



SOCIETY OF ACTUARIES

Risk *Management*

July 2005, Issue No. 5

Newsletter of the
Risk Management Section

Published in Schaumburg, IL
by the Society of Actuaries

Table of Contents

**Chairperson's Corner—Becoming the
Pre-eminent Risk Management Profession**
by Frank Sabatini _____ 2

**Chief Risk Officer – The New Domain for
Actuaries**
by Dorothy L. Andrews and Ken Seng Tan ____ 4

**The 3rd Annual Premier Global Event on
ERM...Where Cutting-Edge Theory Meets
State-of-the-Art- Practice**
by Mark Abbott, Hubert B. Mueller, Max
Rudolph, Fred Tavan, David L. Ruhm, John J.
Kollar, David N. Ingram and Sim Segal ____ 18

Credit Risk Survey Results
by Juan Kelly _____ 23

Operational Risk Management
by Dorothy L. Andrews _____ 24

**Upcoming Conference – Call For Papers
CIA 2006 Stochastic Modeling Symposium**
April 3-4, 2006, Toronto, Ontario _____ 26

**Developing Effective Risk Management
Strategies to Protect Your Organization**
by Fay Booker _____ 27

**ERMII: An International Initiative
Involving Leading Universities and
Professional Organizations**
by Shaun Wang _____ 33

COTOR: Adventures With Risk Theory
by Louise A. Francis _____ 36

Operational Risk Assessment in IT Projects
by Michel Rochette _____ 38

Actuaries

The Best-Kept Secret in Business™

Becoming the Pre-eminent Risk Management Profession

by Frank Sabatini

The Risk Management Section's newsletter has been a resounding success. This is our fifth issue and the quality of the content seems to improve with each issue. However, this issue is special, from my perspective, because it includes four interviews with chief risk officers. *These interviews are a must read!* They provide valuable insight into the profession's future as risk managers and what we need to do to establish actuaries as the pre-eminent profession in the field of Enterprise Risk Management (ERM).

This goal is a natural extension of our experience and training. We've been managing risk as a profession for a long time. But the definition

of risk has changed (if nothing else it's more topical). Today ERM is more than mortality risk or even interest rate risk. The ERM framework expands managing risk to include all risks an enterprise may face. For insurance organizations, it includes financial risk of all forms including: interest rate, equity market, credit, policyholder behavior, to name a few, and nonfinancial exposures such as market conduct and litigation risk. Actuaries are natural candidates for the risk management position in insurance companies because we understand the business and the risks.

Financial service companies (banks) have a risk profile similar to insurance companies (admittedly mortality risk is less of an issue). If you accept my premise of a comparable risk profile, actuaries should be ideal candi-

dates for managing risk in all financial service companies. However, managing risk in any company requires knowledge of the business, and our training and experience needs to expand to capture that knowledge. Actuaries need to begin joining these organizations early in their careers to gain the business foundation and combine it with the professional training they receive. The profession's examination process needs to be broader so that we learn about the other industries we may serve.

My message is fairly simple. We have the inside track on risk management positions in the insurance industry and we have a basis for competing for similar positions in the broader financial services industry.

So how do we know that we have succeeded? The Society of Actuaries' ERM Strategy states:

When actuaries are recognized as the pre-eminent professionals in ERM, they will serve in large numbers throughout traditional areas of practice and also will serve in responsible positions in the broader financial services arena. There is strong evidence of a rapidly increasing demand for ERM professionals. For the SOA's strategy to succeed, it will be critical to increase the number of actuaries trained in this field. The task force considers the recommendations in this report as the minimum actions necessary; continued monitoring and other efforts will be needed.



Frank Sabatini, FSA, MAAA, is a partner in Ernst & Young's Insurance and Actuarial Advisory Services practice in Hartford, Conn. He can be reached at frank.sabatini@ey.com.

Although we have the inside track on insurance companies, we don't always get the position. Some insurance companies have hired nonactuaries in senior risk management roles. These individuals, typically, were selected because of their risk management credentials in banking. They do not have the business knowledge and experience of actuaries, yet their skills and experiences make them qualified candidates. I'm certain that their lack of insurance company experience was a negative, and yet they were hired. So what do they have that we don't, and vice versa? Why aren't we securing similar positions in the financial services industry? The answer is, in my opinion, that our training and experience does not provide us with all of the prerequisites. We have additional skills to acquire!

The good news is that, by my count, actuaries hold the majority of senior risk management positions in the insurance industry. These individuals have or are acquiring those other skills.

Credit risk, operational risk, risk governance, the ability to manage one's way through complex organizations and communicate with diverse audiences, including senior management and the Board of Directors, are some of those skills. We need

to learn on the job if we have not already acquired these skills or seek these skills through more formal training.

To further the cause, the Risk Management Section is now jointly sponsored by the Society of Actuaries and Casualty Actuarial Society. This is a significant event because it brings the two organizations together to present a more unified front in the ERM space. More importantly, it provides an opportunity for us to work as full partners as the leaders of ERM research and education initiatives within the actuarial profession.

When you read the chief risk officer interviews in this issue you'll see the themes reverberate consistently. The Risk Management Section has, as one of its goals, to help its members develop all the skills needed to succeed as risk management professionals. The Section Council has acknowledged that acquiring and improving our skills in nontraditional areas is a critical part of the equation. Together, we can succeed. ♦

“

The good news is that, by my count, actuaries hold the majority of senior risk management positions in the insurance industry.

”



Delivering all you need for your next deal!

The latest and most comprehensive guide on this subject, this must-have text is the work of expert authors from accounting, actuarial, banking and legal backgrounds who provide real-life lessons learned and practical, hands-on techniques that immediately can be applied in today's swiftly moving M&A environment.

For more information and to order a copy, visit the SOA Web site at <http://books.soa.org/ma.html>.



Chief Risk Officer—The New Domain for Actuaries

by Dorothy L. Andrews and Ken Seng Tan



Dorothy L. Andrews, ASA, MAAA, is second vice president, risk management, with Transamerica Reinsurance in Charlotte, N.C. She can be reached at Dorothy.Andrews@transamerica.com.



Ken Seng Tan, ASA, Ph.D., is Canada Research Chair Associate Professor in quantitative risk management at the University of Waterloo in Ontario, Canada. He can be reached at kstan@uwaterloo.ca.

A new frontier is unfolding on the geography of insurance and it is yielding fertile ground for actuaries with talent, vision and a strong sense of responsibility. Risk management, sometimes called Enterprise Risk Management (ERM), and often inclusive of Operational Risk Management, is not a new concept to fields such as banking, manufacturing, informational technology and telecommunications. Even the armed forces have policies and procedures to mitigate operational risks.

So, why has it taken the insurance industry so long to recognize the need to install risk surveillance systems? And to appoint a team with full-time responsibilities to steer companies clear of activities that jeopardize the ability of insurer's to make good on all those promises made to policyholders? It may not be important to find the answers to these questions, but who is better suited to the task of risk management than actuaries—after all, studying and hedging risk comes so naturally to us. However, we as actuaries no longer live in a world where C1, C2, C3 and C4 risk can be our only focus. The environment and our policyholders are more dynamic, with characteristics now studied using sophisticated stochastic models. This alone charts the course we must all follow into new territory and provides the impetus for developing effective tools and prudent policies to mitigate risks that would adversely affect company value.

This article is a conversation with four eminent actuaries—Douglas Brooks of Sun Life Financial, Tony Coleman of Insurance Australia Group, Beverly Margolian of Manulife Financial and Craig Raymond of Hartford—discussing their rise to the rank of Chief Risk Officer (CRO). The goal of this conversation is to guide others through the process of establishing CRO topographies in their companies.

Let's get started.

An Interview with Douglas W. Brooks, FSA, FCIA, MAAA, B.Math – Sun Life Financial



Douglas W. Brooks attended the University of Waterloo in mathematics and actuarial science, joining Mutual Life after graduation. At Mutual Life (later Clarica), he spent a number of years in actuarial positions in group pension, computer systems and the individual division. In the individual division, he had increasing responsibility for product design, pricing and dividends for individual insurance products, along with financial analysis and projections of individual division products. He was heavily involved with a number of acquisitions, including the acquisition of Prudential of England's Canadian business.

In 1997, Brooks accepted a position as chief actuary, overseeing the actuarial aspects of the company's demutualization, as well as the role of the appointed actuary for the company. Additionally, he was involved with the acquisitions of MetLife's Canadian operation and Sun Life's reinsurance business. In 2000, he was appointed senior vice president and chief actuary, and added responsibilities for capital management, risk management and internal audit. In June 2002, Brooks was appointed

vice president and CRO at Sun Life, upon the acquisition of Clarica, where he has accountability for developing an enterprise-wide framework for risk management.

Brooks has acquired a number of industry involvements, which include: involvement with actuarial education committees, the CLHIA committee on solvency and capital, and within the Canadian Institute of Actuaries as a member of the CIA committee on the role of the Appointed Actuary; past chairman of the Life Practice Committee of the Canadian Institute of Actuaries; current chair of the CIA Committee on Risk Management and Capital Requirements and a member of the CIA's Board of Directors, as well as leading a committee on source of earnings disclosure. He is also on the Council of the SOA Risk Management Section.

Let's look at his responses to our interview questions:

1. It is clear that risk management is a much more important topic at your company today than several years ago. What do you see as the primary motivations for elevating the enterprise risk management function in your company?

There are a number of reasons for the increased importance of enterprise risk management. These include the ever-increasing nature of both our products and the market instruments with which to hedge their risks, as well as an increasingly challenging regulatory environment.

2. Who has sponsored the initiative?

Senior management and the board have sponsored the development of risk management as a function within the organization.

3. How does your experience make the transition into this position easier, and what gaps have you recognized?

Business experience is critical to building an effective enterprise risk framework. There are a number of gaps inherent in traditional approaches to risk management, which tend to be focused on individual risks. So, aggregation of risks and reflection of diversification is something that hasn't had a lot of attention or tools with which to measure its impact. Operational risk is also an area that lacks tools and

approaches to comprehensively measure and manage on a consistent basis.

4. What is the mission statement of the office of the CRO in your company?

The mission is to contribute to shareholder value by providing a framework to ensure the organization makes appropriate risk-adjusted business decisions.

5. What do you see as your number one challenge as CRO?

Prioritization—putting the emphasis in the areas that need the most attention while doing so as part of an integrated whole.

6. How would you describe the risk management function's relationship with the various business units in your company today? How has it evolved? What challenges remain?

The company is operationally decentralized, and its various businesses are quite different in nature and business model. Therefore, what works in one business may not work in another. Building technical expertise in developing markets where resources are scarce and retention is challenging is particularly difficult.

7. What risks get the most attention and why?

Risks are prioritized based on assessments of probability and severity. The company has a lot of equity exposure given its significant wealth management businesses and variable annuity and segregated fund businesses. Legal and regulatory risk is also significant given the current environment, particularly in the United States.

8. Creating a risk culture is part of the enterprise risk management process. Describe where your company is in the process, and what are some of the biggest challenges?

Culture is the single most important factor in the success of enterprise risk management. Given the sponsorship of risk management by the board and senior management, there is a high level of awareness of the importance of risk management. One challenge is to develop a "measure" of culture to provide a basis for assessing improvement.

“

There are a number of gaps inherent in traditional approaches to risk management, which tend to be focused on individual risks.

”

continued on page 6 ■

Chief Risk Officer — The New Domain for Actuaries

▶ continued from page 5

9. What functions are included in your portfolio of risk management responsibilities?

The risk management function is accountable for developing a framework within which all risks of the organization are consistently measured. These include financial risks, as well as operational risks. The corporate role involves developing the framework, communicating it, developing tools if capabilities do not exist elsewhere and then monitoring and reporting on the management of risks in the organization.

10. Do you have a risk policy, and if so, what was your process for setting it up?

We have a number of risk policies for the management of financial and operational risks, including risk tolerances. Policies are developed by the corporate “function owners,” including risk management.

11. What are some of the main regulatory guidelines you need to be cognizant of in performing your duties as CRO, or to what extent does the Sarbanes-Oxley Act help to shape the development of risk policies for your company?

Our primary regulator, Office of the Superintendent of Financial Institutions (OSFI), takes a risk-based approach to assessing organizations. Regulatory guidelines are obviously important, but the business should drive the establishment of appropriate policies for the organization. Part of this will involve ensuring compliance with policies or practices required by regulators.

12. Discuss the risk governance structure at your company. To whom do you report? Do you have board-level reporting? Is there an Executive Management Risk Committee?

I report to the executive vice president and CFO. I am accountable for reporting to the Board’s Risk Review Committee on risk issues. There is an Executive Risk Committee that includes the CEO, COO, CFO and general counsel.

13. What type of reporting is routinely done? What’s your vision for the future as it relates to risk position reporting?

We report on both financial and operational risks. This includes analysis of income sensitivities to market risks, as well as the effectiveness of hedging programs and assessments of operational risks. My vision would be to provide an overall picture of the company’s risk profile, on a consistent basis, with trending of key risk indicators.

14. What qualifications does someone need to function as a risk professional in your department?

Risk management requires different perspectives to be effective. The primary qualifications are an understanding of the business and an inquiring mind—perhaps even healthy skepticism. Some roles require specific technical expertise—actuarial backgrounds are useful because of the training in the insurance-based businesses, but other skills add to the mix.

15. What do you see as the future importance and prospects for the office of the CRO?

I believe that risk management is a vital function in any organization, particularly financial institutions. It is important that risk management not be viewed as the function that manages all the risks of the organization, but that it provides the framework and tools by which risks are managed, and that it encourages everyone to think like a risk manager. Every organization can benefit from this type of framework, though it will look different and have different emphasis in different organizations.

16. How does your ERM function help protect or enhance shareholder value, minimize operational risk and ensure solvency?

A risk-based approach to management helps to ensure that business decisions reflect these factors. To be effective, risk management must be proactive, addressing issues before they become problems. The question notes the fact that risk management applies across a broad spectrum of concerns—financial and nonfinancial, shareholder value and long-term solvency.

“

I believe that risk management is a vital function in any organization, particularly financial institutions.

”

17. What do you see as the most important tools you need to be effective in your role?

Communication with business leaders and managers is particularly important. The role must encourage business decision-makers to think like risk managers and to know where to go for tools and resources to help make better risk-adjusted business decisions.

18. How did your skills and experience as an actuary position you to earn the CRO title?

The actuarial training provides a solid basis in the technical understanding of the business and its risks. It is an ideal basis for risk management in an insurance-based financial institution where the most significant risks are those related to long-term liabilities in our products.

19. What advice would you give to other actuaries who aspire to be CROs?

Learn and understand the business. Listen to different perspectives and incorporate them into the overall understanding of the business. Avoid “tunnel vision,” whether from professional training or business background.

An Interview with Tony Coleman, FIA, FIAA, MBA, BA – Insurance Australia Group



Tony Coleman is the CRO of Insurance Australia Group (IAG), the largest general insurer in Australia and New Zealand. Reporting to the CEO, his responsibilities include all aspects of risk management at IAG—insurance product pricing policy, valuation of claim

liabilities, R&D, operational risk monitoring, fraud and security risk control and the internal audit and compliance functions for all of IAG's businesses. Prior to joining IAG in December 2000, he was a senior corporate finance partner of Price Waterhouse Coopers (PWC). His 15-year career as a partner at PWC covered both internal management roles building businesses and a diverse range of business valuation and corporate finance advisory work for clients in a wide range of industries. Tony also has extensive financial services industry experience, having worked earlier in his career in both banking and life insurance.

Throughout his career, Coleman has played an active role in the actuarial profession. He was president of the Institute of Actuaries of Australia (IAAust) in 2001, and later chairman of the IAAust's HIH Royal Commission Taskforce. On the international front, he is vice chairperson of the Financial Risks Committee of the International Actuarial Association (IAA) and is a member of the IAA Insurer Solvency Subcommittee. In 2004 Tony received the prestigious “Actuary of the Year” award from IAAust. He was recently appointed as the only Australian representative on the International Accounting Standards Board Insurance Working Group, which was formed to provide advice to the IASB on its International Insurance Accounting Standard project. He is a Fellow of the Institute of Actuaries of Australia (FIAA) and holds BA and MBA degrees from Macquarie University in Sydney (where he also won the Allen Knott memorial award for best overall performance in his year for the MBA degree).

Let's look at his responses to our interview questions:

1. It is clear that risk management is a much more important topic at your company today than several years ago. What do you see as the primary motivations for elevating the enterprise risk management function in your company?

The need to manage the true volatility of the business (not just the volatility of reported profits) and the need to coordinate risk acceptance criteria across the organization rather than in silos.

continued on page 8 ■

“

A risk-based approach to management helps to ensure that business decisions reflect these factors. To be effective, risk management must be proactive...

”

Chief Risk Officer — The New Domain for Actuaries

▶ continued from page 7

2. Who has sponsored the initiative?

The CFO, who saw ERM as expanding beyond the CFO role and becoming an area that demands its own senior expertise and function.

3. How does your experience make the transition into this position easier, and what gaps have you recognized?

Actuarial understanding of risk combined with 15 years working in a major accounting firm gave me a broad understanding of the relevant issues, including how internal audit can add value and the impact of risk on the corporate share price.

4. What is the mission statement of the office of the CRO in your company?

“Turning risk into value.” This statement emphasizes the positive sense of being able to take risk to earn a return in a controlled way, not just the negative aspect of seeking to always reduce or eliminate risk.

5. What do you see as your number one challenge as CRO?

The number one challenge is creating a genuine culture and shared vision across the organization so that each of our 11,000 people will proactively manage risks in the same way without “shooting messengers” or allowing “bad news to travel slowly.”

6. How would you describe the risk management function’s relationship with the various business units in your company today? How has it evolved? What challenges remain?

The relationship is sound and based on mutual respect. We try to be seen as a partner to the business that has their best interests at heart but who, like a doctor, sometimes has to deliver messages that the “patient” does not want to hear, even though it has to be done!

7. What risks get the most attention and why?

This varies over time as we reassess the key risks faced by the organization each quarter and rank them both by estimated impact and probability so as to prioritize where management should focus their attention on the risks that need to be managed—in

the last two years the focus for us could be characterized as swinging from investment market risk and governance issues back to reputation risk and increasing insurance market risk.

8. Creating a risk culture is part of the enterprise risk management process. Describe where your company is in the process and what are some of the biggest challenges?

We have begun this journey but I see this as the biggest challenge in the role. In some ways this job will probably never be finished because it requires continued care and attention as the risks and circumstances of the business change (M&A, etc).

9. What functions are included in your portfolio of risk management responsibilities?

Insurance product pricing policy, insurance liability advice to the board (independent of management), asset & liability management, R&D, internal audit, fraud, physical security and compliance.

10. Do you have a risk policy and, if so, what was your process for setting it up?

We have a comprehensive risk management statement that is reviewed annually and endorsed by the board for formal submission to our prudential regulator—APRA. This document sets out our key risk policies and processes.

11. What are some of the main regulatory guidelines you need to be cognizant of in performing your duties as CRO or to what extent does the Sarbanes-Oxley Act help to shape the development of risk policies for your company?

Sarbanes-Oxley is not relevant to our company. However, we do follow the principles of the COSO ERM framework and have onerous Australian stock exchange requirements, prudential risk management standards and consumer protection legislation and regulations, with which we must comply.

12. Discuss the risk governance structure at your company. To whom do you report? Do you have board-level reporting? Is there an Executive Management Risk Committee?

I report to the CEO. I also have direct access to the main board of the parent company and key subsidiary company boards. At the board level, we

“

The number one challenge is creating a genuine culture and shared vision across the organization so that each of our 11,000 people will proactively manage risks in the same way without ‘shooting messengers’ or allowing ‘bad news to travel slowly.’

”

have an independent chairman (not the CEO) and we have an audit committee and a separate risk management & compliance committee (RMCC), both chaired by independent directors. At management level, we have three key committees that meet monthly and are devoted to risk issues all chaired by the CEO (an asset & liability committee, an underwriting and pricing policy committee and a reputation committee).

13. What type of reporting is routinely done? What's your vision for the future as it relates to risk position reporting?

Monthly reporting to the group monthly performance management meeting (chaired by the CEO) with an identical copy of that report provided monthly to the main board RMCC (see above). All risks can be classified by importance and all "key" risks note the name of the responsible executive and a date by which action has to be taken.

14. What qualifications does someone need to function as a risk professional in your department?

Generally people need either actuarial or accounting qualifications, although we also have a few with legal backgrounds.

15. What do you see as the future importance and prospects for the office of the CRO?

The CRO role will increase in importance as it becomes viewed more and more as a key contributor to corporate value through the protection of a company's reputation and has the ability to prospectively prevent or "head-off" problems before they become big issues.

16. How does your ERM function help protect or enhance shareholder value, minimize operational risk and ensure solvency?

It does in many ways. They are too numerous to mention in a summary such as this.

17. What do you see as the most important tools you need to be effective in your role?

It is important to have credibility and the confidence of senior managers of the business so that they will take notice of issues raised. It is also important to be seen as adding value to the business

rather than just always taking a reactive, conservative or preventative stance.

Risk management is not just about downside—it is also about maximizing opportunities and pointing out where under-performance can be improved.

18. How did your skills and experience as an actuary position you to earn the CRO title?

The quantitative skills derived from actuarial training and the "control cycle" concept help an actuary in a CRO role. The skills most actuaries don't have that assist in a CRO role involve an understanding of internal audit and control concepts and qualitative principles of risk management.

19. What advice would you give to other actuaries who aspire to be CROs?

Ask the question "what-if?" more often at the right time and stay abreast of issues outside your normal area of competence that could impact your employer's or client's operations.

An Interview with Beverly S. Margolian, FSA, FCIA, BCOM – Manulife Financial



Beverly S. Margolian is executive vice president and CRO, responsible for all aspects of Manulife Financial's risk management programs worldwide, including programs related to credit risk, market and asset liability risk, product and underwriting risk, as well as operational risks.

“

The skills most actuaries don't have that assist in a CRO role involve an understanding of internal audit and control concepts and qualitative principles of risk management.

”

continued on page 10 ▶

Chief Risk Officer — The New Domain for Actuaries

► continued from page 9

She chairs Manulife's Corporate Risk Management Committee, Global Asset Liability Committee and Product Risk Committee. She also sits on the Credit Committee and is a member of the company's Management Committee. She is a member of the Board of Directors of John Hancock Life Insurance Company.

Margolian joined Manulife in 1979 and has held several actuarial and financial management positions, including roles in many of Manulife's operating divisions. Prior to her appointment as CRO in 2001, she was senior vice president and corporate controller. In that role she heavily participated in Manulife's demutualization initiative.

She received her Bachelor of Commerce degree from the University of Toronto, and is a Fellow of the Canadian Institute of Actuaries and the Society of Actuaries. She has participated on a variety of industry and professional committees and is currently a member of the Society of Actuaries' Risk Management Section Council.

Let's look at her responses to our interview questions:

1. It is clear that risk management is a much more important topic at your company today than several years ago. What do you see as the primary motivations for elevating the enterprise risk management function in your company?

Manulife Financial is in the business of taking risks to generate profitable growth. How effectively we manage these risks is critically important to meeting the expectations of our key stakeholders and to safeguarding our reputation and our capital.

Risk management has been ingrained as part of our culture globally for a long time. Manulife appointed their first CRO in 2001 and we formalized our enterprise risk management function at that time. In fact, this was a natural next step in the evolution of our risk management practices. It has allowed us to bring all our risk management programs under one umbrella and has provided a focused set of resources to help enable the board, CEO and executive management

to shape risk policy, guide risk-taking activity, monitor key risk exposures and champion the strategic development of our risk management capabilities. We believe this could provide us a competitive advantage, allow to us better meet the increasing expectations of our key stakeholders and proactively manage the increasing complexity arising from external sources, as well as our own business operations.

2. Who has sponsored the initiative?

The establishment of the new function was sponsored by the CEO and CFO and was widely supported by the board and executive management.

3. How does your experience make the transition into this position easier? What gaps have you recognized?

My educational background and work experience allowed me to move into this position with ease. As a qualified actuary, I had gained extensive experience in many areas related to risk and financial management, covering both the investments and insurance side of the business. I also had a very good understanding of the market and regulatory environments in which we operate. I believe this background is one of the best for a life insurance company CRO. Of course, as CRO I have accountabilities that extend beyond the traditional actuarial roles, such as credit risk management and operational risk management. However, I have found that the gaps in knowledge related to these areas were not large and could be closed by selecting the right team of risk professionals to work with.

4. What is the mission statement of the office of the CRO in your company?

The fundamental objective of our risk management program is to support shareholder value growth while ensuring commitments to customers are met and reputation and capital are protected.

The mission of the office of the CRO is to ensure our enterprise risk management program effectively guides all risk-taking activities globally, ensuring they are aligned with corporate philosophy; taking risks that are prudent in relation to our capital strength, meet corporate ethical standards, that are diversified across risk types, businesses and geographies and for which appropriate compensation is earned.

“

Risk management has been ingrained as part of our culture globally for a long time...In fact, this was a natural next step in the evolution of our risk management practices.

”

5. What do you see as your number one challenge as CRO?

As CRO, my number one challenge is to help management to maintain the right balance between risk and opportunity. My mandate is not to ensure we take no risk on. It is to make sure we understand and have assessed the risks we are taking on in a rigorous manner, and that we ensure we get compensated appropriately for taking on the risk. No amount of risk models and metrics can take the place of strong business managers who understand the risks inherent in their businesses. We must provide the framework and tools to help them manage risk, and effectively champion new risk management techniques and processes throughout the organization.

6. How would you describe the risk management function's relationship with the various business units in your company today? How has it evolved? What challenges remain?

Our corporate risk management group works in partnership with the various business units. Although our operations are diverse geographically and by line, we have always had a strong corporate center of influence. A critical function of the corporate risk management group is risk policy and oversight, but we do this in working alongside the various business units. We can invest in new risk management R&D that they could not afford on their own, but benefit from it as a collective group. The biggest challenge for all of us collectively is to resource dollars and people and be able to move forward on all the initiatives we would like to.

7. What risks get the most attention and why?

There are no one or two risks that get the most attention. Our risk management practices are robust and we have been managing all risks for some time. Our reputation is one of our most valuable assets, and in today's environment of increasing scrutiny by stake holders, it is vital that it be safeguarded. The potential impact on our reputation is thoughtfully considered in every transaction, initiative or operating procedure. On the financial side, market and credit risks also get a lot of attention as the external environment can be very volatile and we must proactively manage positions. Corporate governance,

communication of corporate values and risk policies and our integrated approach to managing risk, capital and business objectives sets the foundation for mitigating all financial, strategic and operational risks.

8. Creating a risk culture is part of the enterprise risk management process. Describe where your company is in the process and what some of the biggest challenges are.

Manulife has always had a very strong risk culture and, for us, this hasn't been part of the challenge in implementing our enterprise risk management program. Risk management is not seen as a separate and distinct process, but a natural part of all our business and operational processes.

9. What functions are included in your portfolio of risk management responsibilities?

At Manulife, the CRO is responsible for managing the overall enterprise risk management program, and that covers all financial and operational risks. Specific portfolios, such as legal and compliance, are the direct accountability of the general counsel, and certain operational risks such as business continuity and information security are the direct responsibility of our Chief Administrative Officer (CAO). I work with our general counsel and CAO in these areas. As CRO, I have direct accountability to oversee our credit, market and asset liability and product risk management programs as well as oversee all our corporate insurance risk mitigation programs.

10. Do you have a risk policy, and if so, what was your process for setting it up?

We have an enterprise risk policy and this was developed to put an umbrella over all our existing risk policies. As CRO, I championed its development and approval. The policy went through a number of iterations as it was reviewed and eventually approved by our Executive Risk Committee and our Board's Audit and Risk Management Committee. The policy covers four cornerstones: risk governance, risk management processes, risk exposure measurement and risk limit management. It also includes our company's general risk philosophy.

“

Risk management is not seen as a separate and distinct process, but a natural part of all our business and operational processes.

”

continued on page 12 ■

Chief Risk Officer — The New Domain for Actuaries

▸ continued from page 11

11. What are some of the main regulatory guidelines you need to be cognizant of in performing your duties as CRO, or to what extent does the Sarbanes-Oxley Act help to shape the development of risk policies for your company?

Manulife operates in many countries and has a full array of product and service offerings, so we must be on top of a wide range of regulatory guidelines, and we have a global compliance program that ensures this is done effectively. The SEC and OSC are our primary securities regulators in North America. We also have a host of insurance regulations and accounting and actuarial standards to comply with. SOX 404 is one of the most significant and onerous regulations we are currently dealing with. As CRO, my mandate is to ensure that we have effective risk management policies and practices, and while expectations of regulators are an influence, the policies and practices are shaped more by our own fundamental objectives.

12. Discuss the risk governance structure at your company. To whom do you report? Do you have board-level reporting? Is there an Executive Management Risk Committee?

As CRO, I report to the CFO. We have established a Corporate Risk Management Committee that I chair, comprised of all general managers and key corporate executives. This committee has a mandate to approve risk management policies, review risk exposures and provide oversight and strategic direction related to risk management. In addition we have a Product Risk Committee and Global Asset Liability Committee, each of which I chair, and a Credit Committee, which the chief financial officer chairs. The Audit and Risk Management Committee of the board, along with the Conduct Review and Ethics Committee, oversee global risk management. These committees approve and monitor compliance with key risk policies and limits, and regularly review trends in material risk exposures, major risk-taking activities and the ongoing effectiveness of risk management practices. Each quarter I present two regular reports to both the Corporate Risk Management Committee and the Board's Audit and Risk Management Committee for review: a risk position report and a risk policy

compliance report. In addition, periodically key risk management programs are reviewed in more detail with the committees.

13. What type of reporting is routinely done? What's your vision for the future as it relates to risk position reporting?

There is a multitude of risk reporting done for various levels of risk committees and management. The risk position report that is presented to our executive risk committee and Board Audit and Risk Management Committee focuses on the most material exposures and gives a fairly detailed accounting of the exposure and management actions. The report covers our full standard inventory of risks but highlights in detail only ones where management is focusing a heightened level of attention. The risk policy compliance report provides sufficient detail to allow the committees to ensure all key policies and limits are being complied with.

Key risk indicators are reported on for various types of risk exposures. As we fully introduce new common risk exposure metrics, such as economic capital, we will begin to focus more on these measures as well. The reporting should allow management to understand the profile of the company's risks and concentrations and also ensure that the company is being appropriately compensated for taking on these risks.

14. What qualifications does someone need to function as a risk professional in your department?

The Corporate Risk Management Group is responsible for a wide range of risk management programs, so naturally, the team includes professionals with varied skill sets and experience backgrounds. We have resources with actuarial and investment backgrounds, with PhD mathematics backgrounds, MBAs and accounting backgrounds. I believe that a CRO needs to build a team with a complementary set of skills and experiences that will work together in partnership. However, as the world becomes more complex and the risk measurement tools become more sophisticated, people with strong quantitative skills, together with good business judgement, will be the kind of resources we will look for.

“

As CRO, my mandate is to ensure that we have effective risk management policies and practices, and while expectations of regulators are an influence, the policies and practices are shaped more by our own fundamental objectives.

”

15. What do you see as the future importance and prospects for the Office of the CRO?

In 2001, when I took the role of CRO and established the corporate risk management function, which included our centralized asset liability management function, we had about 15 people. Four years later, the group now includes about 50 people. A few groups were amalgamated and we have hired and added functionality primarily focused on risk management R&D to close gaps in a few areas. The importance of risk management and the CRO role is well recognized. It's not a "flavor of the month." If the function adds value for the businesses, and meets its objectives, it will only continue to grow in importance. Our risk management program is a constant work in progress, and it will continue to evolve and grow. Expectations of stakeholders are constantly changing. Our business, and the external environment in which we operate, will continue to get more complex. Risk management practices will need to change and grow with the times, and it is up to the CRO to ensure that this happens.

16. How does your ERM function help protect or enhance shareholder value, minimize operational risk and ensure solvency?

Our ERM framework is an integral component of our business management processes. Risk management, capital management, financial management, performance measurement—they are all linked and consistent. The risk management piece provides management with the proper tools and processes to assess risk and risk-adjusted returns, allowing them to make the most informed business decisions. We believe this will allow management to make decisions that will further enhance shareholder value and ensure solvency. Our ERM framework also ensures reputation risk, and all operational risks are considered in any business decisions.

17. What do you see as the most important tools you need to be effective in your role?

To be effective as a CRO of a life insurance company, you need to have a good blend of quantitative and analytical skills, but more importantly, you need to have very strong communication and people skills and good business judgement. As CRO, you are part of the senior executive team

and must be able to be effective on that team. On the other hand, for any CRO to be effective, they need the strong support of the CEO, and to be given an equal seat at the table.

With all that in hand, the CRO needs to be able to work within the culture and organization structure of their company to build or enhance the risk management practice. This means establishing the appropriate governance processes, ensuring the right resources are in place, developing the most appropriate risk measurement tools and reporting mechanisms to communicate these effectively. Most importantly they need to make sure that the risk management programs are not separate or distinct but form a natural part of all business decisions and operational processes.

18. How did your skills and experience as an actuary position you to earn the CRO title?

Answered above.

19. What advice would you give to other actuaries who aspire to be CROs?

The role of CRO is one of the most interesting and rewarding roles I have taken on. Actuaries, with the appropriate experience base, are most uniquely suited to be effective life insurance company CROs. Anyone who aspires to become a CRO or any other senior executive, needs to ensure they get a well-rounded set of work experiences and put themselves into positions where they can develop the skills needed to be a senior executive. Varying your career choices along the way, working in a variety of different areas—some traditional actuarial and some nontraditional roles—will give you a better perspective and make you a more valuable executive.

“

...as the world becomes more complex and the risk measurement tools become more sophisticated, people with strong quantitative skills, together with good business judgment, will be the kind of resources we will look for.

”

continued on page 14 ■

Chief Risk Officer — The New Domain for Actuaries

▶ continued from page 13

An Interview with Craig R. Raymond, FSA, MAAA, BS — Hartford Financial Services Group



Craig R. Raymond is senior vice president and CRO for the Hartford Financial Services Group, Inc., one of the nation's largest insurance and financial services companies. As CRO, Raymond heads the Enterprise Risk Management function for The Hartford. In this role, he directs the efforts to enhance The Hartford's risk management functions and chairs the Enterprise Risk Committee. Additionally, Raymond is head of strategic development for The Hartford and has responsibility for all merger and acquisition activities.

Raymond joined The Hartford as a life actuarial student in 1985. In his 20 years, he has held a range of roles in the life operations. Most recently, he served 10 years as chief actuary of Hartford Life, prior to moving into his current position in 2004.

As a Fellow of the SOA and a member of the AAA, Raymond has volunteered his professional expertise to numerous committees, including serving a two-year term as vice president of the SOA, and is a frequent speaker at industry meetings.

Raymond is a graduate of the Wharton School of the University of Pennsylvania.

Let's look at his responses to our interview questions:

1. It is clear that risk management is a much more important topic at your company today than several years ago. What do you see as the primary motivations for elevating the enterprise risk management function in your company?

At The Hartford, the motivation for formalizing an ERM function was primarily driven by the recognition that there are events, such as terrorist attacks, that present financial risk across the breadth of product lines in the organization. We generally value the diversification that our mix of life and property and casualty businesses provides, but these risks are not totally uncorrelated. An enterprise-level function is the only effective way to understand and manage the implications of these types of risks.

2. Who has sponsored the initiative?

This was driven from the top, starting with the chairman.

3. How does your experience make the transition into this position easier, and what gaps have you recognized?

I moved into this position after 10 years as the chief actuary of our life company. My knowledge of the organization—the people, the businesses, the information flows, the way we get things done—was critical in creating a new role that could be accepted and could create an impact in a short period of time. Due to the breadth of this role, anyone entering it will have gaps in their experience. For me, understanding the P&C business and operational risk in general are new challenges. Developing a communication strategy and approach to the board of directors is also breaking new ground.

4. What is the mission statement of the office of the CRO in your company?

The mission of ERM is to create a consistent framework for understanding, evaluating, reporting on and decision-making on risk throughout the enterprise. Business managers have ownership of and responsibility for managing risk. ERM's role is to ensure that informed, consistent decisions on risk are being made. More informed risk taking enables the enterprise to expand its appetite for risk.

“

To be effective as a CRO of a life insurance company, you need to have a good blend of quantitative and analytic skills, but more importantly, you need to have very strong communication and people skills and good business judgment.

”

5. What do you see as your number one challenge as CRO?

Prioritizing. There is so much that we want to accomplish and everything is important. Determining the most effective way to use limited resources to create an impact in the short term is my biggest challenge.

6. How would you describe the risk management function's relationship with the various business units in your company today? How has it evolved? What challenges remain?

Risk management has long been very ingrained in the operations of our businesses. I work very closely with existing staff, in each of the businesses having existing risk management responsibilities. In fact, we formalized this structure by naming individuals with key existing risk management roles in each of our major businesses units CROs of their units. These unit CROs are the key members of my ERM team. As we broaden the range of risks we are looking at, we will need to continue to tap into key resources throughout the organization.

7. What risks get the most attention and why?

Our initial focus is on risks that either impact multiple business lines across the enterprise or present a significant financial risk to the enterprise as a whole. We have very robust existing risk management processes within each of the operating units, so our focus is on those areas that need to be managed at the enterprise level.

8. Creating a risk culture is part of the enterprise risk management process. Describe where your company is in the process and what some of the biggest challenges are.

I am fortunate to work in an organization that has always had a very strong risk culture. I actually have found that one of my biggest challenges is to get business managers to understand that the role of the ERM function is not to take away their responsibility for risk management, but rather to enable them to be more effective in their role as risk managers.

9. What functions are included in your portfolio of risk management responsibilities?

The ERM function includes all aspects of risk. This includes the determination of internal economic capital measures, product pricing review and reinsurance oversight.

10. Do you have a risk policy, and if so, what was your process for setting it up?

We are in the process of formalizing a risk policy. My staff has direct responsibility for developing and drafting this policy in cooperation with the business units. I chair an Enterprise Risk Committee that has responsibility for adopting risk policy. This committee includes the president and his direct reports along with key risk staff from the operating units.

11. What are some of the main regulatory guidelines you need to be cognizant of in performing your duties as CRO, or to what extent does the Sarbanes-Oxley Act help to shape the development of risk policies for your company?

Our approach to ERM separates responsibility for compliance and audit functions from ERM. From the CRO's point of view, I need to gain comfort with these functions and evaluate areas of risk that fall outside their work. SOX actually helps with this work in formalizing financial control processes in a way that allows me to start at a high comfort level.

12. Discuss the risk governance structure at your company. To whom do you report? Do you have board-level reporting? Is there an Executive Management Risk Committee?

I report to the CFO and have direct responsibility for reporting on risk to the board of directors on a regular basis. We have a senior-level Enterprise Risk Committee that I chair.

“

The mission of ERM is to create a consistent framework for understanding, evaluating, reporting on and decision-making on risk throughout the enterprise.

”

continued on page 16 ▶

Chief Risk Officer — The New Domain for Actuaries

▶ continued from page 15

13. What type of reporting is routinely done? What's your vision for the future as it relates to risk position reporting?

There currently exists a vast array of reporting on risk throughout the organization. We provide ERM reporting to the board as a regular part of each board package. We are in the process of introducing a series of reports that will provide metrics on each key risk area. I expect this to be a constantly developing package.

14. What qualifications does someone need to function as a risk professional in your department?

Expertise in a specific area of risk or risk management is a given. Most critical is the ability to work effectively and cooperatively with professionals across the organization. Communication and team building skills are essential.

15. What do you see as the future importance and prospects for the office of the CRO?

I am very excited about the potential for where this role can go. We have our hands full now just laying the groundwork for understanding and reporting on risk. The real value of this role will be more fully appreciated once this groundwork is in place. Enabling the organization to expand our ability to take risk is where this value will have the biggest impact long term.

16. How does your ERM function help protect or enhance shareholder value, minimize operational risk and ensure solvency?

By creating a common framework for evaluating risk, we have consistent risk/return metrics across the enterprise. This allows effective decision making around the use of capital throughout the organization. We also ensure that we have appropriately evaluated any risks to solvency and have processes to manage these risks and the capital needs associated with them in place.

17. What do you see as the most important tools you need to be effective in your role?

Communication skills cannot be undervalued in the CRO role. The CRO needs to have the business and analytical sense to understand and evaluate risks, but the ability to translate the implications of risk and the risk management processes to a broad audience is essential to being effective.

18. How did your skills and experience as an actuary position you to earn the CRO title?

As the chief actuary of our life company, I really had been operating as the CRO for the life business for a number of years. An effective actuary should see their role as including much of what the CRO does. Understanding and evaluating risk and communicating its implications are at the core of what an actuary does.

19. What advice would you give to other actuaries who aspire to be CROs?

Actuarial training is a great background for this type of role, but be open-minded in learning about how other disciplines think about and evaluate risk. Having the knowledge and skills to bridge the gaps between the many disciplines involved in managing risk will open up doors to broader risk management opportunities. ♦

“

By creating a common framework for evaluating risk, we have consistent risk/return metrics across the enterprise. This allows effective decision making around the use of capital throughout the organization.

”

Articles Needed for *Risk Management*

Your help and participation is needed and welcomed. All articles will include a by-line to give you full credit for your effort. If you would like to submit an article, please contact Ken Seng Tan, editor, at kstan@uwaterloo.ca.

The next issue of *Risk Management* will be published:

<i>Publication Date</i>	<i>Submission Deadline</i>
November 2005	August 15, 2005

Preferred Format

In order to efficiently handle articles, please use the following format when submitting articles:

Please e-mail your articles as attachments in either MS Word (.doc) or Simple Text (.txt) files. We are able to convert most PC-compatible software packages. Headlines are typed upper and lower case. Please use a 10-point Times New Roman font for the body text. Carriage returns are put in only at the end of paragraphs. The right-hand margin is not justified.

If you must submit articles in another manner, please call Joe Adduci, (847) 706-3548, at the Society of Actuaries for help.

Please send an electronic copy of the article to:

Dr. Ken Seng Tan, ASA, Ph.D.
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1
phone: (519) 888-4567 ext. 6688
fax: (519) 746-1875
e-mail: kstan@uwaterloo.ca

Thank you for your help.

The 3rd Annual Premier Global Event on ERM...Where Cutting-Edge Theory Meets State-of-the-Art Practice

Contributors: Mark Abbott, Hubert B. Mueller, Max Rudolph, Fred Tavan, David L. Ruhm, John J. Kollar, David N. Ingram and Sim Segal

Over 500 risk management professionals participated in the 2005 ERM Symposium, held in Chicago on May 2-3 2005. The symposium featured six general sessions with presentations from Bob Stein, James Lam, Nassim Taleb, Leslie Rahl, Bennett Stewart, Prakash Shimpi, Harry Panjer, Chris Duncan, Shyam Venkat, Steve Manning, Robin Lenna, Larry Moews and Don Watson. The meeting also offered over 30 concurrent presentations from over 100 enterprise risk management practitioners. Here are summaries of a sampling of those sessions.



Mark C. Abbott, PRM, is managing director and head of investment risk management and quantitative research for Guardian Life. He can be reached at mark_abbott@glic.com.



Hubert B. Mueller, FSA, MAAA, is a principal with Towers Perrin in Weatogue, Conn. He can be reached at Hubert.Mueller@towersperrin.com.

General Session 1: Frontline Briefing on ERM

David Ingram, Insurance Enterprise Risk Management, Standard & Poor's, introduced the session and speakers by asking that attendees open their eyes and minds to look at risk from different perspectives and challenge their existing conventions and conceptions.

James Lam, president, James Lam & Associates, provided wise guidelines and ways to successfully change culture to adopt and use risk management to help align interests, the importance of buy-in and credibility and how risk dashboards can help provide transparency and a self correcting process.

Robert Stein, chairman, Global Financial Services, Ernst & Young, framed ERM, suggested objectives and benefits, reviewed implementation challenges and leading practices and discussed making it work with effective risk governance.

General Session 2: Current Thinking on Risk Management: Not Fooled By Randomness

Shaun Wang, director of the actuarial science program, Risk Management & Insurance

Department, Georgia State University, introduced the need to define and evolve ERM frameworks beyond the silos that exist, involving both practitioners and academic thinkers to build the theoretical foundation for this new discipline.

Nassim Taleb, author, *Foiled by Randomness* stressed that we need to discard our Gaussian views and look at alternative risk measures for such processes where the outliers contain all the information.

Leslie Rahl, president, Capital Market Advisors, Inc. expanded on the galaxy of risks and the importance of valuations.

General Session 3: Proper Alignment of Senior Management Measures and Incentives

Mark Abbott, managing director of risk management and quantitative research at Guardian Life, and a PRMIA board member, introduced Bennett Stewart and suggested that arguments such as Bennett's should help move senior management away from traditional accounting performance measures, like ROE, and more toward economic measures, like EVA.

Bennett Stewart, senior partner, Stewart Stern & Co., discussed common pitfalls from several case studies that identified earnings that may be manipulated by management as a poor management performance metric. He went on to highlight that increasing transparency and offering more frequent financial reporting in the absence of earnings guidance actually decreased stock price volatility. He proposed that to optimally manage businesses, an alignment of management performance measures was needed, and suggested that EVA could help achieve such. He also proposed that incentive caps could actually destroy value. His conclusion was that effective performance measures are

essential to balancing risk and reward—the competing interests among shareholders, customers, executive management and all employees in order to achieving optimal growth in long-term firm value.

General Session 5: CRO Forum

Shyam Venkat, partner of PwC, led the General Session CRO Forum, which was an outstanding senior insurance risk management practitioner panel, on the second morning of the event. This diverse panel of renowned insurance CROs included: Robin Lenna, CRO, Met Life; Steve Manning, Head of Risk Management, Lloyd's of London; Larry Moews, CRO, Allstate; and Don Watson, CRO, Ace. They discussed how they championed, established and executed development of ERM frameworks in their organizations. They compared organizational structures/committees, objectives, roles, current achievements, goals and priorities. All voiced increasing demands expected of them by their board, CEO and other parties, such as regulators, rating agencies, analysts, etc. A common thread was that the risk management process, and improved senior management communication around risk management, was being recognized as a critical competitive advantage.

General Session 6: Concluding Remarks/ Ask The Experts

Dave Koenig, chair, PRMIA, introduced the experts who gave closing remarks and answered questions. Joining him were Ed Dumas, senior vice president and CRO, Federal Home Loan Bank of Boston; Bill Panning, Executive vice president and managing director, Willis Re, Inc; and Erwin Martens, senior vice president and CRO, TIAA-CREF. Martens remarked that the CRO role had expanded to include much more than market, credit and operational risk and now includes security and business continuity. Panning wanted to develop better ERM models that could be used to understand the interactions to improve management discussion. Dumas contrasted the banking perspectives on ERM. The audience, which still included many of the speakers, asked several challenging questions and the panel responded with excellent responses and concluded that there were

many remaining issues to address at future ERM Symposiums.

Workshop Session 3: ERM Tools & Techniques – The Building Blocks

Presenters: Fred Tavan (*RGA International*) and Max Rudolph (*Mutual of Omaha*)

This workshop provided practical tools and techniques needed to get an ERM program off the ground. Fred Tavan first presented practical ERM tools that could be used to assess all risks within a risk management framework. He gave examples of various risk metrics that could be used in the measurement of risk. Tavan also provided an introduction to the concepts of risk appetite, tolerance, limits, triggers and early warning indicators. Max Rudolph focused on the measurement of various financial risks and provided examples on the importance of these to the overall risk profile of a company.



Concurrent Session A2: Creation of Value Through ERM

Moderator: Sim Segal (*Deloitte Consulting*)
Presenters: Sim Segal (*Deloitte Consulting*), Jose Renator Carollo (*Carollo Consulting*), and Robert Kopech (*Mercer Oliver Wyman*)

Sim Segal discussed how a value-based ERM approach can make a clear and quantifiable business case for ERM and how this approach is being used to improve shareholder value. He illustrated how a value-based ERM model quantifies the enterprise-wide correlated impact of risks on shareholder value. Segal also described how the common “language” of shareholder value unifies otherwise disparate ERM processes.

Jose Renato Carollo discussed the mechanism that creates value through risk management, the consolidation of different risk types and the RAROC approach through two different



Max Rudolph, FSA, MAAA, is vice president and actuary with Mutual of Omaha Insurance Company in Omaha, Neb. He can be reached at max.rudolph@mutualofomaha.com.

continued on page 20 ►

“

While there are still limitations as to the acceptance of company models, Fitch is open to considering company-specific models in the determination of EC.

”



Fred Tavan, FSA, FCIA, is vice president with RGA International, Ltd in Toronto, Ontario. He can be reached at ftvan@genre.com.

David L. Ruhm, FCAS, is assistant vice president with The Hartford Financial Services Group in Hartford, Conn. He can be reached at David.Ruhm@TheHartford.com.

2005 Enterprise Risk Management Symposium

▶ continued from page 19

perspectives: ex-ante capital allocation and ex-post performance measurement.

Robert Kopech discussed orienting ERM efforts to strategic and tactical decision-making aimed at optimizing value for business segments and the enterprise, and contrasted this with traditional applications which focus on compliance and exhaustive delineation of risk types. Kopech described how firms can reorient themselves to actually measuring and managing risk and employ a portfolio management approach to capital allocation and shareholder value optimization.

CS B1: Economic Capital vs. Rating Agency Capital vs. Regulatory Capital

Moderator: Hubert Mueller (*Towers Perrin*)

Presenters: Larry Bruning (*KS Insurance Dept*) Hubert Mueller and Peter Patrino (*Fitch Ratings*).

The first session on economic capital (EC) provided an outside-in perspective on EC. First, Hubert Mueller described current market trends for determining and using EC in the North American marketplace, using the results of several recent market surveys and a number of client assignments in this area. He is seeing a growing trend toward the use of EC in the marketplace, at a worldwide level. Next, Peter Patrino provided the rating agency perspective on insurance company capital models. While there are still some limitations as to the acceptance of company models, Fitch is open to considering company-specific models in the determination of EC. Last, Larry Bruning discussed regulatory views on risk-based capital (RBC), and how the current proposal for RBC on variable annuities (C-3 Phase II) is reshaping the industry's capital adequacy framework from a formula-based approach to a principles-based model, using company-specific stochastic modeling. All three speakers agreed that EC would be even more broadly used going forward, and is expected to become a key component of company's ERM methodologies.

CS B3: Economic Capital Recent Trends in Implementation

Moderator: Hubert Mueller (*Towers Perrin*)

Presenters: Doug Brooks (*CRO of Sun Life Financial*), Robin Lenna (*CRO of Met Life*) and Kevin Reimer (*Head of Risk Management for ING's Institutional Products Division*)

In this session, three chief risk officers from some of the largest insurance companies in North America discussed how the implementation of EC at their companies has helped them in risk management and business decision-making. Each speaker also discussed some of the motivations behind the implementation of EC at their companies. These include:

- Linking risk and value in a consistent framework—when using an embedded value framework, calculating EC allows a determination of the risk-adjusted value created;
- Finding a way to calculate and allocate the “right amount” of capital for non-financial (operational) risks, leveraging the knowledge available from the banking marketplace; and
- Optimizing the use of capital when working in different accounting regimes.

CS B5: Earnings at Risk and Practical Considerations in Developing a Risk Management System

Presenters: Jay Glacy and Cindy Sarna

ERM practitioners face a profusion of business complexity as they try to balance risk exposures with demands for earnings and share performance. Earnings-at-risk is a multi-period, multi-factor model of earnings emergence in the accounting domain. Earnings-at-risk can highlight the path to improved financial performance by permitting insurers to more confidently understand and control real-world financial risks.

Mounting business complexity creates a host of implementation challenges for the risk professional embarking on an earnings-at-risk build-out. The intricacies of GAAP and federal income tax (FIT) treatments, and the highly technical nature of today's insurance assets and liabilities, make for a difficult road. And, the technology challenges, both related to hardware and

software, can be intimidating. However, the determined developer will be rewarded with a reliable, firm grasp on risk and the means to thoughtfully mitigate exposures in a rigorous and relevant modeling framework.

CS C1: International and Cultural Issues in Enterprise Risk Management

Moderator: Donald Howard (*MetLife*)

Presenters: Thakor Desai (*Moore's Rowland International*) and Donald Howard (*MetLife*)

Case studies into ERM practices at four large companies in a variety of countries revealed an inconsistent understanding of ERM across insurance companies. Apparently, the most significant driver of ERM development has been regulations. However, inconsistency between the “design” and the “implementation” of ERM is high among companies. On the brighter side, there is a developing convergence between the “qualitative” and the “quantitative” phases of ERM. Looking forward, development of a common risk language will be important to develop a common risk culture. A consistent global framework of ERM is far in the future.

CS C5: ERM in Asset Management

Moderator: Mark Abbott (*Guardian Life & PRMIA Board Member*)

Presenters: Erwin Martens (*TIAA-CREF*), Lars Toomre (*Toomre Capital Markets*) and Jun Zhou, (*AIG*)

The panelists presented very different introductions. Erwin Martens talked about the roles, tools and processes of a CRO, including the importance of informal discussion at all levels—detailed examples were covered. Lars Toomre first provided an overview of issues in asset management and then talked about the importance of a common vocabulary, the convergence of three primary capital markets sectors (assets, liabilities and liquidity) and the need for successful integration and management of ALL three areas to optimize enterprise value and EVA. Jun Zhou went through the importance of listening and understanding the problems and used recent ALM and variable annuity modeling as an example. An excellent discussion followed.

CS D1: Risk Tolerances and Risk Metrics

Moderator: Fred Tavan, (*RGA International*)

Presenters: Richard Goldfarb (*E&Y*), Fred Tavan, (*RGA International*) and David Ruhm, (*The Hartford Insurance Group*)

This session included various topics around risk tolerances and risk metrics. Fred Tavan spoke about various risk metrics that can be used for each of the risk subcategories in the AAA risk management framework. He gave an introduction to “Fuzzy Logic” and provided many examples to help the audience get acquainted with this tool for operational risk measurement. Tavan also talked about the challenging issues around setting the risk appetite and tolerance levels in presenting relevant research by Kahneman and Tversky. Richard Goldfarb spoke about the technique of using credit ratings for setting risk tolerance in a company. Richard Ruhm provided the advantages and disadvantages of several well known risk metrics and introduced the audience to the Risk Coverage Ratio metric.

Risk metrics have evolved over the past several decades, successively addressing more meaningful questions about the extent of risk exposure and the risk/return tradeoff. Each risk metric addresses a specific question about risk and provides a piece of useful information, but has shortcomings that are specific to that metric. For example, the Sharpe ratio provides useful insight into the risk/return tradeoff but gives little information about the sizes of the most extreme events, while the conditional tail expectation (CTE) can indicate how much capital is necessary to survive an average catastrophe but doesn't say anything about the risk/return tradeoff. Several risk metrics can be used in combination to cover the various aspects of risk measurement and to obtain a more complete perspective for assessing and managing risk.

While risk metrics look different from each other in their formulations, nearly all of them come from answering the same small group of



John J. Kollar, FCAS, MAAA, is vice president with Insurance Services Office, Inc. in Jersey City, N.J. He can be reached at jkollar@iso.com.



David N. Ingram, FSA, MAAA, is director of enterprise risk management with Standard & Poor's in New York, N.Y. He can be reached at david_ingram@standardandpoors.com.

continued on page 22 ►

2005 Enterprise Risk Management Symposium

▶ continued from page 21

questions. Different combinations of answers to these key questions lead to the broad variety of risk metrics.

CS D6: Topics in Risk Identification and Risk Measurement for Insurers

Moderator: John Kollar (*ISO*)

Presenters: Dave Ingram (*Standard & Poors*), John Kollar (*ISO*) and Marilyn Schlein Kramer (*DxCG*)

John Kollar (*ISO*) described how a property/casualty insurer could measure its underwriting risk by including loss volatility, loss reserve risk and correlations. This measurement would allow the insurer to calculate implied capital, allocate capital, optimize reinsurance, set combined ratio targets for pricing, reflect pricing risk, plan growth and provide robust risk analyses for its board, rating agencies, stock analysts and regulators. Dave Ingram (*Standard & Poors*) presented an analysis of mortality risk including the impact of random fluctuations in mortality, mis-estimation of claim levels, mis-estimation of trends that are not smooth and catastrophes. He also reported on the risk transfer securitization of mortality risk using mortality bonds. Marilyn Schlein Kramer described how health predictive models may be used to normalize insured populations for chronic conditions and acute illnesses (risk adjustment), for purposes of making risk transfer payments, and assisting payors (employers), health care providers and health plans provide and manage health care. She also described a study of how health predictive models may be used to identify high-cost workers compensation claimants. The panelists concluded with a summary of commonalities and differences across the three insurance lines.



Sim Segal, FSA, MAAA, is senior manager in Deloitte Consulting's Actuarial & Insurance Solutions practice. He can be reached at sisegal@deloitte.com.

“
... chip makers did not anticipate the popularity of the iPod and had to adjust on the fly.
”

CS E3: Do Risk Professionals Have What It Takes to Manage Assets?

Moderator: Stephen Paul Hodges (*Nationwide Financial*)

Presenter: Max Rudolph (*Mutual of Omaha*)

The risk professional is often the only person in a company who thinks about assets and liabilities in equal proportions. So why do most people in this position of knowledge continue to use investment professionals to manage their personal assets? Max Rudolph presented the case that, while we have the right skill set to do the job, we often don't have the combination of time, interest or confidence to do so. Then he laid out various considerations for personal investing and developed tools to utilize a bottom-up, value-based methodology.

CS G1: Procurement Risk Management at HP: Applying Financial Engineering Techniques to Manage Risks in the Supply Chain

Moderator: Max Rudolph (*Mutual of Omaha*)

Presenter: Venu Nagali (*Hewlett-Packard Company*)

Most of the presenters at the 2005 ERM Symposium discussed financial risks. Venu Nagali shared his success applying financial engineering tools in a manufacturing setting. There are only a few major producers, and only a few major buyers, of DRAM chips. Currency risks (supply is almost exclusively from Taiwan) are combined with demand uncertainties, volatile memory prices and rapidly changing technology to make DRAM procurement a key driver of HP's bottom line. As a recent example, chip makers did not anticipate the popularity of the iPod and had to adjust on the fly. Dr. Nagali shared how HP has provided stability of cost and supply through structured contracts with suppliers, defining a fixed quantity and pricing terms.

Many of the presentation slides and audio files from the presentations are available on the Web at <http://www.ermssymposium.org/>

The ERM Symposium will be back next year, again in Chicago. Watch this space for more information. ♦

Credit Risk Survey Results

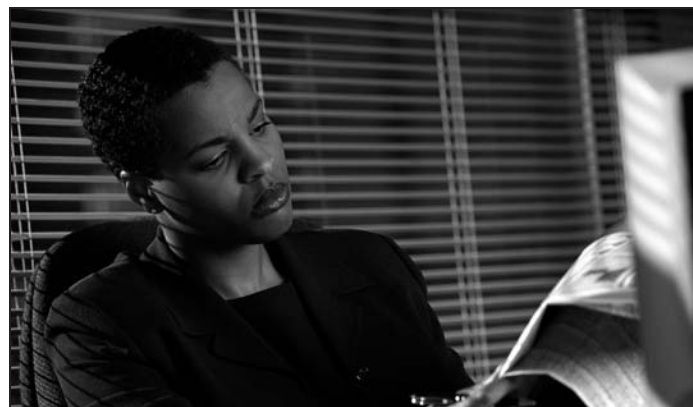
by Juan Kelly

During a three-week period last summer, the Credit Risk Listserv surveyed over 5,000 actuaries who are members of the Risk Management Section, the Investment Section and the Casualty Actuarial Society (CAS). Over 500 valid responses were received and tabulated by our long-standing vendor partner *www.perfectsurveys.com* (now *www.SurveyZ.com*). To put it mildly, the response was overwhelming (typical responses to a survey of professionals such as ourselves number no more than 250). I will share some of the highlights from the tabulations:

- Over 700 actuaries work with credit risk in their daily practices and will continue to do so.
- The relationship of credit risk to actuarial practice runs the gamut of the world economy, including swaps, default obligations, asset allocation, issuer concentration, reinsurance, surety bonds, moral hazard, ALM work, economic capital and VaR.
- Tools used to evaluate credit risk include both homegrown stochastic simulation models and proprietary models, rating agency reports, correlation studies of default and recovery rates, SOA private placement studies and RBC analysis.
- Resources at the disposal of actuaries measuring and evaluating credit risk include rating agency studies and models, the CFA syllabus, AIMR publications, *www.defaultrisk.com*, and syllabi offered by SOA, CAS, PRMIA and GARP.
- Credit risk is considered by actuaries in product pricing, dividend formulas, interest crediting rates, default swaps, VaR-like risk management calculations for asset losses and reinsurance recoverables.
- Areas where actuaries expect to add the most value in the future include portfolio simulation techniques, measuring credit worthiness of insurers and reinsurers, assessing suitability of credit instruments for investment portfolios, establishing issuer/industry/country/below investment-grade credit limits and analysis of derivative-like products.

Some responding actuaries felt that other professionals do a far better job of measuring and evaluating credit risk than our profession. It's not enough to be able to do the analysis. Credit risk management is crucial, especially when it comes to the valuation of insurance contracts in the era of fair value accounting.

Interestingly, only 400 of the respondents answered questions related to their employment status (e.g., working versus retired) and practice specialty. In balance, the responses are most gratifying. Rest assured that the SOA, CAS and the sections with interest in credit risk will take them to heart in the course of providing our profession with the tools and education to be successful. ♦



Juan Kelly, ASA, MAAA, EA, is senior actuarial associate with Mahoney & Associates in Fort Lauderdale, Fla. He can be reached at jnkelly@mahoneyandassociates.com.

Operational Risk Management

by Dorothy L. Andrews

What is operational risk? For a long time, many preferred to consider a risk an operational risk, if it could not be classified as a market risk, a credit risk, a strategic risk or a business risk. This definition did not survive for very long in the banking community, where the identification, quantification and mitigation of risk, is paramount to staying in business. In September 2001, the Basel Committee on Banking Supervision (BCBS) endorsed defining operational risk as “the risk of monetary losses resulting from inadequate or failed internal processes, people and systems, or from external events.” Risks arising from external events, such as natural disasters and terrorists’ acts, are difficult to mitigate and require catastrophic planning. However, these are low probability events. It is more likely that a business will suffer a loss in the near term as a result of events internal to its organization. The due diligence in an organization must be directed at installing infrastructure to minimize economic loss from internal operational inefficiencies.

Every organization’s first step toward mitigating operational risk must be the development of a risk policy. The advantage of a risk policy is it provides a framework for separating the personal interests of individuals from those activities that are in the best interest of an organization’s economic health. With a business-focused operational risk policy in place, the decision makers of an organization can be measured on how well their choices support the objectives of the business. This means the risk of self-promotion becomes mitigated under a balanced and well-focused risk policy. It is important to note that in a risk context, we say “mitigate” rather than “eliminate,” because risk cannot be eliminated totally and completely. At best, we are merely substituting one risk for a lesser of two evils, where the preferred risk has a lower probability of occurrence.

There are many examples in history where the absence of a risk policy led to the downfall of an enterprise. One of the most notable is the fall of Barings Bank of London. Nick Leeson was the general manager and head trader of Barings Futures (BFS), and as such he was in charge of

both the front office and the back office of BFS. His position violated a basic tenet of good risk management—separation of duties. Leeson had too much authority to approve and execute trades and he did so without supervision from a higher authority. Leeson traded in options, which he was not authorized to do, and he maintained positions overnight. He did not have authority to conduct this activity, either. In fact, Leeson consistently exercised more authority than he was granted, and he could get away with it because Barings did not have a system of procedures and controls in place to monitor his trading activity. When it was all over, the losses he amassed were in excess of £800 million (or US \$1.3 billion).

The collapse of Confederation Life is the result of a violation of another basic tenet of good risk management accountability. According to Rod McQueen in “Who Killed Confederation Life,” the board of directors did not hold senior management sufficiently accountable for their actions. The officers of the company were irresponsible in their work practices, paying no regard to policyholder interests. Because of the size of Confederation Life and its importance to the local economy, regulators were reluctant to react to early warning signs that the company could be headed for trouble. Local politicians were as reluctant to act as the regulators. Finally, the auditors failed to uncover a weakness in the financial statements of Confederation Life. They were 71 percent invested in real estate and no one thought this was a red flag. When it was all over, the cost of insolvency was in excess of \$2 billion, topping the losses incurred by Barings Bank of London. Obligations to many policyholders remain outstanding and over 4,000 jobs were lost.

A third notable collapse of a financial institution is that of Executive Life. Executive Life was near bankruptcy in 1974 when Fred Carr took the reigns of the company. The company was in short supply of capital and Carr had a plan to solve the problem. Carr was a risk taker and was known by many as a “gunslinger”—a reputation he earned as a stockbroker in the sixties, when the mutual fund market exploded. Well, he was



Dorothy L. Andrews, ASA, MAAA, is second vice president in risk management at Transamerica Reinsurance in Charlotte, N.C. She can be reached at Dorothy.andrews@transamerica.com.

no less cavalier at the helm of Executive Life. He violated the risk management principle of proper representation by projecting investment returns on Executive Life's interest-sensitive life insurance products, in extreme excess of those on competitor's products. To make plausible returns, he needed high-yielding investments to support the projections. Carr looked to the junk bond king, Michael Milken, for the solution. Carr and Milken erroneously assumed high yields would continue indefinitely. They were wrong. The capital needed to support the business began to outpace the capital they were able to raise, via the junk bond market, and in May of 1991, Executive Life was driven into bankruptcy. When it was all over, shareholders who stuck around lost their investments. Policyholders, fortunately, escaped with only few wounds.

There are plenty of other examples of organizations that we can analyze how the lack of a risk policy led to their collapse. These include Monarch Life, Sovereign Life, Arthur Andersen, Enron and many others. While the lessons of these failures are valuable in shaping future risk policy, they often come at the price of more governmental regulations to police corporate behavior. The ill-risk practices of a few are the reasons for the mounting pressure on many companies to operate profitably in an environment overburdened with federal, state and SEC regulations.

The second step in managing operational risk is the identification of the business functions in need of the most attention. In the business of insurance, two of the most important functions are performed by those bringing business in the door and by those who "meet and greet" the business data. Collectively, they are the "hunters and the gatherers." The remaining professionals upstream further prepare the data for consumption by management, who are empowered to make business decisions.

Reinsurers tend to have more data challenges than direct writers. The three biggest challenges they face regarding data are:

- 1) The lack of real-time access to policyholder data.
- 2) The heterogeneity of data formats across clients.
- 3) Inadequate communication of changes to data definitions.

In addition to these data challenges, reinsurers have the same issues with data quality as do direct writers.

The three data challenges just mentioned are each a source of operational risk to the financial statements of reinsurers. There can be a one or more month lag in the data reinsurers receive from their clients. This lag affects reserve calculations and the financial reporting of claims, making necessary certain assumptions to roll available data forward to the appropriate reporting period. In addition to the lag, there exists a lack of uniformity in the data formats of the data received from clients. Each client maintains an information technology (IT) system and reinsurers must build in-house IT platforms to accommodate each one. This can be a daunting undertaking made even more so when the communication of data definitional changes breaks down. When this happens, scarce resources must be allocated to resolve data conflicts, if financials are to present a clear picture of the financial health of the reinsurer and empower its management to make prudent business decisions.

Clearly, the decisions made by management can only be as good as the information they are fed by the hunters and the gatherers and the myriad of other upstream financial, legal, actuarial and information analysts. For this reason, everyone in an organization has the responsibility to improve the quality of data that management needs to decide the organization's future direction. A risk policy must address all those business functions that have initial and subsequent contact with data deemed important to economic health. One should ask, "Are controls in place to verify that the data received, in addition to being timely, correlates with what was sent according to the client? What infrastructure is in place to increase the correlation between reinsurer and client data to 100 percent? How complete is the analysis of the data? Have all possible risk contingencies been recognized?" An organization's answers to these questions can provide some insight as to its diligence in maintaining high-quality analytics and data and what is needed to begin the process of improving data quality. ♦

“

Clearly, the decisions made by management can only be as good as the information they are fed by the myriad of upstream financial, legal, actuarial and information analysts.

”

CIA 2006 Stochastic Modeling Symposium

April 3-4, 2006 Toronto, Ontario

This is a quick reminder that the Organizing Committee of the 2006 Stochastic Modeling Symposium has issued a Call for Papers and is still inviting academics, researchers and practitioners to indicate their interest in submitting papers. Although strong interest has already been expressed, the deadline to inform us of your intention to contribute has been extended to July 31, 2005. Final papers are still to be delivered by November 30, 2005.

The overall theme for the symposium will be “Practical Actuarial Applications of Stochastic Models.” The symposium and this Call for Papers will focus on the following three main topics as they apply to the world of insurance.

- Use of stochastic models in valuation of assets and liabilities
- Use of stochastic models in enterprise risk management
- Use of stochastic models in credit risk management

The symposium’s goal is to identify and promote leading-edge practical actuarial applications for stochastic modeling. The question we seek to answer is “How can we make use of stochastic modeling in our day-to-day work?”

Are you up to the challenge?

This Call for Papers is a critical component to the success of the symposium. Academics, researchers and practitioners are all encouraged to contribute papers in advance of the symposium. The Organizing Committee expects to publish accepted papers in a symposium proceeding and will also refer outstanding papers to the *North American Actuarial Journal*.

Cash prizes will be awarded for the best papers submitted in response to this Call.

Submission of papers

Please visit our Web site at www.actuaries.ca/meetings/stochasticsymposium_e.html to view the full Call for Papers document and all the details on how to submit your paper.

The 2006 Stochastic Modeling Symposium, our third symposium, will be held on April 3 and 4 2006, at the Fairmont Royal York Hotel in downtown Toronto. At the time of drafting this notice, the actuarial organizations agreeing to co-sponsor the symposium include the Actuarial Foundation of Canada (AFC), the Risk Management Section of the Society of Actuaries (SOA), the Investment Section of the SOA and the Financial Reporting Section of the SOA.

For more information about the call for papers and all other pertinent information on the symposium, please communicate with Gilbert Lacoste (Gilbert.Lacoste@sunlife.com) or visit www.actuaries.ca/meetings/stochastic_symposium_e.html. ♦

“

In the world of actuarial science, the use of stochastic models is evolving rapidly. The symposium’s goal is to identify and promote leading-edge practical applications for stochastic modeling.

”

Developing Effective Risk Management Strategies to Protect Your Organization

by Fay Booker

Introduction

Eron, WorldCom, and Barings Bank are household names and, unfortunately, examples of what can go wrong in big business. With these high-profile business failures, people have asked why the boards of these companies did not do a better job of managing the risks. But was the board even aware of the nature and extent of the risks? Had the board identified the risks requiring active management and oversight?

Let's state up front that every business has risk. It is unreasonable to expect a company to organize itself and enact all necessary activities to eliminate risk. This would be cost prohibitive. However, by identifying the risks of the business and assessing the likelihood and impact of the risk, the company can make cost-effective decisions as to the appropriate risk response.

Managing risk has become a critical element within most companies. How that risk is managed, though, can be structured differently within companies even for those within the same sector.

This paper will look at the following topics:

- Successfully identifying, assessing and managing risks for all stakeholders.
- Identifying the appropriate strategy for your particular needs.
- Ensuring the governance body understands risk.
- Developing a risk management framework.
- Incorporating risk management into your business planning.

Successfully Identifying, Assessing and Managing Risks for Stakeholders

So what is risk? In the business world, the word risk has come to mean *an impediment to the achievement of an organization's objectives*. Risk management has become the mechanism to manage risks so that the negative consequences are kept within acceptable tolerances.

Some executives state that their organization employs an enterprise risk management (ERM) framework. What is ERM?

ERM involves a strategic analysis of risk across an organization. The view is corporate rather than silos—it cuts across business units and departments and considers end-to-end processes. ERM enables an organization to identify and evaluate its risk profile. Thereafter, the organization can determine appropriate responses to the risk profile, given the business environment and the organization's objectives and priorities.

Developing Effective Risk Management Strategies to Protect Your Organization

There are unique risks for each organization, given the nature of operations, although generally organizations within the same sector will have common risk elements. The appropriate risk response will be different from organization to organization, depending on how management views the risk in terms of magnitude. Risks are represented in the external environment in which the organization chooses to operate, as well as those in the internal environment. Risk factors in the external environment and generally outside of the organization's direct control include politics, the economy, regulations, natural disasters and competition. Examples of those within an organization's control include reputation, safety of employees, safeguarding of assets, ethics and culture.

As Figure 1 on page 28 shows, a risk management framework involves a continuous cycle of identify, assess, measure, decide response, assign responsibility, monitor, report and inform.

Step 1: Identify

The first step to implementing ERM requires explicitly identifying the risks that are inherent to the business and operations of the organization. There are different techniques that can be utilized to identify the inherent risk and



Fay Booker, CA, CIA, is principal of Booker & Associates in Hamilton, Ontario. She can be reached at fbooker@bookerandassociates.com.

continued on page 28 ■

Developing Effective Risk Management Strategies to Protect Your Organization

▶ continued from page 27

therefore, the risk profile. Techniques such as self-assessment processes, completing surveys and facilitated risk workshops are generally used.

Facilitated risk workshops are a commonly used tool. The advantage of this mechanism is the ability to have workshops for different levels of responsibility, i.e., the governance level would have a different view of magnitude of risk than a front line staff member. Risk workshops also permit the inclusion of the greatest number of staff

from across the organization, thereby increasing their awareness of risk and their participation in finding solutions and identifying approaches to managing the risks. Decentralized risk ownership will require risk evaluation at individual activity levels, with roll up to line of business or business unit, and then an overall evaluation for the organization.

Consider the nature of objectives and risks that those at different levels and in different roles within a company would focus on. Table 1 provides examples of objectives and risks, by level, in a company that operates a national chain of retail stores:

Step 2: Assess

The next step is to assess the risk on two dimensions: the likelihood of occurrence and the impact of occurrence. Tools are available to assist participants at this stage to indicate their view of the risk. A common tool used is voting technology whereby each participant is allowed to “vote” his or her assessment on an anonymous basis. The technology then compiles the results of all participants’ votes on a defined scale and presents the results to the participating group. This allows the organization to identify if there is clear consensus on the assessment of risk or widespread views, thereby requiring further discussion and actions, possibly even training for the individuals.

The combination of the likelihood of the risk occurring, and the impact if it occurs, results in the degree of severity of the risk. Figure 2 on page 29 presents a graph demonstrating the collection of risks and the scale of risks with an organization.

Step 3: Measure

The organization needs to determine how the exposure will be measured. The measurement could be stated in different terms such as risk of financial loss through write-off of dollars or pay out of penalties or fines, risk of damage to business reputation or risk of loss due to inefficiency in processes.

At the end of step 3, risks will have been identified, measured and assessed as to the degree of severity. The resulting information from these steps is known as the risk profile.

A risk analysis process can capture information from the first three steps using a facilitated risk

Figure 1: ERM Circle

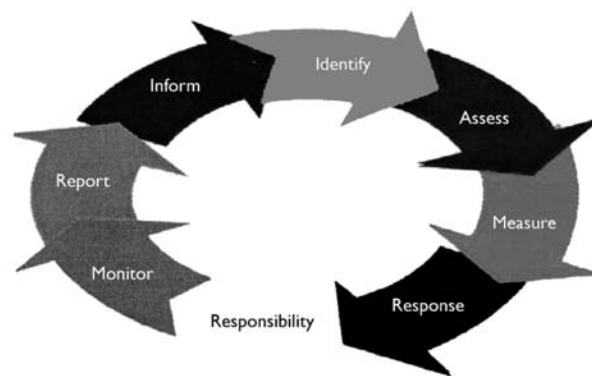


Table 1: Retail Company

Level/Role	Objective	Risks(s)
Board of Directors	Enhance shareholder value	Inappropriate strategy Excess infrastructure
CEO	Maximize net income	Underestimating competition Not attuned to consumer buying
Merchandising Manager	Maximize revenues	Goods don't arrive in time for season Goods don't reflect latest trend
Store Manager	Provide pleasant shopping experience for consumer	Insufficiently trained staff Store not appealing in appearance
Store Clerk	Minimize cash under	Illegal tender passed by consumer

workshop. Figure 3 below demonstrates the Risk Assessment Process.

Step 4: Decide Response

With the risk profile in hand, the next step is to determine what the appropriate response is to prudently manage the risk. The four risk responses include: avoid, accept, transfer, mitigate.

For each risk identified, the risk response can be articulated. It is expected that where the severity of the risk is high, there will be a strong risk response.

Every organization will have its own risk threshold. For example, where the risk response is to accept the risk, this becomes part of the organization's risk threshold.

Similarly if it is decided to accept risk to a certain dollar value, e.g., deductibility amount, this will be part of the risk threshold.

Step 5: Assign Responsibility

Each risk needs to be assigned to a position/person within the organization. The person responsible needs to ensure that the risk response is translated into actual day-to-day actions that will prevent and/or detect the risk. It will be this person's responsibility to manage the robustness of an insurance program, an outsourced arrangement, a policy statement, exception reporting, assignment of authorities, etc.

Step 6: Monitor

After implementation of the risk responses and management techniques, the managers need to monitor the actual activities to ensure that the identified risk stays within an acceptable threshold. Additionally, other units within an organization may take on a monitoring role. Some organizations have adopted centralized risk management groups, who have a responsibility to determine risk parameters and monitor actual results, to ensure that these parameters are honored. Internal audit also becomes part of the monitoring process, assuming the function is utilizing a risk-based internal audit approach.

Step 7: Report

The governance body and executive management will require information to be reported that allows them at their level of concern to be

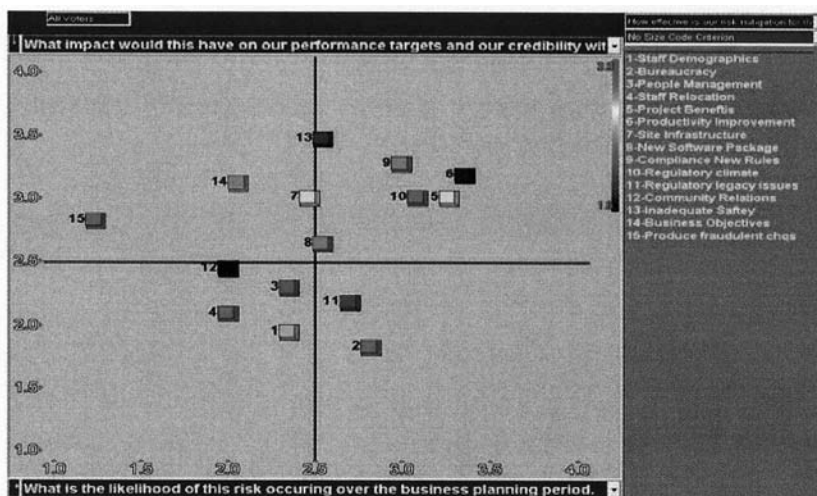
aware of the integrity of managing risks across the organization. Managers should determine the form of reporting necessary to best inform the oversight body.

Step 8: Inform

Information from the reports can be used to inform the annual update of the risk analysis

continued on page 30

Figure 2: Risk Graph¹



¹ The graph is produced using The Revolver*Ballot® Risk and Control Self Assessment Software. Information on this tool can be found at www.resolver.ca

Figure 3: Risk Assessment Process



Developing Effective Risk Management Strategies to Protect Your Organization

► continued from page 29

Table 2: Responses

Avoid	This response is to not accept the risk, e.g. exit the business.
Accept	This response is to accept the level of risk and take no action to minimize it further.
Transfer	This response is to transfer the risk to someone else, e.g. purchase insurance.
Mitigate	This response is to take action to manage the risk generally through a system of internal controls.

process, as well as the updating of risk responses and policies. Risk management is a continuous process and also a continuous improvement process.

Identifying the Appropriate Strategy for Your Particular Needs

Some companies have adopted a centralized model for risk management, while others are using a decentralized model. The approach depends on an organization's particular operations, the significant risks, the culture of the organization, the management style and the control environment, i.e. the degree of centralization or the delegation of authority and the infrastructure of the business.

In a centralized model it is the risk management department that develops policies for the board to consider. Included in the policies will be decisions on the amount of risk to be taken. Thereafter, the authority for making the risk decisions is with the risk management department as is monitoring and reporting on the risk. The line staff provide the source information to the risk management decision makers.

Other organizations have decentralized operations requiring the involvement of front line staff in managing the inherent risks of the company, of the business unit or of the process. This model

requires staff education, clear understanding of the need to adhere to control practices, accountability in job descriptions and mechanisms for senior management to identify and aggregate the risk exposure.

Ensuring the Governance Body Understands Risk

Risk management is one element of robust corporate governance but, like anything else, in order to be effective, there must be a solid understanding by those with the oversight responsibility.

Following is the standard that the Canada Deposit Insurance Corporation, the regulator of the financial institutions, has set for the governance level.

It is a sound business and financial practice for the board of directors to:

- 1) Understand the significant risks to which the institution is exposed.
- 2) Establish appropriate and prudent risk management policies for those risks.
- 3) Review those policies at least once a year to ensure that they remain appropriate and prudent.
- 4) Obtain, on a regular basis, reasonable assurance that the institution has an ongoing, appropriate and effective risk management process and that the institution's risk management policies for significant risks are adhered to.

The Canadian securities administrators have identified similar responsibilities for boards of directors.

The first element, which requires understanding of the significant risks, can be accomplished through presentations from executive management on the analysis of the risk profile of the company. Additionally, the governance level can participate, with executive management, in a facilitated risk workshop to articulate and discuss the risks which are inherent to the business, products and services.

Once informed on the significant risks, the board can then direct management to develop policies for the board's consideration. Being informed will enable the board members to sufficiently consider and conduct due diligence on

draft policies. The annual review process should consider changes in the external business market, changes within the company and changes to the company's strategic objectives.

The most significant element of the standard is to "obtain reasonable assurance that the institution has an ongoing appropriate and effective risk management process and that the institutions' risk management policies for significant risks are being adhered to." This is a significant obligation indeed. So how do boards gain reasonable assurance?

Different tools should be made available to the governance level. The CEO can be requested to provide information that demonstrates the ongoing active management of the risks. Increasingly, audit committees are being delegated responsibility for overseeing risk management practices of the organization. This responsibility requires support from within the organization, and the vehicle that is commonly selected is the internal audit function. Given the independence of the internal audit function, it is seen as a means to provide the governing level with an independent assessment of the appropriateness and effectiveness of the risk management practices.

Following is an extract from the terms of reference of an audit committee outlining their responsibilities for risk management.

Risk Framework

The audit committee will ensure that there is proper understanding by the board of the risks of the company and the specific risks of products and processes. The audit committee will:

- Understand the risks associated with the business that the company provides and ensure that appropriate means are in place to manage these risks.
- Review and recommend prudent risk management policies to the board.
- Receive from management ongoing reports on operation of risk management practices and risk thresholds.
- Receive from the internal audit function periodic reports on the effectiveness of risk management practices.

As a key supporting resource to the governance level, and in particular the audit committee, internal audit functions are being asked to take on greater responsibility in the area of risk assessment and risk management activities. However, this responsibility cannot be imposed on the internal audit function unless it has the competency and capability to undertake this significant assignment. It is a simple task to update the internal audit function's mandate to include responsibility for assessing risk management, but it is a more considered task to ensure that the function is capable of undertaking the responsibility.

Developing a Risk Management Framework

So how does a company develop a risk management framework appropriate to its business and nature of operations? Before establishing a framework and undertaking process, the following elements must be in place to permit effective risk management:

- 1) *Support at senior levels:* The need for risk management must start and be supported at the highest level within the company. This includes the governance level and the CEO. The support must be genuine.
- 2) *Proactive not static:* Risk management efforts must be proactive. This involves the active identification, measurement and management of the risks, scanning of changes in the risk profile and reports on managing the risk profile.
- 3) *Clarity of understanding:* There needs to be a clear definition of the risks, and these must be understood across the organization.
- 4) *Accountability:* Responsibility for responding to and managing the risks must be clearly understood and individuals held accountable for fulfilling the roles. Managing risk must be seen as part of every process and position.
- 5) *Resources:* Appropriate resources including people and tools need to be deployed and available to help managers, executive and the governance level conduct their obligations within the risk management framework.
- 6) *Culture:* The organization's culture must provide for the active management of risk.

continued on page 32 ■

Developing Effective Risk Management Strategies to Protect Your Organization

► continued from page 31

Once a company has decided that it will support each of these elements, a champion within the organization can be selected to start the process to identify, measure, assess, etc., and thereafter ensure the continuance of the process.

Incorporating Risk Management into Your Business Planning

Risk identification should be an explicit step in a company's strategic planning cycle. This would require consideration of those risks that might arise in the longer-term planning horizon. Identification of the emerging risks during strategic planning will be more important than acknowledging the current risks inherent to the business. The anticipated impact of emerging risks may render the business or products obsolete and, therefore, signal very aggressive responses such as innovation or divestment.

Consider the following²:

A DIRECTOR'S STORY: As I head into retirement and look back on my career as an independent director, I realize that my efforts were mostly futile. I think especially of my time as a director of a financial institution that failed. Management gave us reams of information about past performance and we dutifully discussed it. We were looking at the wrong information and asking the wrong questions. We should have focused on the future and questioned the strategy and the competence of management to execute it. That's what caused the institution to fail and the board didn't wake up until it was too late.

At each level of planning in a company's annual business planning process, there should also be an examination and analysis of risks, current and emerging. This consideration for risk should be conducted at unit level and department level, as well as enterprise level. The risks should be examined and the responses determined. The response may translate into specific marketing or selling actions, or even financing decisions. The business plan can capture these considerations and provide for an informed company, governance and management level to proceed in an organized prudent manner.

Summary

Risk management is a discipline that can assist in the success of an organization. Like anything that pays dividends, it takes knowledge, commitment and support to provide the greatest benefits to an organization.

The greatest reward should be a shift from reacting to crisis to being aware of and managing risk. Being in control, having structure and being organized allows for a business environment that is empowering and permits taking advantage of opportunities. It also allows for a knowledgeable and learned employee group and governance body.

Hopefully risk management is a factor in ensuring that your organization is well known for its success. ♦

² CICA, Guidance for Directors – Dealing with Risk in the Boardroom, April 2000.

ERMII: An International Initiative Involving Leading Universities and Professional Organizations

by Shaun Wang

In the current, all-out race for “ERM leadership,” a consortium of leading universities and professional organizations worldwide has taken action to jointly sponsor the ERM Institute International, Ltd. (ERMII)—a nonprofit educational and research organization with a focus on education, research and training in the ERM conceptual framework, quantitative methods and tools, and best practices. Established to meet the needs and challenges of the future risk professionals and enterprise risk managers, ERMII has set the following objectives and action plans.

Objective 1: To develop and promulgate international standards for quantitative risk education intended to be the core foundation for risk managers in all major economic sectors including banking, insurance, investment, energy and other utilities, and nonfinancial industries (manufacturing, retail, transportation, health services, government, etc.).

Sound risk analysis and valuation in today's complex financial, accounting and regulatory environment will require that the next generation of risk managers better understand the intricate interplay of all risk exposures and their management in an integrated framework. Graduates entering a risk management career require sound training in not only quantitative risk modeling for financial risks, but also risk measurement that reflects the organizational and operational aspects of risk, and more importantly, how to integrate them within a holistic ERM framework by encompassing differing perspectives of various stakeholders. Leading universities and professional organizations worldwide have recognized the need for a broad-based risk education that integrates all risk management-related fields, many of which are currently narrowly defined: for example, equity risk, credit risk, or actuarial risk modeling and management. To achieve this goal, ERMII will:

- Develop and publicize standards for excellence in broad-based quantitative risk education by the universities and colleges.
- Accredite educational institutions that satisfy the curriculum, research and teaching standards.
- Provide students graduating from an ERMII accredited university program the opportunity to complete a capstone risk management course where, upon successful completion, they will satisfy the requirements for the certificate *Chartered Risk Analyst*.

Objective 2: To promote multidisciplinary, international research in the emerging discipline of enterprise-wide risk management by developing innovative concepts, effective quantitative tools and strategies.

The growing practice of enterprise risk management has generated a large variety of issues that can only be addressed through conceptual and theoretical innovations via multidisciplinary fundamental research. ERMII aspires not only to expand the types of risk that can be quantified or the precision with which they are managed, but also to encourage research that explores the concept of risk in relation to valuation dynamics, information, management, behavioral, incentive and strategic issues. The ERMII, through its international consortium of universities and professional organizations, will encourage and advance integrated risk management knowledge for the benefit of individuals, business and societies. To achieve this goal ERMII will:

- Initiate and sponsor research projects to be conducted by member universities in close collaboration with industry professionals and government officials.
- Sponsor and organize workshops, conferences and symposia that will highlight important innovations in enterprise-wide risk management and increase dialogue between academics and professionals.

continued on page 34 ■



Shaun Wang, ASA, MAAA, FCAS, Ph.D., is a leading scholar and passionate advocate of ERM. He serves as the interim chairperson of the ERM Institute International, Ltd. He can be reached at SWang@ermii.org.

An International Initiative Involving Leading Universities...

► continued from page 33

- Building on the latest regulatory and professional accomplishments, conduct research to develop expert guidance on risk measurement methods and tools for specific industry sectors.

Objective 3: To help existing and future institutions and organizations to improve professional standards of education, professional conduct and competence in the modeling and management of risk on an enterprise-wide basis.

There currently exists a number of organizations that represent various specialties within the risk management profession. The risk education covered by the educational standards of these profes-

sional bodies is, due to historical silo approaches, narrowly focused. They also do not yet cover the quantification, modeling and management of a broad set of risks in an integrated way. Further, the degree of technical sophistication required for certification differs greatly across many of these organizations. ERMII, through its Chartered Risk Analyst certification, seeks to ensure a consistently high level of professional competence in the quantification and modeling of a broad set of risks for *all risk professionals*. To achieve this goal ERMII will :

- Work jointly with sponsoring organizations to establish mutual recognition and complementary training.
- Work with the specialized-risk professional organizations to ensure university-based CRA certification will satisfy the foundational components of their professional requirements .
- Review the current and previous certification requirements of the specialized-risk professional organizations to determine

Table 1: ERMII Charter Member Universities and Professional Organizations

Institution	Department	Country	Contact Person
Carnegie-Mellon University	Quantitative Finance	United States	Steven E. Shreve
Casualty Actuarial Society	Professional Organization	United States	John Kollar
Centre d'Etudes Actuarielles (via the University Paris Dauphine)	Actuarial/Finance/Statistics	France	Jean Berthon
Georgia State University	Risk Management and Insurance	United States	Richard Phillips
Heriot-Watt University	Actuarial & Statistics	United Kingdom	Andrew Cairns
Institute of Actuaries of Australia	Professional Organization	Australia	Tony Coleman
University of Illinois at Urbana-Champaign	Finance	United States	Steve D'Arcy
University of New South Wales	Actuarial & Mathematical Finance	Australia	Mike Sherris
University of Waterloo	Actuarial & Quantitative Finance	Canada	Ken Seng Tan
Wuhan University	Finance	China	Yong-Gang Ye

the extent to which the professional designations meet the educational requirements of CRA certification to achieve maximum educational leverage .

The initial Charter Member Universities and professional organizations of ERMII (with the representative persons) are shown in Table 1 on page 34.

ERMII is continuing to discuss founding memberships with several other interested universities and professional associations worldwide.

By its defining nature, ERM needs to encompass multiple disciplines and perspectives and requires collaboration and coordination at the international level. ERMII already has this essential element for success. ERMII has assembled an impressive list of founding member universities and professional organizations, and is in the process of growing into a larger international network of high-quality universities and professional organizations. The core educational and research activities set out by ERMII are aligned with the top priorities of these member universities and professional organizations. For them, ERMII is not an extra outside initiative, but an essential element that helps them achieve their own organizational missions through international and academic-industry collaboration.

In a previous Risk Management Section Newsletter article, our highly respected leader, Jim MacGinnitie (past president of SOA, CAS and IAA), has already described the landscape of the risk management field and the rationale for supporting ERMII. In addition to Jim MacGinnitie, there are over 20 industry and academic leaders who, convinced of the value of ERMII, dedicated their time and efforts in its formation. As of today, ERMII has received widespread support by many business leaders and employers. There is tremendous momentum for ERMII at the international level.

Many of us are aware of the challenges and opportunities faced by the actuarial profession, especially in light of the rapid changes in the broader risk management field. The actuarial profession has yet to respond to the Morris Review: “The first concern is that the profession has been too insular, with insufficient contact with other professions and too narrow a professional training, and has been slow to adopt new

approaches and techniques. This has resulted in useful inputs from the disciplines of economics, statistics and demography, to name a few, having less impact than they should.”

I believe that ERMII presents the actuarial profession a unique opportunity to join forces with a broader international academic community that by its nature is broad-based and dedicated to innovations in education and research. Some leading actuarial organizations have taken actions to join ERMII, while others are still in the process of evaluating .

In today’s changing landscape of risk management, a group of leaders have decided to focus all their energy to develop the emerging discipline of ERM. ERMII currently has many important activities underway, including a working group in charge of syllabus development, and a working group in charge of research. You are cordially invited to join us and help continue the excellent progress. ♦

COTOR: Adventures With Risk Theory

by Louise A. Francis

The Committee on the Theory of Risk (COTOR) is one of the Casualty Actuarial Society's (CAS) research committees. As such, the committee sponsors research related to risk theory, promotes continuing education on the topic and in general tries to engage in thought-provoking activities that will expand the leading edge in actuarial science. Our projects have included:

- Awarding a grant to conduct research on methods for computing risk loads for discounted liabilities.
- Sponsoring a statistical estimation challenge. The objective was to estimate excess loss costs of a sample of claims from a heavy-tailed distribution.
- Initiating a training project to train actuaries in modeling methods that could be very useful to actuaries in the practice of some of their core functions, such as reserving and ratemaking.
- Awarding a prize to the best paper in an American Risk and Insurance Association (ARIA) publication.

In keeping with the committee's goal to promote continuing education on risk theory, we have sponsored sessions at the CAS's Spring and/or Fall meetings for several years. One of the most successful of these presentations was the "COTOR Challenge." The challenge addressed a problem in extreme value theory. It originated when a COTOR member challenged his colleagues to estimate the pure premium in the layer 500K xs 500K based on a listing of 250 claims. The challenge was later refined and distributed to the membership of the CAS. Stuart Klugman, our resident loss-distribution expert, picked the sample of 250 claims generated randomly from an inverse transformed gamma distribution. The challenge was to estimate the average severity and 95 percent confidence intervals for the \$5 million xs \$5 million layer. In total, eight different people responded to the challenge, submitting a total of 10 different responses. The results of this challenge were presented at the November 2004 CAS Annual Meeting in Montreal. Five of the eight responders and Phil Heckman (applying

his round 1 technique to the round 2 data) presented their results and techniques to a standing-room-only crowd. The committee chairman, Louise Francis, presented an award to three challenge participants—Dave Clark, Glenn Meyers and Jonathan Evans—based on a number of factors considered together, including the accuracy and the clarity of the solutions, as well as the creativity used and ability of the method to lend itself to practical application.

When analyzing the submitted results for the challenge, there was a nearly 13 to 1 spread between the lowest to highest mean. All responders recognized there was tremendous uncertainty in the results (the range from upper to lower confidence level went from a low of eight to a high of infinity). All but two of the responders relied on approaches commonly found in the literature on fitting distributions or modeling extreme values. Only one of the results came within 10 percent of the true mean. Interestingly enough, half the responses were below the true mean and half were above. When an obvious outlier response was eliminated, and the remaining responses were averaged, the resultant average was within 2 percent of the true mean. The panel discussed that potential implications were for an insurance company and should not rely on the results of only one model when making important decisions.

A few general summary comments about the solutions submitted are in order. First, a number of participants used some form of the Pareto distribution. This is not surprising, as the Pareto distribution is prominently represented in the extreme value literature. Both the single parameter Pareto, popularized by Stephen Philbrick (1985), and a version dubbed "the Generalized Pareto" in some of the extreme value literature (there is actually more than one Generalized Pareto in the statistical literature) were used by various responders. Many of the formulas used in the fitting of a Pareto are relatively simple to implement, and the Pareto has a much heavier tail than some more conventional distributions such as the lognormal. However, since the Pareto is a truncated distribution, i.e., it is fit

Louise A. Francis, FCAS, MAAA, is consulting principal of Francis Analytic & Actuarial Data Mining, Inc. in Philadelphia, Penn. She can be reached at Louise_francis@msn.com.

only to data that exceed a selected threshold, there are significant issues with how to select the threshold. Different choices typically result in different parameter estimates and the different parameter estimates can result in very different estimates for excess layers of insurance.

A number of authors fit a “ground-up” distribution to the data, rather than fitting a distribution just to tail claims. In this category was the mixture approach. Mixtures of distributions are known to have heavier tails than the individual distributions have. Another approach used transformed the data (e.g., applied a functional transform such as the log of the claims) until a distribution near to one of the more conventional densities, such as the Lognormal or Gamma, is obtained. Certain transforms, such as the inverse, log and multiple log transforms, often result in distributions with heavy tails. A third approach involved the use of kernels to approximate the distribution. The kernel approach has appeared in the statistical literature recently as a non-parametric technique for approximating densities.

More details of the challenge, including write-ups of the responses submitted, can be found on the CAS Web site at www.casact.org/cotor/. There will be another round to the challenge in 2005. We intend to make it more challenging by adding an additional random factor commonly encountered in reinsurance estimating applications.

One of COTOR’s sponsored research projects was dubbed “The Risk Premium Project.” It addressed an aspect of the estimation of risk load for liabilities: the estimation of rates of return using Capital Asset Pricing Model (CAPM).

Eugene Fama and Kenneth French (1992) sent shockwaves through the finance community when they published a paper suggesting that Beta (the covariance of the company’s stock return with that of the market) was not the only relevant factor for predicting a company’s stock return. The author’s research questioned one of the cornerstones of financial theory, CAPM, which has often been used to compute rates of return on equity, particularly in a regulatory environment.

CAPM states that

$$r_c = r_M + \beta_c (r_m - r_f)$$

where

r_c is the company’s return

r_M is the return on the entire market of all investments

β_c is the company Beta

$(r_m - r_f)$ is the market risk premium.

CAPM may be familiar to those involved in rate filings, as it is often one of the key financial theories used in the regulation of insurance companies to determine a “fair rate of return.” The use of CAPM is controversial among actuaries, as it has sometimes been used to “prove” that insurance companies are exposed to very low risk and, therefore, merit little or no return above that supplied by the risk-free rate of return. Usually the “proof” involves demonstrating that insurance industry Betas are low or, in some cases, negative.

The CAS funded a team of researchers to advance the state of the art in the insurance industry, with respect to the use of CAPM based approaches, to derive rates of return. The research team incorporated a number of the most recent findings into a model for CAPM and rates of return, which is much richer than the conventional approach, as it incorporates a number of factors into the estimates that have been demonstrated to impact rates of return. A summary of the research can be found at the COTOR Web site www.casact.org/cotor/. A paper based on the research is forthcoming in the *Journal of Risk and Insurance*. ♦

References

- Fama, Eugene F., and Kenneth R. French. 1992. The Cross-Section of Expected Stock Returns. *Journal of Finance*. 47:427-66.
- Philbrick, Stephen. 1985. “A Practical Guide to the Single Parameter Pareto Distribution.” Proceedings at the Casualty Actuarial Society. Online at www.casact.org/pub/proceed/proceed85/85044.pdf.

“

Clearly, the decisions made by management can only be as good as the information they are fed by the myriad of upstream financial, legal, actuarial and information analysts.

”

Operational Risk Assessment in IT Projects

by Michel Rochette

Operational risk can sometimes be a broad and elusive concept. A definition is thus necessary. The accepted definition within the financial community is to define operational risk as the risk of direct and indirect losses resulting from inadequate or failed internal processes, systems, people or external events. This is also the definition that is used by the majority of financial institutions that estimate the amount of economic capital required to cover this unexpected consequence of this risk, as mandated by some new regulatory standards.

However, for internal purposes, institutions may want to add other risks to the definition of operational risk in order to satisfy additional business goals. For example, some institutions want to assess the qualitative or quantitative impacts resulting from events affecting their repu-

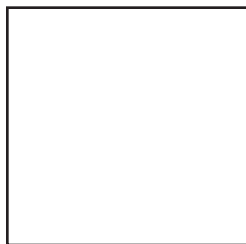
tion. Others are measuring strategic impacts as well. Others are becoming interested in assessing risks that pertain to projects.

These projects can be new products, new geographic locations, new ventures, overhaul of existing operations, new IT software development, etc. They involve many people, many steps, many processes, many systems and are affected by external events. Thus, assessing and managing the many risks faced by any project will help an organization reduce the likelihood of its failure and contribute to a better use of its limited human and monetary resources to the management of the most risky ones.

A possible approach to assess the riskiness of a project is the scorecard approach in risk management. It has a lot of similarities to traditional actuarial and underwriting of risk. The first

Table I

Operational Risk Category	Risk Drivers
IT Systems	<ul style="list-style-type: none"> • Number of providers • Level of technological reliability • Technical complexity • Number of links to existing and future systems
Process and Human (Direct Implementation)	<ul style="list-style-type: none"> • Number of providers • Relative size of the project • Team diversity • Length of project • Definition of roles • Number of steps in the project • Team expertise
Process and Human (Indirect use)	<ul style="list-style-type: none"> • Number of changes to the processes • Expertise of the uses of the IT systems • Number of internal and external users
Credit	<ul style="list-style-type: none"> • Financial capacity of the IT providers
Legal	<ul style="list-style-type: none"> • Number of legal contracts to negotiate
External	<ul style="list-style-type: none"> • External events outside the organization



Michel Rochette, FSA, MAAA, MBA, is an actuary specializing in risk management for CDP Capital in Montreal, Quebec. He can be reached at mrochette@lacaisses.com.

component is the identification of operational risk drivers or risk factors that might cause a project to fail (see Table 1 on page 38). In other words, the determination of the factors that explain the frequency of failure of the project. These risk drivers are then rated. A similar approach is done for the likely impacts following failure—monetary or non-monetary—taking into account the effectiveness of controls that are put in place to mitigate its failure. Then, the riskiness of the project—the project risk score—is measured as the rated frequency times the rated impacts net of controls. Then, depending on the risk tolerance of the organization, a decision is made to go ahead or not with the project and necessary resources are allocated to manage its resulting risks.

The rest of this article briefly explains such an approach. It was developed for the assessment of operational risk for IT projects. It has now become an integral part of the process to make decisions about IT projects in my company. In fact, standards like COBIT in IT software development usually mandate this analysis.

The first component of the project risk score is the calculation of the score for the frequency. It is obtained by scoring the risk drivers that explain incidents from the IT systems themselves—from direct processes related to the implementation of the IT systems, indirect processes related to the use of the new IT systems, human fraud, legal incidents resulting from negotiating IT contracts, the credit failure of the companies providing the IT systems and other external events affecting the project overall.

Table 1 on page 38 lists the main risk drivers for each category of operational risk for the IT project. They were chosen because of the fact that they can be measured easily from the information that is usually part of an IT project like the forecasted budget, the time associated with it, the number of people involved, etc. Also, they were cross referenced to the many published articles on the subject over the years.

Each risk driver was scored as a null, weak, moderate or high risk (see Table 2). Then, a number was assigned for calculation purposes. The risk scoring reflects knowledge of the IT experts and the risk tolerance of the organization, as well as taking into account the size and scale of the organization. Over time, these scores will

be translated in probabilities as experience is accumulated.

For example, the score associated with the number of providers was determined based on the following scale.

Table 2: Example of the Risk Scale of a Risk Driver Number of Providers

Risk Driver	Score
No provider	Null (0)
1 provider	Weak (1)
2 to 3 providers	Moderate (2)
More than 3 providers	High (3)

Once all risk drivers were scored, the overall riskiness for the frequency was calculated simply by averaging all risk scores. It would also be possible to weigh more some risk drivers, and the average score could be further analyzed separately for each risk category.

The second component of the project risk score is the calculation of the score for the monetary impacts from potential incidents in each risk category (see Table 3 on page 40).

Again, a similar approach to the frequency component was followed. The impact for each component of risk was estimated as a percentage of the relevant IT budgets.

To determine the overall riskiness related to the impacts of the project and to add some conservatism, all monetary impacts were simply summed. We didn't take into account non-monetary impact for the time being. Then, reflecting past expert knowledge and the risk tolerance of the organization, the overall impact of the IT project was scored on a scale of null, weak, moderate and high risk (see Table 4 on page 40).

Risk Management Issue Number 5 • July 2005

Published by the Society of Actuaries
475 N. Martingale Road, Suite 600
Schaumburg, IL 60173-2226
phone: (847) 706-3500
fax: (847) 706-3599
www.soa.org

This newsletter is free to section members. A subscription is \$15.00 for nonmembers. Current-year issues are available from the Communications Department. Back issues of section newsletters have been placed in the SOA library and on the SOA Web site: (www.soa.org). Photocopies of back issues may be requested for a nominal fee.

2004-2005 SECTION LEADERSHIP

Editor

Ken Seng Tan, ASA
University of Waterloo
Waterloo, Ontario
Canada N2L3G1
phone: (519) 888-4567 xt. 6688
fax: (519) 746-1875
e-mail: kstan@uwaterloo.ca

Council Members

Douglas W. Brooks, FSA
Charles L. Gilbert, FSA
John J. Kollar, FCAS
David Ingram, FSA
Beverly Margolian, FSA
Hubert B. Mueller, FSA
Frank P. Sabatini, FSA
Ken Seng Tan, ASA
Fred Tavan, FSA
Shaun Wang, ASA

Society Staff Contacts

Clay Baznik, Publications Director
cbaznik@soa.org

Newsletter Design

Joe Adduci, DTP Coordinator

Facts and opinions contained herein are the sole responsibility of the persons expressing them and should not be attributed to the Society of Actuaries, its committees, the Risk Management Section or the employers of the authors. We will promptly correct errors brought to our attention.

♻️ This newsletter was printed on recycled paper.

Copyright © 2005 Society of Actuaries.



SOCIETY OF ACTUARIES

All rights reserved.
Printed in the United States of America.

continued on page 40 ►

Operational Risk Assessment in IT Project

▶ continued from page 39

Table 3

Operational Risk Category	Monetary Impacts
IT systems	Budget for the IT equipment and software
Process and Human (Direct implementation)	Budget for the internal and external human employees and consultants
Process and Human (Indirect use)	50% of the total IT budget
Credit	50% of the the budget of the IT providers
Legal	1% of the total IT budget
External	1% of the total IT budget

Table 4: Risk Scale for the Monetary Impact

Total Monetary Impacts (Exposure)	Score
Less than \$50,000	Null (0)
Between \$50,000 and \$100,000	Weak (1)
Between \$100,000 and \$250,000	Moderate (2)
More than \$250,000	High (3)

Table 5: Risk Scale for the IT Project Risk Score

IT Project Risk Score	Score
0	Null
Between 1 and 3	Weak
Between 4 and 7	Moderate
More than 7	High

And as actuaries are familiar, an overall risk score is calculated as the product of the frequency and impact score. Then, for internal communication purposes, instead of talking in terms of expected averages, the IT project risk score has been communicated as words using the following scale (see Table 5).

So far, 14 IT projects in 2005 have been analyzed using this new approach. More than one third of the IT projects had a risk score that ranked above moderate. Given these risk scores, more resources in project management were allocated to these respective projects, resulting in a better allocation of the firm's resources and, indirectly, economic capital.

Some refinements are under way, like integrating the effectiveness of controls—control score—in this process. This is particularly relevant given the interest firms have in certifying their financial statements under the new SOX regulatory standard. Also, it is envisioned that a more refined risk assessment will be developed as loss data is accumulated, which will allow us to be able to statistically measure some of these components.

Finally, this has been an interesting project to demonstrate to different groups in my company how my actuarial background, along with the knowledge developed over the years in the field of risk management, could help it better assess and manage the operational risk resulting from IT projects. ♦