to provide momentum for the Risk Center to continue to interact closely with policymakers at the state and federal levels as to the appropriate roles of insurance and new financial instruments in reducing losses from catastrophic risks, as well in providing financial protection after an event occurs. In briefing top decision-makers, our focus will be on guiding principles, including the need for risk-based premiums, issues of affordability, and minimizing the potential for insolvency.

### **Encouraging Adoption of Mitigation Measures against Natural Catastrophes**

Any long-term solution to the crisis of hazard risk management ultimately hinges on the willingness of homeowners and communities to reduce the potential losses through investments in mitigation. We know today which mitigation measures are cost-effective and why people living in high-risk areas are not willing to invest in these options. The impediments include residents having overly short planning horizons, being uninformed about the benefits of mitigation, and the absence of adequately-structured financial incentives. The study will explore how this knowledge can be used to design innovative approaches to risk communication and financing of cost-effective loss reduction measures.

## The Roles of Third Parties in Regard to the Integrity of Process Management Systems

by Isadore Rosenthal and Howard Kunreuther

Third party audits play a significant role in many business and regulatory programs aimed at reducing the number of incidents resulting in deaths and serious injuries to the public. Third parties also play important roles in business and regulatory programs that address risks associated with a wide variety of products and processes.

Wharton undertook a study of the safety functions and roles that third party audits play in four regulatory programs: boiler and pressure vessels; public company financial accounting statements; mechanical press safeguarding; and the safety of chemical processes.

The findings of the study led the authors to the following observations:

- In general, the regulatory programs in these four safety areas were not adequately funded by the government.
- The success of the third party audit mechanism in the boiler area was probably enhanced because the bulk of the boiler third party auditors leaned towards over-compliance as a result of their association with boiler insurance companies who had a self-interest in preventing facility boiler accidents losses.
- The various state boiler regulations were able to be successfully implemented in part, because they required regulated companies to pay a fee to cover the costs of regulating them. This is an important consideration given the difficulties regulatory agencies face in funding the required highly skilled food safety auditors.

The authors propose that the Food Safety and Inspection Service (FSIS) of the USDA consider use of a third party audit program that allows for:

- The use of FSIS-approved third party auditors whose bias, if any, might result in incompletely justified findings that a firm has not complied with one or more provisions of the FSIS regulation's requirements.
- Specified portions of the cost of the required third party audits to be borne by (1) the audited facility, and (2) the company that insures the facility for food illness and food recall losses, if the company has such insurance.

The study is available at [http://opim.wharton.upenn.edu/risk/library/WP20081216\\_ERS.pdf](http://opim.wharton.upenn.edu/risk/library/WP20081216_ERS.pdf). An updated version of the study will be published in *Improving Food Import Safety*, L. Zach, W. Ellefson, D. Sullivan (eds.), Institute of Food Technologists. For information, contact Isadore (Irv) Rosenthal at [rosentha@wharton.upenn.edu](mailto:rosentha@wharton.upenn.edu).

*This research has been supported by a grant from the U.S. Department of Agriculture's Economic Research Service (ERS) office ([www.ers.usda.gov](http://www.ers.usda.gov)). The authors acknowledge the contributions of **Peter J. Schmeidler** who started this project. He passed away on April 14, 2008.*

## Wharton Risk Center Engages in a Joint World Bank-U.N. Study: *Mitigating Natural Disasters in Low-Income Countries*

by Howard Kunreuther, Co-Director, Wharton Risk Center  
and Erwann Michel-Kerjan, Managing Director, Wharton Risk Center

Extreme events kill legions of people all over the world. In Southeast Asia, the tsunami in December 2004 killed more than 280,000 people residing in coastal areas. When Cyclone Nargis, which made landfall in Myanmar in May 2008, killed an estimated 140,000 people, it was the deadliest natural disaster in the recorded history of the country. The same month, the Great Sichuan Earthquake in China is estimated to have killed nearly 70,000 people. Five million others became homeless. Other estimates put this number as high as 11 million. These recent extreme events highlight the urgency of developing a coherent risk reduction and adaptation strategy to avoid future catastrophic human and economic losses in low- and middle-income countries.

Building on its work in developed countries, the Wharton Risk Center has recently engaged in a **World Bank-United Nations project** jointly with the **International Institute for Applied Systems Analysis (IIASA)** and **Risk Management Solutions (RMS)** to evaluate the benefits and costs of alternative measures for reducing losses from natural disasters in emerging economies. Funding for the project is being provided by the **Global Facility for Disaster Reduction and Recovery (GFDRR)**.

Phase I of the study, currently underway, focuses on damage to households in four regions facing different hazards. Phase II (Fall

2009-2010) will extend the analysis to communities (regions, countries) and consider alternative collective measures such as land use regulations, building codes, infrastructure protection and large-scale infrastructure projects such as construction of dams and levees. It will also study the role that risk financing solutions (e.g. insurance) can play in providing protection to victims of these disasters—a necessary condition to sustain the development of these regions—and give people and small businesses there enough incentive to invest in risk reduction measures as well.

### **Background Study:** **Ex Ante/ Ex Post Considerations for Reducing Vulnerability**

The current study builds on a report that the Wharton Risk Center recently completed for the project, *A Framework for Reducing Vulnerability to Natural Disasters: Ex Ante and Ex Post Considerations*, which is available as a working paper on the Wharton Risk Center's website. The report analyzes how to systematically link efforts undertaken prior to a disaster (*ex ante* measures include investment in cost-effective risk reduction measures and the purchase of financial protection such as insurance), with actions taken after a disaster has occurred (*ex post* measures include disaster assistance from government and international donors, insurance claims payments, recovery loans and

mitigation loans).

The report develops a normative model of protective decision making where individuals are assumed to have full information and make tradeoffs that satisfy a set of axioms characterizing rational choice. It then moves to a descriptive analysis to explain why many people do not necessarily purchase insurance even when it is attractively priced, or invest in cost-effective risk reduction measures only after a disaster occurs, when it is too late. The behavioral biases include budgeting heuristics, misperception of probability, affective forecasting errors, underweighting the future, myopic behavior, learning failures, social norms, and interdependencies.

*(Continued on page 9)*

### **Four regions and hazards of the study (Phase I)**

- **Jakarta (Southeast Asia)**  
Facing rising hazard from riverine flooding
- **St. Lucia (Caribbean)**  
Facing coastal flooding from hurricanes
- **Istanbul (Europe/Asia)**  
Facing damage from major earthquakes in the Sea of Marmara plate boundary
- **Uttar Pradesh, India (Southeast Asia)**  
Facing droughts and floods that threaten household property and crop yields



## Evaluating Attractiveness of Alternative Risk Reduction Measures

The relative attractiveness of alternative risk reduction measures (mitigation) can be determined in a systematic manner by the following five step process. We illustrate the procedure in the context of property, but it can be applied to any unit such as a building, infrastructure system and crop yields.

*(Continued from page 8)*

The study offers guidelines for improving individual decision making and public policy, including: (1) properly assessing risks and characterizing uncertainties surrounding these estimates; (2) understanding behavioral biases and heuristics utilized by decision makers such as those described above; and (3) designing risk management strategies based on risk assessments and the recognition of these behavioral biases and heuristics used by decision makers in deciding what protective measures they will undertake.

Since insurance is currently not widely available in many developing countries (and barely existent in very poor countries), the report focuses on other risk reducing mechanisms that could reduce future losses from disasters. These include assuring that proper building codes and land-use regulations are implemented in hazard-prone areas, coupled with mitigation grants to reduce both economic losses and fatalities/injuries from future natural disasters. The study also proposes long-term contracts such as loans for mitigation, and multi-year property insurance as a way to provide stability to residents and overcome behavioral biases such as myopia and misperceptions of risk.

For more information, see [http://opim.wharton.upenn.edu/risk/library/WP20081101\\_WBFramework.pdf](http://opim.wharton.upenn.edu/risk/library/WP20081101_WBFramework.pdf) or contact Howard Kunreuther at [Kunreuther@wharton.upenn.edu](mailto:Kunreuther@wharton.upenn.edu) and Erwann Michel-Kerjan at [EwannMK@wharton.upenn.edu](mailto:EwannMK@wharton.upenn.edu).

### **Step 1. Characterize the Nature of the Hazard and Risk**

Consider a residential structure in Istanbul that is subject to earthquake damage. Using data on the likelihood of earthquakes of different magnitudes and the resulting damage to the property and contents, one can construct a loss exceedance probability (EP) curve that characterizes the likelihood that the dollar loss will exceed a particular amount. One can also construct EP curves for other disaster impacts such as fatalities and injuries.

### **Step 2. Specify Alternative Mitigation Measures and their Costs**

For an individual structure in a hazard-prone area, there are likely to be several alternative mitigation measures for reducing losses from future disasters. Some of these measures could be taken by the property owner, while others would require collective action on behalf of the community. Consider a house in Jakarta that is subject to floods. One solution for the owner would be to build a protective wall and watertight gate to reduce the likelihood and consequences of flooding.

### **Step 3. Determine the Expected Discounted Benefits From Mitigation Measures**

This requires the construction of EP curves for the individual structure with and without a specific mitigation measure in place. Suppose that a house in St. Lucia had storm shutters installed to mitigate damage from future hurricanes and the house was expected to stand for 30 years. One would need to construct EP curves with and without mitigation in place for the each of the next 30 years and determined the expected benefits of storm shutters for each of these 30 years.

### **Step 4. Evaluate the Cost Effectiveness of Specific Mitigation Measures**

The cost-effectiveness of alternative measures can be ranked; those having the highest value are the most desirable. Financial ability of residents to invest in the measure is also a consideration. Consider a house in St. Lucia that is prone to flooding. Suppose that both flood-proofing the house or elevating it are cost-effective, but that elevating the house has a higher cost effectiveness than flood-proofing it. However, the cost of elevating the house is considerably more expensive than flood-proofing it. If the family has limited resources it may opt to flood-proof the house rather than elevate it.

### **Step 5. Undertake Sensitivity Analyses**

There is uncertainty with respect to estimating the expected damage from future disasters with and without mitigation, the costs of the measures and their expected discounted benefits over time. For this reason, it is important to undertake sensitivity analyses to gain some appreciation as to how the cost-effectiveness of specific measures is impacted by changes in these inputs.

## Global Agenda Council on Mitigation of Natural Disasters

The international community needs to examine the basic operating systems that drive its economies, markets and societies and aim for a “fundamental reboot” to establish a fresh platform based on renewed confidence and trust, and on sustainability, responsibility and ethical principles. That was the over-arching message that 700 of the world’s top thought leaders from business, government, academia and civil society delivered at the end of the inaugural **Summit on the Global Agenda**, convened in November 2008 in Dubai by the **World Economic Forum** in partnership with the Government of Dubai.

The Summit on the Global Agenda is a new, unique gathering of the world’s most influential thinkers—leaders from academia, business, government and society. Its purpose is to advance solutions to the most critical challenges facing humanity.

After three days of intense brainstorming on the most pressing global issues and risks, including how to shape the post-crisis international financial system, members of the sixty-eight Global Agenda Councils, who came to Dubai from over sixty countries, offered assessments of the state of the world in their focus areas and initial outlines of solutions

and approaches.

Risk Center co-director **Howard Kunreuther** serves as co-chair of the Global Agenda Council on “**Leadership and Innovation for Reducing Risks from Natural Disasters**” with **Michael Useem**, Director, Wharton Center for Leadership and Change Management. Risk Center managing director **Erwann Michel-Kerjan** also serves on this council. A summary of the findings of each Global Agenda Council is posted on the World Economic Forum’s website, at <http://www.weforum.org/globalagenda/reports>.

The work of the Councils, which continued to meet throughout the year, was taken forward to the Forum’s 2009 Annual Meeting, in Davos, Switzerland, in January 2009, “*Shaping the Post-Crisis World.*”

Kunreuther and Michel-Kerjan were among six faculty from the Wharton School who attended the Annual Meeting of the World Economic Forum in Davos. Kunreuther served on two panel discussions: *Update 2009: Controlling Climate Change*; and *The Global Agenda for 2009*. Michel-Kerjan served on four panels: *Can You Trust Your Model?*; *Global Solutions from the Past*; *Crisis, Collaboration and a Connected World*; and *Global Challenges: Group Genius Required?*

**Members of the WEF’s Global Agenda Council on Mitigation of Natural Disasters meet in Dubai, November, 2008.**

*From left:*

**Michel Jarraud (Secretary-General, World Meteorological Organization); Howard Kunreuther, co-chair (Wharton); Erwann Michel-Kerjan, (Wharton); Herman “Dutch” Leonard (Harvard University); Sean Cleary, (Strategic Concepts).**



*Council members not pictured:*

**Arnold Howitt (Harvard University); Bridget Hutter (London School of Economics and Political Science); Herminia Ibarra (INSEAD); Thomas Lovejoy (Heinz Center for Science, Economics and the Environment); Markku Niskala (Secretary-General, International Federation of Red Cross and Red Crescent Societies); Kristine Pearson (Freeplay Foundation); Michael Useem, co-chair (Wharton School); Detlof von Winterfeldt (IIASA); Lan Xue (Tsinghua University); Richard Zeckhauser (Harvard University).**

## World Economic Forum Global Risks Report 2009

The World Economic Forum has released its report on *Global Risks 2009*. The report identifies deteriorating fiscal positions, gaps in global governance and issues relating to natural resources and climate as the pivotal risks facing the world this year.

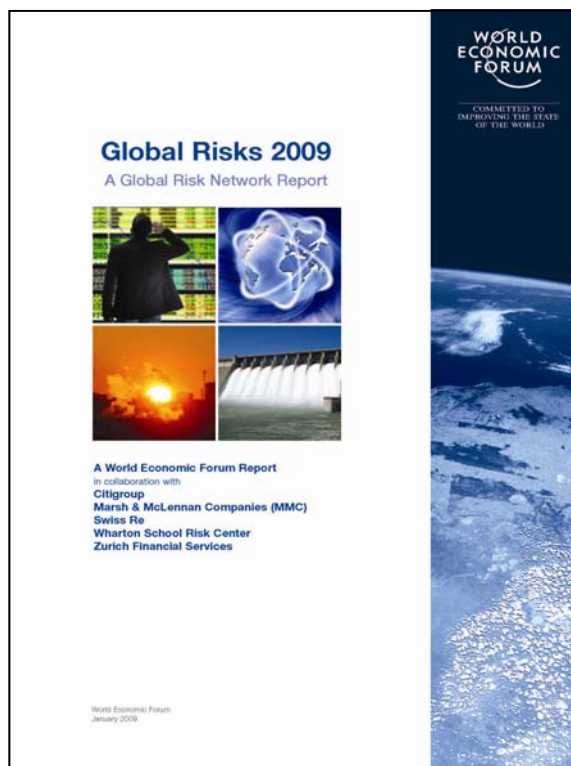
The Wharton Risk Management Center provided research and editorial content for the WEF publication. The Wharton Risk Center has been the academic partner of the WEF's Global Risks Network Initiative since 2005. Other partners include **Citigroup, Marsh & McLennan Companies, Swiss Re, and Zurich Financial Services**. The partners convened regularly throughout the year, as well as via twice-monthly conference calls, to share information and establish the content of the report.

**Sheana Tambourgi**, Director and Head of the Global Risk Network at the World Economic Forum, said: "*Global Risks 2009* builds on the work of previous years and highlights the need for concerted action to mitigate risks that now more than ever are global in their nature and in their impact, as illustrated by the financial crisis. But the same is true for other risk areas; global risks require a multistakeholder response and cannot be appropriately tackled in isolation."

The 2009 report predicts that massive government spending to support financial institutions is threatening the already precarious fiscal positions in countries such as the U.S., United Kingdom, France, Italy, Spain, Australia and China. It is dangerous to address immediate concerns without remedying the root causes of the problem, or sowing the seeds of new ones whose impact will not be immediate but may be strongly felt at a later date.

The financial crisis has exposed the lack of coordination among policy-makers, regulators and supervisors. The report acknowledges the need for better governance globally but warns against a knee-jerk over-reaction which would increase transaction and compliance costs and ultimately prove ineffective in the face of the next crisis.

In addition to the immediate risks stemming from the financial crisis, the report cautions against ignoring interconnected risks related to natural resources.



It also warns of potential rising tensions between developed and developing countries with respect to climate change policy.

The Global Risks partners believe that 2009 may prove to be an opportune moment to strengthen global governance and build the political will to restore global financial stability, and focus on the longer term challenges of managing scarce resources and climate change.

As summarized by Howard Kunreuther, Co-Chair of the Forum's Global Agenda Council on Mitigation of Natural Disasters: "If business leaders and decision-makers can overcome the behavioral biases towards immediate, short-term solutions and switch to longer-term thinking, then they will have made significant progress in adopting an attitude suited to the mitigation of increasingly complex and interlinked global risks."

The report is available on the Center's website at [http://opim.wharton.upenn.edu/risk/downloads/WEF\\_Global\\_Risks\\_2009.pdf](http://opim.wharton.upenn.edu/risk/downloads/WEF_Global_Risks_2009.pdf).

## Chertoff Discusses Risk and Role of Government Risk Center Brings DHS Secretary Michael Chertoff to Wharton

By Zach Schapira

Our economy is in crisis mode. We're over-leveraged. We're undercapitalized. We've ushered in a new era of total deregulation. None of it has worked, and since we realized, we have pumped nearly a trillion rescue dollars into the financial system.

According to **U.S. Homeland Security Secretary Michael Chertoff**, the present financial crisis is following the same mold as two other recent disasters—September 11th and Hurricane Katrina. Despite all of the predictions, we prepared inadequately.

"With the passage of time, as the original event becomes a matter of memory, we begin to decide that we're spending too much money trying to avert the risk," said Chertoff. "And we begin to degrade our preparation once again." To Chertoff, that's "the sign of an inefficient system for managing risk."

On October 16, 2008, Chertoff talked with more than 300 Wharton students and faculty in Jon M. Huntsman Hall about "When We Fail to Manage Risk." The event was sponsored by the Wharton Risk Management and Decision Processes Center, under the direction of Wharton Professor Howard Kunreuther.

Chertoff looked at our failures to avert risk in the examples of three recent national disasters:

September 11th, Hurricane Katrina, and the current financial crisis. Each time a disaster has occurred, we've responded in a big way. But each time, we've responded with more effort and expense than would have been necessary had we prepared adequately.

According to Chertoff, we're living "in the middle of financial woes that have been to some degree predicted over a number of years, going back into the 1990s — in terms of over-leverage, too much credit, too little equity, [and] home values that are on the tip of a bubble." He says the problem is not that we "failed to anticipate the one-time risk. It's that we don't learn the lesson."

In order to address risk we have to prevent and reduce our vulnerability to disasters, as well as mitigate their consequences by strengthening our preparedness and response. The most important lesson we can draw from

***The problem is not that we "failed to anticipate the one-time risk. It's that we don't learn the lesson."***

these experiences is to focus on the need for strategic, sensible risk management through careful government intervention.

While individuals and businesses are still the foundation of a free society and the "fundamental engine of risk management," even "the most ardent capitalist" would agree that the government has a role in making it possible for a free market to function. Chertoff proposes that there are three



*The Wharton Risk Center hosted U.S. Department of Homeland Security Secretary Michael Chertoff on October 16, 2008. Speaking to an audience of over 300, Secretary Chertoff emphasized the role of government in working with the private sector to address risks in the future. The transcript and video of the talk are available at <http://opim.wharton.upenn.edu/risk/DHS.htm>.*

basic areas where individual risk management seems to fail, and where the government therefore has a responsibility to intervene: time horizons, externalities, and transaction costs.

Chertoff contends that the free market overemphasizes short-term benefits and underemphasizes long-term costs. It promotes the attitude that the individual should benefit today, and not worry about possible costs tomorrow. One example of this is the reluctance of people to elevate their homes in flood-prone areas. In order to help society manage risk properly, it is the government's responsibility to create and enforce building codes.

*(Continued on page 13)*

(Continued from page 12)

The second problem for individual risk management is the tendency to internalize costs to the individual but underestimate costs to society. For example, a factory dumping into a stream may not internalize the costs to everyone downstream. In such situations involving negative externalities, it is the government's responsibility to create and enforce dumping regulations.

The third and final problem that the free market cannot solve on its own is the problem of transaction costs. When investors put money into a stock, they trust that it's safe. In order to prevent individuals from having to validate information on their own, the government creates and enforces rules about transparency.

"If the disasters and the problems that we've encountered over the last eight years teach us nothing else, it is not only 'shame on the disaster maker' — whether it be mother nature or man— for the first disaster that we don't properly manage, but also shame on us for failing to manage the risk for the second disaster," Chertoff concluded. "[We must] have the commitment of responsible actors in the government and in the private sector to make sure that we do truly achieve a partnership in managing our risk."

Reprinted from the website of the Wharton School  
[http://www.wharton.upenn.edu/whartonfacts/news\\_and\\_events/features/2008/f\\_2008\\_10\\_816.html](http://www.wharton.upenn.edu/whartonfacts/news_and_events/features/2008/f_2008_10_816.html)

The Wharton Risk Center has worked closely with Department of Homeland Security over the last year. Secretary Chertoff and Risk Center co-director Howard Kunreuther met in 2008 while serving together on a World Economic Forum panel on bioterrorism. Since then, DHS and Wharton have collaborated frequently on loss-reduction measures for natural disasters and terrorism.

Following his address, Secretary Chertoff met with Risk Center faculty and associates and DHS policy staff to discuss future research that the Wharton Risk Center may conduct with DHS related to insurance and consumers' myopic decision making.

## Risk Regulation Seminar Series

The Risk Center welcomed some of the nation's leading scholars and policy makers as part of its continuing Risk Regulation Seminar Series. Speakers for the Fall 2008-Spring 2009 series include:

**Lisa Robinson**, Harvard Center for Risk Analysis, "[Should Different Regulatory Agencies Use Different Values of Statistical Lives?](#)"

**Dwight Jaffee**, Willis Booth Professor of Banking, Finance, and Real Estate; Haas School of Business, University of California, Berkeley, "[Re-Regulating the Financial Markets In View of the Government Bailouts](#)"

**Thomas O. McGarity**, Joe R. and Teresa Lozano Long Endowed Chair in Administrative Law, University of Texas at Austin School of Law, "[The Preemption War: When Federal Bureaucracies Trump Local Juries](#)"

**Thomas Burke**, Associate Dean for Public Health Practice and Training, Johns Hopkins Bloomberg School of Public Health, "[New Directions for Risk Assessment in the Incoming Administration and Beyond](#)"

**Thomas E. Lovejoy**, President, H. John Heinz III Center for Science, Economics, and the Environment, "[Climate Change, Nature, and Action](#)"

**David Moss**, John G. McLean Professor of Business Administration, Harvard Business School, "Rethinking Regulation in the Wake of the Financial Crisis"

**Molly Macauley**, Senior Fellow and Director of Academic Programs, Resources for the Future, "Perceived Risk of Manned Space Flight"

The Risk Regulation Seminar Series is jointly sponsored by the Penn Program on Regulation; the Program on Law, the Environment and the Economy; the Wharton Risk Management and Decision Processes Center; the Institute for Global Environmental Leadership; and the Fels Institute of Government. Information on upcoming seminars can be found at <https://www.law.upenn.edu/academics/institutes/regulation/seminars.html>.

## WHARTON RISK CENTER FACULTY *IN THE NEWS*

March 10, 2009, **The Economist**

Research co-authored by Maurice Schweitzer is mentioned in the article, "Shooting at Goals."

February 18, 2009, **Knowledge@Wharton**

Coverage from the December 2008 "The Irrational Economist" conference at Wharton.

January 29, 2009, **Xinhua News Agency (China)**

Howard Kunreuther, speaking from Davos at the World Economic Forum, cites the need for adaptations in construction of buildings to protect against natural disasters.

January 27, 2009, **Forbes**

Wharton Dean Tom Robertson discusses the World Economic Forum's annual meeting in Davos and the Risk Center's role in the World Economic Forum's *Global Risks Report 2009*.

January 4, 2009, **Congressional Quarterly**

Cary Coglianese notes Obama's political appointees do not have to undo the Bush regulatory framework to achieve their policy objectives.

December 16, 2008, **The Philadelphia Inquirer**

Op-ed by Howard Kunreuther and Michael Useem, "Anticipating risks, averting the worst."

December 11, 2008, **BBC World Service**

Erwann Michel-Kerjan is interviewed for World Service international broadcast.

December 9, 2008, **The Philadelphia Inquirer**

Cary Coglianese discusses an EPA program which fails to demonstrate environmental improvements.

December 5, 2008, **Economic Times of India**

Maurice Schweitzer is interviewed about his research on how emotions influence people's receptiveness to advice.

October 29, 2008, **Newsday**

Eric Bradlow comments on the New York Jets' personal seat license auction strategy.

October 24, 2008, **KYW News radio (Philadelphia)**

Eric Orts is interviewed regarding how the next president will enhance environmental regulations.

October 9, 2008, **Wall Street Journal**

Scott Rick is quoted in regard to his research on "tightwads and spendthrifts."

September 16, 2008, **Penton Insight**

Research by Neil Doherty is noted in an article regarding life settlement opportunities.

September 10, 2008, **NPR, "Morning Edition"**

Mark Pauly is interviewed regarding new treatments tailored to patients' genetic make-up.

August 14, 2008, **Boston Globe**

Robert Meyer is quoted in an article about the ways that retailers are improving customer service.

August 14, 2008, **Forbes.com,**

Erwann Michel-Kerjan is quoted in an article concerning the cost of homeowners' insurance in hurricane-prone regions.

July 21, 2008, **The New York Times**

Mark Pauly is quoted in an article about the impact of pilot projects in "medical home" patient care.

***Our Research Sponsors and Corporate Associates are a vital part of the Wharton Risk Center's operations.***

In addition to providing crucial support for the Center's operations, **Corporate Associates** participate in roundtable discussions and offer insight into the value, direction and timing of research projects. **Research Sponsors** provide funding for specific research initiatives of mutual interest and regularly interact with Risk Center directors, faculty and fellows to discuss updates on these initiatives. Associates and Sponsors attend our workshops and conferences at no cost. These meetings offer an opportunity to consult with experts and policy makers from research institutions, industry and government agencies from the U.S. and abroad.

The Risk Center is inviting select organizations to become **Strategic Partners**. With a multi-year commitment, Strategic Partners will play a key role in shaping the Center's future research agenda. Strategic partnership with the Risk Center will enable these companies to impact the future of their industry, as well as best practices, market innovations and future regulations. Strategic Partners will also benefit from greater visibility and customized relationships across Wharton through membership in the Wharton Partnership, Wharton's primary vehicle for fostering industry-academic collaboration.

***We invite your involvement in the Center's leading research.***

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Or visit our website at <http://opim.wharton.upenn.edu/risk/sponsors.php>

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*For over 25 years, the Risk Management and Decision Processes Center at the Wharton School has been at the forefront of basic and applied research to promote effective corporate and public policies for low-probability events with potentially catastrophic consequences. The Wharton Risk Center has focused on natural and technological hazards through the integration of risk assessment and risk perception with risk management strategies. After the attacks of September 11, 2001, research activities were extended to include national security issues (e.g., terrorism risk insurance, protection of critical infrastructure).*

*Building on the disciplines of economics, finance, insurance, marketing, psychology and decision sciences, the Center's research program is oriented around descriptive and prescriptive analyses. Descriptive research focuses on how individuals and organizations interact and make decisions regarding the management of risk under existing institutional arrangements. Prescriptive analyses propose ways that individuals and organizations, both private and governmental, can make better decisions regarding risk. The Center supports and undertakes field and experimental studies of risk and uncertainty to better understand the linkage between descriptive and prescriptive approaches under various regulatory and market conditions. In the past two years, the Center has significantly increased its size so that it can undertake large-scale initiatives.*

*Providing expertise and a neutral environment for discussion, Risk Center research investigates the effectiveness of strategies such as incentive systems, risk communication, insurance and regulation in the context of extreme events. The Center is also concerned with training decision makers and promoting a dialogue among industry, government, interest groups and academics through its research and policy publications and through sponsored seminars, roundtables and forums. Our Newsletter and Project Snapshots provide updates of Center activities and publications.*

## Risk Center on the World Wide Web

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