

Risk Management REVIEW

Wharton

RISK MANAGEMENT
AND DECISION
PROCESSES CENTER
SPRING 2003

Our Appreciation to Phil Lewis

At the April 2003 Risk Center Advisory Committee Meeting, Dr. Philip (Phil) Lewis of Rohm and Haas, who had been chairperson for 3 years, was succeeded by Elizabeth (Liz) Miles of Johnson and Johnson. An appreciation dinner to honor Phil took place the eve of the Advisory Committee Meeting. The evening featured a talk by Dr. Ellen Silbergeld of the Johns Hopkins School of Public Health on the topic "From Command and Control to Cooperation and Creativity". We are pleased to announce that Ellen has agreed to become a member of the Advisory Committee.

During Phil's tenure as chairman, the shock of September 11th, evoked the reality of a class of low probability, high consequence events related to terrorism. The Extreme Events Project and work on Interdependent Security and Global Supply Chain Interruption have become part of the Risk Center portfolio as a result of 9/11. The focus on chemical plant security set back efforts to move ahead with the regulatory revisions that would have facilitated third party auditing against Risk Management Plans. However, the Near Miss project has now expanded its focus beyond chemical plant incidents to the financial world. The Accident Epidemiology work has also proceeded and the initial analysis of the data will soon be published.



Liz provided the Risk Center with a series of challenges as she closed out the AC Meeting on April 29. These are summarized in her article on page 4. She encouraged the Center to be focused on the needs of specific stakeholders, i.e. to be customer driven. She noted that the choices for Research projects must be Specific, Measurable, Achievable, Realistic, and Time bound, in other words, SMART. Newcomers at the Meeting included Norm Willox from LexisNexis, working with the Center on Interdependence in Airline Security and Larry Yuspeh from the Louisiana Worker's Compensation Corp, who is exploring ways that the LWCC can work together with the Risk Center on projects of mutual interest.

INSIDE THIS ISSUE

Director's Corner	2, 3
Systems Approach to Risk Analysis and Policy Making	4
Pricing Terrorism Insurance Coverage: Society's Choice	5
The RMP Rule: Past & Future Center Roudntable: 3/4/03	6
Environmental Management Systems and Financial Incentives in the Public Sector—1/29-30/03	7
Corporate Associates	7
Dynamic Strategies in an Uncertain World	8
Managing and Financing Extreme Risks	8
Advisory Committee	9

Risk Center on the World Wide Web

Visit the Wharton Risk Management and Decision Processes Center's homepage on the World Wide Web at: <http://grace.wharton.upenn.edu/risk/>

Terrorism Insurance: A Case of Market Failure



The market for terrorism insurance appears to have collapsed despite efforts by the government to keep it alive through the Terrorism Risk Insurance Act (TRIA). Congress passed this bill in November 2002

because there was a huge demand for coverage by firms during the year following September 11th and little coverage was available.

Under TRIA's three-year term, there is a specific risk-sharing arrangement between the federal government and insurers that operates as follows. First, the federal government is responsible for paying 90% of each insurer's primary property-casualty losses during a given year above the applicable *insurer deductible* up to a maximum of \$100 billion. The insurer's deductible is determined as a percentage of the direct commercial property and casualty earned premiums of each insurer the preceding year.

TRIA was designed to ease insurer's concerns about providing coverage and to enable buyers at risk to purchase coverage at reasonable prices. Insurers are now required to offer terrorism coverage to their commercial clients, although they have the freedom to set the premium at whatever level they feel is appropriate. Today insurance is widely available but there are few takers. A report by the Council for Agents and Brokers in March 2003 noted that the majority of its members report less than 1 in 5 of their customers has purchased terrorism coverage since TRIA was passed.

If we look at the way individuals and firms make protective decisions, this result is not surprising. It is only after a major flood or earthquake that individuals purchase insurance against these events. If the ground has not shaken for several years or the water has not risen, these same individuals will cancel their coverage. It is hard to convince them that the

best return on an insurance policy is no return at all. There is a tendency for most people to view insurance as an investment rather than as a form of protection.

Now 20 months after September 11th, the concern with damage from terrorism has assumed a back seat. If individuals' behavior toward natural disasters is indicative of attitudes toward terrorism, as it appears to be, many of the firms who have not purchased terrorism coverage consider insurance, even at relatively low premiums, to be a bad investment. Today they believe that if a terrorist attack occurs *it will not happen to me*, whereas in the first few months after September 11th they had the opposite belief.

What is even more surprising are the attitudes held by investors and insurers with respect to providing coverage against terrorism during the period right after September 11th when there was a strong demand for protection. Providers of capital for such coverage required returns in the order of 20 percent per year that, of course, meant that premiums would have to be extraordinarily high. Suppose the market rate of interest is 8%. If a risk neutral investor were considering whether to put his money into supporting terrorism insurance, he would find this option to be attractive as long as the annual probability of a terrorist attack destroying the insured piece of property were less than 1 in 10.

It is hard to construct a credible scenario where the odds of such an event are as high as 1 in 100. Even highly risk averse investors should find this investment to be very attractive.

Why are suppliers of protection so reluctant to do so unless they get a handsome high return on their investment? A recent report by Conning and Company on *The Insurability of Terrorism Risk* indicates that insurers are charging high premiums for terrorism insurance because of the uncertainty surrounding the risk. Even though there is considerable ambiguity on the likelihood of a terrorist attack, one should still be able to undertake scenario analyses to justify much lower premiums than are being

offered by some insurers today. For example, suppose one constructed a worst-case scenario with a probability of 1 in 100 that a piece of property would be destroyed. If an insurer were offering \$9 million in coverage then the actuarially fair price would be \$90,000. Today some insurers are charging premiums 10 times that amount for coverage.

The Treasury Department is required by Congress to undertake studies of the supply and demand for terrorism coverage. Based on our knowledge of other disasters, I expect that they will learn that the market has collapsed because buyers believe that the disaster will not happen to them and sellers believe that it will. In these circumstances TRIA will NOT solve the problem. If one wants to create a market for terrorism insurance both buyers and sellers need to do a more systematic analysis of the relationship between the price of protection and the implied risk. There is still no guarantee that firms will be willing to pay more for coverage or that insurers will greatly reduce their premiums. But there is a much better chance that a market for terrorism coverage will emerge than if we maintain the status quo.

Howard C. Kunreuther
Co-Director

Risk and Supply Chain Management



Supply Chain Management has gone through several waves of change in the past few decades. The end result is that improvements in IT and in supply chain management practices have encouraged two

basic trends. In procurement relations supported by contracts, we have seen inter-organizational systems and procedures develop to improve the integration of buyers and sellers and to coordinate their capacity planning, production, credit/settlement and logistics operations. In procurement relations supported by arms-length market sourcing, we have seen the emergence of various types of e-procurement, from company-driven portals to B2B exchanges. In this latter area, developments in business networking and Enterprise Resource Planning (ERP) have been the primary enablers linking market-generated requirements seamlessly with supply chain management, enterprise planning and fulfillment systems. There have been major impacts from these joint developments, including leaner supply chains, increased outsourcing, increased customization of product and delivery options to final customers, and much improved systems to measure and understand profitability.

In parallel with these developments, risk management has begun to assume a much more important role in strategy. No longer is it the case that supply design decisions are made on the basis of pure cost and revenue determinants, or even combined financial measures such as ROA. Rather, these simpler metrics are being augmented by detailed risk assessments measuring the impact of supply chain decisions on the entire distribution of profits and returns, including the potential consequences for earnings that might occur through disruptions to normal supply chain operations. The

Wharton Risk Center has begun to play an active role in evaluating alternative strategies for managing these risks.

The basic framework for managing supply chain disruption risks is derived from the general risk analysis framework: (i) identify underlying sources of risk; (ii) determine the pathways by which such risks can materialize; (iii) estimate the potential consequences of these risks under various scenarios; (iv) provide the means for mitigating and coping with these consequences; (v) prepare for and rehearse emergency response scenarios. Supply chain risk analysis extends from virgin resources to suppliers, through product transformation to customers. Risk analysis has the task of identifying and quantifying sources of risk along this extended supply chain and determining appropriate mitigation and response strategies. The Center Supply Chain Risk Management Project will consider two fundamental aspects of disruption risk, those related to accidental triggers, including natural hazards, and those arising from purposeful agents, including terrorism risks.

Disruption risks in supply chains are typically focused on three areas: (1) the design of the product supported by the supply chain; (2) the supply chain itself, including location of inventories, transportation modes, and sourcing arrangements; (3) the operational control of the supply chain. For each of these three decision/design issues, a gated screening process is usually the way in which the classical risk management paradigm is implemented. Screens include serious environmental, health and safety impacts of the product, as well as potential disruptions to manufacturing and transportation modes. Data for assessing these can come from a variety of sources, including the RMP data, which has been the focus of considerable effort by the Center in the Chemical Industry (see the write-up of the March 4th Roundtable for additional information). Different approaches are,

however, used for accidental triggers and purposeful agents.

For accidental triggers, benchmarking (both internal and external) and industry or sectoral studies can provide an on-going basis for understanding the sources of major disruption. For purposeful triggers, a process that has been known in the military for some time is useful, that of role-playing or "red-blue teaming" approaches. Under this approach, supply chain experts, equipped with whatever information is available, attempt to "attack" the supply chain to cause major disruptions. The Red Team in this exercise generates a set of scenarios that they believe can lead to serious disruptions. The Blue Team attempts to provide mitigation or countermeasures that are cost effective against the Red Team scenarios. A multi-level exercise at each link of the supply chain directed towards uncovering significant vulnerabilities can be very effective both in understanding the vulnerabilities of a supply chain to disruptions as well as in making members of the risk management team aware of what can be done to either mitigate these or at least to be prepared to respond to them.

There are a host of interesting implications arising from the above considerations for practice and for research related to improving the practice of risk management of supply chains. These are yet to be explored as we attempt to determine what best practices have emerged in industry related to supply chain risk management, including: organizing to coordinate risk management at the SBU and Corporate levels; new models of decision making to accommodate/profit from risk; internal and external monitoring and management systems; and the integration of such practices with existing process management practices and ERP systems. The Risk Center looks forward to playing an integrative role in identifying and evaluating these practices going forward.

Paul R. Kleindorfer
Co-Director

Systems Approach to Risk Analysis and Policy Making



As the new chairperson of the Risk Management and Decision Processes Center Advisory Committee, I would like to thank

Phil Lewis, Director of EH&S for Rohm and Haas for leading the Committee for the last three years. Under Phil's leadership, the Center has conducted important research that has provided industry, government, academia and the community with information that will reduce risk and provide a safer environment for all of us.

The purpose of the Advisory Committee is to help the Center select pertinent research in the areas of risk management and risk management policy that influence decisions that affect both the private and public sectors in ways that reduce the potential harm to people, property and the environment. The participation and collaboration of industry, government, academia and the community is an essential part of defining the Center's research and outreach activities. This collaboration will determine the areas for study that will contribute to the health and well-being of our people, institutions and the environment that sustains us.

The Center's support comes from the financial contributions and engagement of its members. In return, the Center conducts research in areas of risk assessment, risk management techniques, and policy that will reduce the potential for low probability, high consequence events. Member organizations contribute to the direction of research by providing representatives who help shape the areas of investigation by presenting real-world issues and problems for study. The research conducted by the Center answers vital questions and provides solutions that have the potential of mitigating risk.

I would like to challenge the group to think about risk management from a systematic point of view. The re-

search conducted by the Center in this regard would provide an analysis of all the elements that make up risk and define the influence of each component. Investigation of risk using a systems approach that looks across functional areas to examine common and/or interrelated issues would provide additional opportunities to identify potential threats to the health of our businesses, institutions and communities.

A systems approach that includes analysis of all the parts that constitute successful risk management strategies would open new areas of research for the Center and help answer some of the questions that plague us. For example, should we examine the people component of risk management as an element as important as monitoring for contaminants and engineering the elimination of hazards? Do we really understand why people take risks? Do we know what determines the level of risk an organization is willing to accept or why they find that level of risk acceptable? How do we determine the appropriate investment to make in the education of the community, our workforce, and business school students about risk management and or policy? Are we providing the necessary information to our doctors, nurses and health professionals about their role in the management of risk? Do our safety & health professionals understand what influences the behavior of those they seek to protect? If not, why not? We must look at the whole picture to be certain that we have the information necessary to make the best risk management decisions and develop the most comprehensive risk management policies.

These questions and others are areas ripe for research, but to answer them we have to look at the whole system and define the role each function plays in the larger picture. A systems approach would provide a method of analyzing all the components that influence risk and identify the gaps in our knowledge. We need to question all things that determine our vulnerability to risk.

Environmental exposure to the community, exposure to health and safety

hazards in the workplace, the threats of terrorism to our country all require a plan to reduce risk. The research provided by the Center can help us understand these issues and develop techniques and tools that will provide us answers that result in public policy that protects our people and our assets.

I look forward to a productive term as the chairperson of the Advisory Committee. I am delighted to be working with this dedicated Committee and contributing to the exciting, important research the Center is undertaking.

Elizabeth N. Miles

Global Manager of Safety Learning
& Development Safety & Industrial
Hygiene
Johnson & Johnson

Pricing Terrorism Insurance Coverage: Society's Choice



The increased risk of terrorist activities in the United States calls for the development of a national system of coverage against terrorism to provide adequate reimbursements and indemnification to victims of catastrophes. This is part of the *recovery* component of the National Strategy for Homeland Security as defined by the US Administration in July 2002. In case of major attacks, such a system must be adequately designed to assure business and social continuity in the country.

After 9/11, most industrialized countries around the world have been trying to invent new solutions for covering the terrorism risk. On November 26, 2002, the US Congress passed the Terrorism Risk Insurance Act (TRIA) to facilitate a large market for terrorism coverage. However, demand is still quite low. Should a large-scale terrorist attack occur, it would imply a significant impact on business continuity, as most of businesses would not be covered with insurance.

Howard Kunreuther highlights in this newsletter the fact that the market for terrorism insurance in the US appears to have collapsed, essentially because of asymmetry of risk perception between sellers and buyers of coverage. Deprived of reinsurance for the residual risk not covered by the federal government and having the freedom to set premiums, it is likely that insurers are viewed as having systematically overpriced coverage by potential buyers.

As in France, Germany and the UK, TRIA establishes a public-private partnership to cover terrorism risks. But TRIA also presents some fundamental differences from the European systems. First, insurers are obliged to offer terrorist coverage for commercial property lines of business in the US, but the purchase of

insurance is not required. Second and more important, no defined scale of premiums has been established nationwide in the US.

In Germany, firms can be insured by Extremus AG, a government backed up insurance company created in November 2002 and composed of insurers and reinsurers; the agreement is limited until 2005. The prices of coverage, which are fixed nationwide, only depend on two elements, the level of the sum insured and the maximum coverage. Price does not depend on the location of the property. For instance, the premium for a 50 million sum insured property with full coverage is 12,500 euros (i.e. 0.25 per thousand of coverage).

In France, commercial terrorism coverage is mandatory thus avoiding any adverse selection problem. Insurers transfer risks and premiums to Gareat, a pool of insurers/reinsurers that has an unlimited guarantee by the government: the French government pays any losses above a given threshold (1.75 billion euros in 2003). The agreement with Gareat's stakeholders must be renewed by the Government every year. Gareat has been operating since January 1st, 2002 and only accepts risks with a minimum amount insured for direct damage and business interruption of 6 millions euros. The premium scale charged against insurers by Gareat only depends on the amount of coverage, whatever the location of property: between 6 and 20 millions, the pool Gareat charges 6% of the basic Property and Casualty (P&C) premium; between 20 and 50, 12% and finally, for insured coverage between 50 and 750 millions euros the pool charges 18% of the basic P&C premium. For sum insured above 750 millions euros, the premium rate is quoted individually.

In the UK, insurance rates have been regulated until January 1, 2003 when changes were introduced in Pool Re's operation. Insurers are now free to set the premium for underlying policies. But most insurers still transfer risks to Pool Re – a pool of insurers/ reinsurers created in 1993 and backed by the national government. And prices for “all

risk basis” coverage by Pool Re mainly depend on the location of the property. There are 4 different areas: 2.3 per thousand of coverage for Central London, 1.16 for other London and major cities, 0.22 for the rest of England excluding Devon & Cornwall for which rate is 0.1 per thousand of coverage.

Of course, as a result of national particularities and differing risk perceptions of the likelihood of future terrorist attacks, prices differ from a country to another. But all three premium scales in the European countries emerged as a consensus between representatives from government and the insurance industry; and they remain far below current insurance prices in major American cities. Those scales were also associated with the creation of a national pool of insurers. The definition of a limited exposure of the pool allows insurers to transfer more easily some risks to reinsurers who cover some layers of it. As a result the reinsurance industry is an integral part of all three systems.

Although those rates are not defined to be *actuarially priced* they still reflect the degree of exposure to possible terrorist attacks, by location or by amount insured. That choice was made when considering the real difficulty in appropriately pricing terrorism risk exposure in a country. Indeed, for reasons associated with the nature of terrorism itself, it would be unreasonable to pretend to actuarially price such risk.

The recent development of a first generation of models to quantify terrorism risk strongly contributes to a better understanding of the exposure associated with specific scenarios of attack and targets. The role of those models is not, however, to determine expected losses in a probabilistic sense but rather to provide insight into potential losses.

At the end, the choice between prices resulting from pure demand/supply equilibrium on each insurance policy and a national scale of rates is a choice each society has to make. In the United States that choice will have to be made when it is time to renew or not renew TRIA. In

continued on page 7

“The RMP Rule: Past & Future” — Center Roundtable: March 4, 2003

A Roundtable was held at Wharton on March 4th to discuss the past and future of the RMP Rule. The Roundtable gathered representatives from industry, government and academia to review research results to date based on the 1999-2000 tranche of RMP data and to consider how RMP could be improved to obtain better data and better value from the Rule when the next tranche of data is collected in 2004?

The Roundtable began with a discussion of recent results obtained by the Wharton Team and summarized in several papers (see the Risk Center Working Paper list on the Center website) resulting from the project. The first of these, written jointly between the Wharton Team and CEPPO, presents a summary of the descriptive statistics of reporting companies under the RMP Rule, including OCA data. The second of these considered the relationship of overall facility hazards and other characteristics such as size (as measured by FTEs) on the facility's accident record. The Wharton Team also discussed recent results on the characteristics of the surrounding community and their association with accident rates of facilities they host. In addition to discussion of these papers, new results on the impact of economic and financial variables related to a facility's parent company were presented.

The discussion of the results concerning community characteristics highlighted the importance and impact of the panel data collected under RMP. The Center analysis of the RMP data, coupled with Census Data, showed that larger and more chemical-intensive facilities tended to be located in counties with larger African-American populations and in counties with high levels of income inequality – that is, counties with both higher median incomes and higher levels of poverty. This finding is not surprising and echoes results from several other studies. More surprising is the finding that, even after adjusting for location risk, substantial residual risk of accidents remains for facilities in heavily African-American counties. These findings gave rise to a discussion on existing policies designed to reduce the probability of locating facilities in an inequitable fashion, as well

as health surveillance, and regulatory monitoring and enforcement activities to ensure that hazardous facilities in minority communities operate according to the same standards as elsewhere in respect to preparedness and prevention of chemical accidents and releases.

The discussion of the Wharton Center results was nicely complemented by results from similar studies at the Mary Kay O'Connor Center for Process Safety (Texas A&M University). The Center's Director, Sam Mannan, presented results on the 1st Chemical Safety Assessment Report, and emphasized the need to expand the data available for analyzing environmental and process safety effects of various management system and contextual factors. He focused his comments on comparative data his Center has been analyzing from the HSEES database available through ATSDR, which showed that the RMP data could be missing significant accident results available in other databases. Dr. Mannan noted that a detailed analysis of RMP and other results on process safety and accident prevention would take place at Texas A&M on October 28-29, 2003. (For information, please see the Mary Kay O'Connor Center website.)

This discussion of past results led naturally to a focus on the future. In a discussion led by Armando Santiago and Dorothy McManus of U. S. Environmental Protection Agency/CEPPO, the Roundtable focused on what was likely to be changed and what was likely to remain the same in the 2004 data collection effort. They discussed streamlining the process of submission, and also data availability issues, the latter having become much more difficult because of the events of 9/11/01. Some changes that are being considered include more frequent reporting of accidents (e.g., annual or at the time of the accident) and various improvements to location data for facilities.

The Roundtable continued with a discussion led by Irv Rosenthal (Chemical Safety Board), Robert Lowe (Oregon Health and Science University) and Howard Kunreuther (Wharton) of the challenges and opportunities in achieving better value from the RMP process going forward. This was followed by small

group discussions focused on a range of issues, including data quality, oversight regulators such as the Chemical Safety Board, interagency cooperation be furthered (e.g., OSHA-EPA, DHS-EPA), Third Party Inspections to assure compliance and to data quality in the RMP process, the role that private insurance can play in encouraging compliance, and the integration of site security systems with the RMP process.

While there is obviously much yet to be accomplished, this Roundtable concluded with a deep sense of appreciation for what has been accomplished thus far through the combined efforts of CEPPO, the American Chemical Council, the Center for Chemical Process Safety, the National Institute for Occupational Safety & Health, and many others working in the area of accident preparedness and prevention. The Roundtable helped to underline the tremendous importance of the RMP data in establishing benchmarks for current performance and for promoting a better understanding, through the research process, of the precursors and outcomes of accidents and injuries in the U.S. Chemical Industry.

Following the conclusion of the Roundtable, Professor Cary Coglianese, J. F. Kennedy School, Harvard University, presented a lecture based on his paper, “Management-Based Regulation: Prescribing Private Management to Achieve Public Goals”. The lecture was co-sponsored by the Penn Institute for Environmental Studies, Business & Environment Seminar Series. Drawing on case studies of management-based regulation in the areas of food safety, industrial safety, and environmental protection, Dr. Coglianese discussed how management-based regulation could be an effective strategy when regulated entities are heterogeneous and regulatory outputs are relatively difficult to monitor. In addition to analyzing conditions for the use of management-based regulation, the presentation assessed the range of choices regulators confront in designing management-based regulations, including regulation such as the RMP Rule that is more informational than prescriptive in its orientation.

“Environmental Management Systems and Financial Incentives in the Public Sector” — January 29-30, 2003

At the end of January 2003, an Environmental Management Systems and Financial Incentives in the Public Sector workshop was held, sponsored by the US EPA, U. of Pa Institute for Environmental Studies, the Risk Center, and the Global Environment & Technology Foundation. The goal of the workshop was to identify relationships and benefits between entities in the public sector that implement environmental management systems (EMS), including ISO 14001, and the financial and insurance sectors who cover risk and provide capital to public sector entities.

Case studies were presented to demonstrate linkages between EMS and the financial service providers. The Port of Houston identified the positive experiences they had with their insurance carrier through their EMS efforts, the readiness to respond to risks as a part of their underwriter review and the potential for significant insurance savings as well as other cost savings. Jefferson County, AL also presented the benefits accrued through their application of an EMS, costs savings from EMS, and potential savings for a significant bond rating increase for a 2 billion dollar bond for their wastewater treatment plant partially due to the EMS. Both public entities made the transition from compliance issues to model national organizations meeting and exceeding com-

pliance requirements through the EMS application. Representation from the other stakeholder groups included an array of state and EPA officials as well as representatives from the financial communities who play an important role within their organizations in terms of potential linkages between EMS and financial instruments. Key findings from the workshop are:

- The use of EMS by public entities is growing and has established itself as a valuable tool for environmental protection.
- The Financial Community needs more specific, targeted data showing that EMS results in quantifiable risk reductions
- Public entities need to show quantifiable benefits in order to gain management support
- Better education, communications, and marketing is needed for EMS to reach its full potential
- Government regulators need to continue to find ways to encourage public entities to use EMS and to continue to take a leadership role in advancing the relationships between EMS/ISO, financial, and environmental interests

A number of potential next steps was identified and listed in the Workshop's Summary Document. These and the entire Document can be found at www.peer.net.

CORPORATE ASSOCIATES

The Corporate Associates program is a vital part of the Risk Center's operation. Corporate Associates sit on the Center's Advisory Committee, participate in roundtable discussions and offer information and insight into the value, direction and timing of research projects. The Center currently receives approximately \$265,000 annually from Corporate Associate Members.

ACE USA

**American Re-Insurance Services, Inc.
DuPont**

ECS Incorporated (an XL Capital Company)

Eli Lilly

**GeneralCologne Re
Johnson & Johnson**

**Lockheed Martin Radiant Trust
National Institute of Standards and Technology (NIST)**

**Non-Life Insurance Rating
Organization of Japan**

Phelps Dodge Corporation

Rohm and Haas Company

State Farm Fire and Casualty Company

Sunoco, Inc.

Swiss Reinsurance Company

Tillinghast-Towers Perrin

Wachovia Securities

Zurich Insurance Company

For information about membership in the Corporate Associates Program, please contact :

Paul R. Kleindorfer:

phone, 215-898-5830

fax, 215-573-2130

e-mail, kleindorfer@wharton.upenn.edu

or

Howard Kunreuther

phone, 215-898-4589

fax, 215-573-2130

e-mail, kunreuther@wharton.upenn.edu

Pricing Terrorism Insurance Coverage

Continued from page 5

this regard, advanced analysis and specific studies the Wharton Risk Center could develop in partnerships with its sponsors and Columbia University may help to provide insights for choosing between alternative programs.

Although terrorism risk coverage is, of course, only a part of the National Strategy to improve global preparedness against terrorism and assure the

continuity of activity, it may be one of the most visible components for the administration to stake a position on next year. After all, 2004 is also a presidential election year.

Erwann Michel-Kerjan

Postdoctoral Fellow at the Risk Center, Fall, 2002/Spring 2003
erwannmk@wharton.upenn.edu

Dynamic Strategies in an Uncertain World

A dynamic theory of strategy attempts to understand the evolution of competitive positions over time. This field of research has so far received scant attention in strategy theory. Research on strategy has till now concentrated on understanding superior competitive positions at a given time, i.e. has pursued an essentially static approach. The absence of a dynamic theory of strategy has been criticized not only from a theoretical perspective, but also as regards actual management practice. Managers need inputs that are based on a dynamic strategy because shareholders, for instance, demand future plans as a foundation for their investment decisions.

Although there is no best general framework for strategic management, it is possible to infer some basic factors that influence the success of the strategy-making process, including dynamic settings. In highlighting such factors, it is important to keep in mind that it is more the dynamic interrelationships among factors that determine success in a dynamic setting. In particular, it is not enough to derive variables influencing the

evolution of competitive positions from a content-oriented explanatory framework; one needs to understand how these are embedded in the dynamics of the process itself. From the perspective of the strategy designer, this includes:

1. The ability of the company/strategy to adapt to environmental changes (in comparison to competitors);
2. The relationship of underlying technology, market and regulatory factors on the actions of the firm, reactions of competitors, and the development of the market over time;
3. The balance of competence upgrading and renewal (as compared to competitors) from the resource- or competence-based view of competition as a race for competencies.

Thus, a dynamic view of strategy should provide the basis for understanding these factors as they evolve and to deduce adjustment hypotheses that can be tested empirically. In parallel, it is necessary also to deduce hypotheses about the structure of the decision making process that may support or hinder the evolution of competitive positions over time. Im-

portant considerations for dynamic strategies in highly uncertain context would include the degree of flexibility in decision-making and the use of supporting information and control structures.

The influence of decision processes on the efficacy of strategic choice has been a focal point of my visit to the Risk Center, which supplemented my discussions on the content-oriented explanations at the Reginald H. Jones Center. I am thankful that both Centers co-hosted me as a visiting scholar this Spring, and I look forward to a continuing exchange of ideas and collaboration on these important questions in the future.

Heike Proff, Ph.D.
University of Mannheim
Visiting Scholar at the Risk Center
Spring 2003

“Managing and Financing Extreme Risks” — April 28, 2003

On April 28, 2003, a workshop in the continuing series on Managing and Financing Extreme Risks was held at the Risk Center. The meeting was attended by 26 delegates representing insurance and reinsurance companies, risk modelers, and universities. An Executive Summary of the proceedings follows; the full report can be viewed on the Risk Center web site.

Among extreme events that threaten lives and infrastructure, terrorist attack presents the biggest challenge for government and business, particularly for the insurance industry. So little is known about the nature, location, frequency and impact of events such as the attacks of Sept. 11, 2001, that insurers and reinsurers have difficulty assessing and quantify-

ing the risk they may or may not be willing to accept.

Government, now working intensively with the U.S. private sector to share information and build defenses, must seek to secure vital infrastructure, systems and population centers on the basis of previous low-frequency events and on information from intelligence sources about the motivations and organizational structures of those who carry out such attacks. Modelers are also hampered by the same scarcity of information, in contrast to that on natural hazards such as hurricanes or earthquakes, whose location, timing and effect is more predictable because of their history and because they lack a human element.

Most businesses decline to in-

sure themselves against terrorist attack either because of the high cost or because they believe they don't need it. The reinsurance industry, which effectively withdrew from accepting terrorism risk after the losses incurred by Sept. 11, is beginning to resume coverage -- at high prices. But a uniformity of reinsurance products threatens to reduce competition and innovation in the industry.

The Terrorism Risk Insurance Act, designed as a temporary substitute for reinsurance, is itself a source of uncertainty because it is scheduled to expire at the end of 2005. Insurers, reinsurers and modelers are simulating a range of scenarios for future attack and incorporating hundreds of thousands of potential targets into their models.

ADVISORY COMMITTEE

Elizabeth N. Miles
(Chairperson, Advisory Committee)
*Worldwide Manager Safety Learning
and Development
Johnson & Johnson Safety & Industrial
Hygiene*

James R. Ament
*Vice President, Operations
State Farm Fire and Casualty Co.*

Jerome Balter
*Director, Environmental Projects
Public Interest Law Center of
Philadelphia*

Michael S. Baram
*Professor of Law
Boston University School of Law
Professor of Health Law
Boston University School of Public
Health
Partner
Braken & Baram*

David E. Cummings
*Program Manager, Process
Safety Management
DuPont SHE Excellence Center*

John DeMartini
*Vice President, Reinsurance
Towers Perrin*

Richard Franklin
*Senior Vice President, Business Research
& Development Services
ACE USA*

Paul K. Freeman
*Risk Analysis and Policy Project
International Institute for Applied
Systems Analysis*

Tom Gallagher
*Managing Director
Defense & Aerospace Investment Banking
Wachovia Securities*

Carolyn Green
*Vice President
HES Regulatory Affairs
Sunoco, Inc.*

Marc Halpern
*Vice President- Technical Services
ECS Incorporated (an XL Capital Com-
pany)*

Carl G. Hedde
*Vice President
American Re-Insurance Company*

Thomas Hiltman
*Group Product Manager Casualty
Swiss Reinsurance Company*

Leslie C. Koo
*President
Taiwan Cement Corporation*

Philip G. Lewis
*Vice President and Director
Environmental, Health and Safety
Rohm and Haas Company*

Alcira I. Kreimer
*Manager, Disaster Management
Facility
World Bank*

Patrick Liedtke
*Secretary General
The Geneva Association*

Richard D. Morgenstern
*Senior Fellow
Resources for the Future*

Franklin W. Nutter
*President
Reinsurance Association of America*

Lindene Patton
*Risk Management Executive
Zurich Insurance Company*

Harvey G. Ryland
*President and CEO
Institute for Business and Home Safety*

Geoffrey Shaw
*Product Manager for Radiant Trust
Lockheed Martin ISR*

Paul Slovic
*President
Decision Research
Professor of Psychology University of
Oregon*

Special Advisors to the Committee

Scott Berger
*Director, Center for Chemical Process
Safety
American Institute of Chemical Engineers*

Deborah Dietrich
*Director, Chemical Emergency
Preparedness and Prevention Office
U.S. Environmental Protection
Agency*

Isadore (Irv) Rosenthal
*Board Member, U.S. Chemical Safety and
Hazard Investigation Board*

University of Penn Liasons

Harvey Rubin
*Director, Ackoff Center
University of Pennsylvania*

Barry G. Silverman
*Director, Ackoff Center
University of Pennsylvania*

Elaine B. Wright
*Department of Earth & Environmental
Science
University of Pennsylvania*

Keeping in Touch

If you would like to be added to our mailing list, please telephone, mail, email or fax the information to the right to the Risk Center (telephone, 215-898-5688; fax 215-573-2130; email, risk@wharton.upenn.edu.
If you want to be removed from our mailing list, please let us know.

Tara Marie Newman
Risk Management and Decision Processes Center
The Wharton School of the University of Pennsylvania
556 Jon M. Huntsman Hall
Philadelphia, PA 19104-6340

NAME

TITLE

ORGANIZATIONAL AFFILIATION

ADDRESS

CITY/STATE/ZIP

PHONE

E-MAIL

Wharton

**RISK MANAGEMENT
AND DECISION
PROCESSES CENTER**

**The Wharton School
University of Pennsylvania
556 Jon M. Huntsman Hall
Philadelphia, PA 19104-6340**

Wharton Risk Management Review is published periodically during the academic year by the Wharton Risk Management and Decision Processes Center:

Submissions are welcome.
Editor: Peter J. Schmeidler

**The Wharton School
University of Pennsylvania**