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Toward Leadership in Risk Management

by David Ingram

"The vision of the Society of Actuaries is for actuaries to be recognized as the leading professionals in the modeling and management of financial risk and contingent events."

—SOA Mission Statement



Chairperson
David Ingram, FSA,
MAAA, is a consulting
actuary at Milliman USA
in New York. He can
be reached at
david.ingram@
milliman.com

The SOA adopted the above as part of the mission statement in 2001. For many years actuaries were the only professionals who were trying to model and manage risk. Throughout the 20th century, the application of statistical techniques to business and investment problems became more and more widespread. In the 1970s, the revolution in financial economics started and very sophisticated modeling became the backbone of financial analysts. Futures contracts came into being in the 1970s, options in the 1980s and by the early 1990s there were several incidents of massive company (and government entity) losses from derivatives portfolios. The discipline that is now widely called risk management came out of the impact of those problems in the banking industry.

During the past 30 years, actuaries have significantly added to the sophistication and complexity of our risk-management techniques. Actuarial and insurance company risk management practices had taken a different track than those of banks. During the 1980s when billions of dollars were being lost due to interest rate mismatch in savings and loans, actuaries were working on developing ALM systems for insurance companies. Insurance companies were largely kept out of significant derivative exposures by regulatory restrictions and inherent conservatism of management. In addition, the book value accounting system used by insurance companies shielded them from some of the volatility that was plaguing banks where "mark-to-market" was implemented as the solution to slow recognition of problem situations. During the 1980s, actuaries developed rudimentary economic capital calculations and used them to develop what are now called RAROC internal financial reporting systems when banks use them. In addition,

many actuaries led their companies to develop profit analysis (pricing) systems that reflect the impact of risk capital allocation as a cost or deferral of profits.

By the 1990s, banking regulators had started to insist that banks adopt the new risk management techniques of identifying risks, measuring risks, controlling risks and managing risks. Some large banks are now reported to have risk management departments of over 100 people.

In the late 1990s, a task force of the Finance Practice Area under Jack Gibson was formed to study what banks were doing. In 2000, Sue Collins, the SOA vice president for the Finance Practice Area, asked me to form a risk management task force (RMTF) with the charge to (a) hold a seminar to introduce actuaries to these new risk management ideas and (b) to explore areas where the SOA could expand the available resources for actuaries to learn about risk management. That original group, Todd Henderson, Steve Marco, Josephine Marks, Hubert Mueller, Jim Reiskytl, Max Rudolph, Ruth Sayasith, Bill Schnaer and Vinaya Sharma met via teleconference for about six months discussing the definition of risk management and trying to develop a priority project that we could undertake. We never reached consensus. We agreed to disagree. But rather than give up at that point, the group agreed to take our wide range of interests public and find out how many people were like-minded. We started with a list of over 30 possible projects and eventually got down to 10 that two or more of us agreed were of high priority to the profession and of high personal interest. At the end of February 2001, the new Finance Practice Area staff actuary, Valentina Isakina, organized a blast e-mail to the SOA membership soliciting volunteers for the 10 new risk management projects.

What happened next was unexpected and probably totally unprecedented. In the next month, Valentina and I received over 150 e-mails from interested volunteers!!! The 10 groups scrambled to get started to make sure that we put that



volunteer interest to work. The groups all developed as very member-directed and high-energy project teams. Some groups held monthly calls and for others that wasn't enough; they did their calls twice a month. Group members scoured Web sites and libraries and developed reading lists for several subjects. One group hosted several telephone mini-seminars, the most popular of which brought the SOA phone system to its knees with over 50 participants, while dozens complained of being unable to connect. One group has produced a practice guide and another secured funding for a research project. Several groups did surveys of current risk management practices. The groups were very electronically oriented from the start and, as work product was developed, Rick Pitts stepped forward to coordinate the development of the RMTF Web site.

At the 2002 Annual Meeting, Harry Panjer took the gavel as the 54th president of the SOA. Dr. Panjer, who has published papers on risk-management topics in actuarial and non-actuarial publications, included risk management as one of his key areas for development during his term. The SOA strategic planning committee, led by Norm Crowder, worked to complete their investigation into member and market needs and perceptions. Much of the research and committee discussion focused on possible roles for actuaries in risk management. In the spring of 2003, an SOA board member, Mike McLaughlin, volunteered to take up the charge from the board to help to develop a new Risk Management Section. Members and leaders from the RMTF and several other key people were recruited to develop bylaws, a petition to the board and a call for initial members. Those steps were completed in about one month and at the June board meeting, the board approved the petition allowing the organizing committee to go ahead with recruiting members for the section. By August, the required minimum of 200 members had sent their \$20 to Lois Chinnock, who is the tireless

back-office manager for all of the sections, and we were live. As of January 2004, Lois told me that there were almost 700 members in the Risk Management Section and more are to come as the 2004 dues are paid.

In September, the Risk Management Section held our first election and elected nine council members. At the annual meeting in October, we held our first section council meeting and elected officers. So here we are. What are we going to do?

“ During the past 30 years, actuaries have significantly added to the sophistication and complexity of our risk management techniques. ”

All nine council members were able to attend an all-day planning meeting in December to address that question. I have to say that you, as members, have elected an amazing group. The discussion lasted over five hours with all council members being active participants in almost every part of the agenda. The middle of the day was reserved for the strategic discussion. What emerged in that

discussion was a remarkable clarity and unanimity of vision for what the section should be about. Here is a brief summary of that vision:

1. The Risk Management Section will work to further risk management education and research in a manner that will serve section members across all industries, focusing on insurance and broader financial services industries.
2. The Risk Management Section will work to establish leading, practical risk-management techniques and practices.
3. The Risk Management Section will perform, sponsor, and encourage risk management research, working with the Casualty Actuarial Society to the greatest extent practical.
 - Sponsor risk-management education material, seminars and symposiums
 - Develop communication skills for complex risk-management ideas
 - Advance the risk-management skills of actuaries



Taking a break from the inaugural meeting of the Risk Management Section Council in Orlando are:

(Back row, left to right): Charles Gilbert (section treasurer), Hubert Mueller (Spring Meetings Program Committee representative), Frank Sabatini (vice-chairperson and Annual Meeting Program Committee representative and David Ingram (section chairperson).

(Front row, left to right): Mike McLaughlin (section organizing committee chairperson), Lois Chinnock (SOA staff) and Michael Kaster (former SOA staff).

Other Council Members: Beverly Margolian, Henry McMillan, Ruth Sayasith, Ken Seng Tan and Shaun Wang.

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Where is ERM Heading?

by Shaun Wang



Dr. Shaun Wang,
FCAS, ASA, Research
Director of SCOR
Group in Itasca, Ill.
He can be reached at
swang@scor.com.

For actuaries in various areas of practice (whether it is product design, pricing, reserve setting or others), risk management already exists in our day-to-day job functions. Lately enterprise risk management (ERM) has become a new buzzword, and in part prompted the SOA to create this new Risk Management Section. So what is exactly in store for us in the ERM movement and where are we going with it?

What is ERM?

According to the CAS Committee on Enterprise Risk Management (May 2003 Report):

"ERM is the discipline by which an organization in any industry assesses, controls, exploits, finances and monitors risks from all sources for the purpose of increasing the organization's short- and long-term value to its stakeholders."

As stated in the recently published SOA ALM Specialty Guide, ERM considers the broad range of risks associated with operating a business, including financial, strategic, operational and hazard risks from a company (or "holistic")

perspective rather than a product (or "silo") level. The goal of ERM is to minimize the effects of risk on an organization's capital and earnings to better allocate its risk capital and to enhance shareholder value through established risk limits, lower capital costs and improved resource allocation.

Part 1. What's Behind the ERM Movement?

A good explanation for increased emphasis on ERM can be found in the ALM Specialty Guide: "Recent high-profile bankruptcies and shareholder lawsuits due to rogue traders, liquidity mismanagement, inappropriate accounting practices and corporate statements, has led to an increased emphasis on ERM from investors, regulators and senior management."

The emergence of ERM and its growing popularity is coinciding with many changes that have taken place in the insurance/financial industry:

1. Convergence: The insurance industry has witnessed rapid convergence with the banking and broader financial services industries. Life insurers, banks and mutual funds have crossed over each other's boundaries and are offering integrated investment vehicles to compete for the "savings dollars" of customers. As a result, life insurance and annuity products are getting more and more complex with many explicit or implicit options that are linked to broader market indicators (such as interest rates or stock indices). Willingly or not, life companies are under growing pressure to interact more with the capital markets for price setting and hedging. In 2000, the board of Equitable Life in the United Kingdom was sued by policyholders for not using derivatives to hedge their massive exposures to interest rate movements.

2. Conglomerates: Financial institutions today are serving an economy that is becoming increasingly global and diverse. There are many big whales or financial conglomerates. To effectively manage the diverse business activities within these financial conglomerates, risk-based performance evaluation of business units becomes critically important. This often requires companies to develop internal enterprise risk models that firstly calculate the overall required economic capital and then allocate it to business units.

3. Regulation: Externally, there is a trend toward supervisory frameworks that contemplate ERM approaches that encompass all financial risks and assess the quality of internal risk management processes. Risk-based capital frameworks used by regulators and rating agencies also require an enterprise-wide approach. Large diversified companies have the incentive to develop enterprise risk models to justify a reduction in capital requirements.

Part 2. Many Faces of ERM

Integration vs. Specialization

By definition, ERM implies an integrated approach to risks. However, if we look at the history of economic development over the past centuries, “specialization” has been the key driver for advancements. In light of this observation, ERM is a specialization that takes a holistic approach to assessing and managing the major risks facing the enterprise. ERM will not replace existing specializations such as asset-risk modeling, credit-risk modeling, etc. Instead, ERM is a new specialization that coordinates the risk-taking activities of various business units, reconciles diverse perspectives and harmonizes different economic interests and incentives for the ultimate benefit of the enterprise.

Single vs. Multiple Perspectives

In today's highly developed economy, each of us is necessarily working on a small “part” or “specialization” of the jumbo economic machine. Day in and day out we form our views about something based on our specialized and limited experience and knowledge base.

It is our human tendency to “theorize” our observations. As a result, we constantly live with contradicting arguments, opinions and theories. Oftentimes we see years of endless debates that are merely two different viewpoints or perspectives of the same reality. Enterprise risks have many dimensions; if we collapse the dimensions, we get contradictory pictures.

Enterprise vs. Business Units

The ERM perspective may be a 30,000 feet view of the enterprise as a whole. When you get closer down to business units, you may learn that local views are quite different. One important aspect of ERM is to communicate to business units of the ERM perspective, while at the same time learn from business units about their local perspectives. A promise of ERM is in encompassing many perspectives and many dimensions. It is worth repeating—the ERM perspective should not be used to replace local “senses” and “expertise.”

ERM needs to harmonize goals between that of the enterprise and that of individual operating units. Using an insurance company as an example, the investment department may have the

best expertise in making profit from trading activities. The risk tolerance level needs to be established at the enterprise level, yet some flexibility needs to be given to the investment department to take advantage of market opportunities. Striking a good balance is not easy, but it is very important.

Short vs. Long Time Horizons

ERM will necessarily have a long-term time horizon. On the other hand, some managers have a much shorter time horizon than the enterprise, as they are often motivated by short-term bonuses. We have seen numerous cases in which some managers deferred recognition of losses and pre-spent tomorrow's money.

Part 3. ERM as an Evolving Science

How can we specialize in integration? How can we maximize enterprise value by empowering local business units, which may have different local goals? As we look at these contradicting aspects of ERM, we realize that the theoretical foundation for ERM is yet to be re-established. For pure investment activities, financial economics offers indispensable insights for ERM (e.g., asset allocation, portfolio optimization, dynamic hedging, etc). For non-investment activities, I think that the theoretical foundation for risk management has more to do with management science than financial economics. With ERM perspectives anchored around the overall goals of the enterprise itself, the advance of the ERM discipline requires a blending of financial economics and management science.

Misapplications of Financial Economics in ERM

I am quite concerned by some undue influence of financial economics on current ERM thinking. During the past two decades, financial economics has been the theoretical foundation for the explosive growth of the derivatives markets, which in turn has earned financial economics undisputable authority in the academic world. Financial economics, including CAPM and no arbitrage option pricing theory, assumes no frictional costs and information efficiency, and the only relevant risks to investors are systematic risks (non-diversifiable for the market as a whole). While these assumptions reflect some idealized states and approximate truth in some

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Editorial

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capital markets, they are far from reality when it comes to running an enterprise. It is exactly because of potentially large disruption costs in a non-ideal world that risk management becomes a necessity and of critical importance.

As a basic reality, every enterprise has its own set of relevant risks and its own core set of expertise. Unfortunately, this basic fact has been ignored by some people who blindly applied financial economic to ERM:

1) The financial economics type of thinking on “systematic risk” still dictates many aspects of ERM practices today. For instance, many companies are doing top-down economic capital allocations based on a giant covariance matrix where correlation parameters are guesstimates at best. By so doing, they are unknowingly using the top-down perspective to suppress many local perspectives that are most relevant to the local environment.

2) Historically, the blind application of portfolio theory misguided companies to “diversify” into new markets and business lines and they suffered big losses.

ERM Needs a New Portfolio Theory

We are called upon to expand the existing portfolio theory so that we can reflect an enterprise’s areas of expertise and frictional costs of doing business. First, it requires identifying the relevant risks to the enterprise and its business units, and then choosing appropriate risk measures in accordance with the relevant risks.

With a specific enterprise as our focus, ERM is concerned with the risks that are most relevant to the enterprise, which may be or may not be the same as the systematic risks to the market as a whole. ERM further recognizes that the set of relevant risks to a business unit can be quite different from that for the enterprise as a whole.

Pros and Cons of Diversification

After we have examined the relevant risks and areas of expertise, we can evaluate the risk

diversification effect within the enterprise. I would categorize the effects of diversification into the following four different levels:

- “Offset” produces the highest benefits, e.g., long and short position in financial assets. An implication is that hedging is the most effective diversification, provided the hedging cost is fair.
- “Random drivers” offer good benefits, e.g., natural catastrophe events in various geographic regions. Some specialized property catastrophe writers actively manage their portfolios through geographic and risk peril diversifications.
- Pooling of “expertise intensive” business may yield little or even negative risk diversification. For instance, different sectors (banking and P&C insurance) may be subject to different market dynamics and require different sets of expertise. It would be very difficult for the management to understand and manage both well.
- For large diversified (complex) conglomerates, there may also be legal “drags” due to the deep-pocket effect. There may also be “drags” of reputation spillover. These potential drags are in effect negative diversification benefits.

Multiple Risk Measures

Recognizing the fact that the set of relevant risks can be different among various business units, ERM necessarily employs multiple risk measures. Solvency measures at the enterprise level (say, 99 percent VAR or TVAR) should not dictate the pricing risk measures used at the lower unit level (e.g., the Sharpe ratio). It is understandable that companies desire a common yardstick for comparing risk-return performances of various business units. The reality is that most enterprises have both risk-taking functions and service functions. We need to go beyond traditional risk measures so that we can quantify the brand name and customer services, as they are determinants of the franchise value for the enterprise.

Value Creation

Value creation should be the hallmark of ERM, as it will be the ultimate thermometer for its degree of success. There are documented evidences that companies having sound enterprise-wide risk management have performed better than those not having it. However, quan-

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tifying the benefits of ERM can be difficult since they may not be immediately observable.

Being not readily quantifiable, the value of ERM has been perceived differently by company executives. In the past, some executives have shied away from establishing an ERM process in their companies since they view it only as another initiative that adds to the overhead but contributes nothing to the bottom line. Some companies attempted the ERM initiative but did not get very far because it was done incorrectly (e.g., lack of participation on the part of management). In the meantime, there are companies that practiced the ERM process and reaped huge benefits, as evidenced in their outstanding performances relative to their peers.

For the value of ERM, we can draw a modest analogy to physical exercise or medical treatment. If doing it right, regular physical exercise will bring good health benefits; the participant can definitely feel the benefits, even though it may not be readily quantifiable. Without regular physical exercise, there will be a higher chance of deteriorating health that would require medical treatment (crisis management).

ERM has many aspects of value creation:

1. Risk opportunities. Good companies consciously and constantly look for good risk (including arbitrage) opportunities. With the global perspectives of the enterprise and the markets it is in, ERM can help companies to identify good risk opportunities and avoid the danger of being arbitrated against.

2. Robust risk intelligence information. For example, forward-looking risk-return projections and gathering of relevant risk information are invaluable for making business decisions.

3. Alignment of incentives. Incentives are driving activities in organizations. Correctly aligning incentives with risk-based performance measures are essential for managing any large organization. Smart people will do the right (or wrong) thing when the right (or wrong) incentives are in place.

4. Cost reduction. For example, a) an enterprise-wide, activity-based cost/benefit analysis can help us identify managers who are expending their "kingdom" through massive spending;

b) Hedging programs can be managed at the enterprise level to reduce the hedging cost.

5. Better Coordination. We know many large firms have spent hundreds of millions of dollars on IT projects. Without knowing an enterprise's business needs or without adequate business people's inputs, these IT projects may not serve the business needs of the enterprise. They may even create unforeseen headaches for the business operations.



While the promise of value creation in ERM is great, its realization depends on ERM being understood, implemented and communicated correctly. I hope that more open discussions and sharing of best thinking can help fulfill the promise of ERM.

Concluding Remarks

I predict that the ERM discipline will go deeper to reflect better of the realities in our enterprises. The science of ERM will leap forward through combining analytical skills and business knowledge, and through blending the insights of financial economics with the tools of management science.

ERM is an exciting new field, and it is new for everyone, including financial engineers and actuaries alike. Actuaries possess the necessary technical risk-management skills on both the asset side and the liability side. These traits make actuaries excellent candidates for playing major roles in ERM for a variety of corporations. Actuaries need the courage to step forward and not be afraid to take on new roles and responsibilities. As a first step in this direction, actuaries need to become better versed in strategic, business and operational risk vocabulary. This is precisely the goal of the new Risk Management Section.

Invitation

On behalf of the Risk Management Council, I extend my sincere invitation to all of you to contribute your comments and observations. The most insightful feedbacks will be published in the upcoming newsletters. ♦

News Update

Newsletter Name Contest!

With the birth of the SOA Risk Management Section, the newsletter has become an important part of our section activities. We need a good name for our newsletter!

The Risk Management Section Council would like to invite members to submit name suggestions for our newsletter. Please send your name suggestions to Valentina (VIsakina@soa.org) at the SOA office no later than May 1, 2004.

The Risk Management Section Council shall review all suggested names and vote for the best to be chosen as the official name for the newsletter. The winning individual shall be announced in our next newsletter.

Congratulations from Former President Harry Panjer

by Harry Panjer



Harry Panjer, former SOA President

Having served as president of the SOA for the 2002-03 year, I am thrilled to be able to write a few words summarizing some of the SOA activities over the past year for this first newsletter of the Risk Management Section of the SOA. One of my proudest moments as president was to see the creation of the Risk Management Section. For the past two years, the SOA's Risk Management Task Force, under the very able direction of Dave Ingram, had already mobilized many actuaries into working groups. In order to solidify the SOA's commitment to risk management, I requested a group led by board member Mike McLaughlin to serve as a catalyst in getting a section set up. Well, it's done. It was done in record time. The section council was elected, is in place, has met and is already active! And the council selected Dave Ingram as its chair. Congratulations to Dave and the entire council.

In the recent review of SOA governance, the sections were recognized as the key drivers of SOA activity of direct relevance to members. The bottom-up nature of sections engages members where it counts. The Risk Management Section now has the opportunity to lead the growth of risk-management specialization amongst actuaries.

In recognition of the importance of risk management, the SOA Board also directed the Education and Examination Committee leadership to investigate the development of a specialty track in risk management in the FSA exams in order to expand specialized knowledge in risk management to new fellows. This is well underway. It will take the form of a specialty within the finance track.

Risk management is a burgeoning field in its own right outside of our traditional areas of practice. Other organizations, especially the Global Association of Risk Professionals (GARP) and the Professional Risk Managers' International Association (PRMIA), are vying to lead the whole risk management field. On another front, the accounting profession, in particular the AICPA, through the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in the USA, is proposing the accountants and auditors be responsible for all risk

measurement and management in all types of enterprises. They are proposing a framework for risk management that focuses very much on policies and procedures, monitoring, responsibilities and compliance. We, the actuarial profession, have addressed their proposal with correspondence from the Academy, the SOA and the Casualty Actuarial Society. We have pointed out that actuaries have been measuring and managing risk for a long time; we model it, we manage it and we use risk as an opportunity.

This past year the SOA and the CAS co-hosted the hugely successful risk management symposium in Washington. It was attended by many non-actuary risk managers, including leaders of PRIMA. We have committed to make it an annual event jointly sponsored with the CAS. PRMIA is also expected to play a key role in the coming ERM Symposium, April 26-27, 2004, in downtown Chicago.

This past year, the SOA also conducted a small meeting with prominent key risk managers—some were actuaries, some were not—to discuss strategies for creating more opportunities for actuaries in the risk management field.

This year, the SOA also created opportunities for actuaries to be more prominent in the risk management field. The electronic journal entitled *Financial Engineering News* is now carrying a regular feature entitled "Topics in Actuarial Analysis." Along with several other actuaries, I have published articles in this newsletter in the past year. The 2004 GARP Convention in New York featured an SOA-organized actuarial track as well as a one-day SOA-sponsored workshop.

We are also creating awareness of what actuaries do in risk management. Along with other actuarial organizations, the SOA is leading a public relations effort to promote the role of the chief risk officer in insurance and other financial institutions, as well as promote the skills that actuaries bring to this newly emerging role.

The new Risk Management Section now has the opportunity to be a leader in risk-management activity in the SOA. Go to it!! ♦

Insurer Solvency Assessment – Towards a Global Framework

by Stuart Wason, chair, IAA Insurer Solvency Assessment Working Party

A significant report on insurer risk assessment for solvency purposes is expected to be released publicly later this spring. The report entitled, *Insurer Solvency Assessment – Towards a Global Framework*, is currently available to all actuaries in the members-only section of the Web site of the International Actuarial Association (IAA) at www.actuaries.org.

The report was prepared by the IAA Insurer Solvency Assessment Working Party (WP) to:

- describe principles and methods to quantify total funds needed for solvency
- provide a foundation for a global risk-based solvency capital system consideration by the International for Association of Insurance Supervisors (IAIS)
- identify best ways to measure the exposure to loss from risk and any risk dependencies
- focus on practical risk measures and internal models

The WP members consisted of volunteers from around the globe, 20 in total. There were four WP members from Australia and Asia, eight from Europe and eight from North America. The WP contained strong representation from life, health, non-life, reinsurance, supervisory and academic backgrounds.

The IAA considers the report to represent useful educational material. The report is not intended to express a unique or absolute point of view with regard to the issues which surround the topic of insurer solvency assessment. The materials contained in the report will need to be enhanced over time in light of new developments. The report itself is supplemented with several appendices, including life, non-life and health case studies to illustrate the practical implementation of the principles developed in the report.

In the course of its mandate, the WP made several presentations on the work before a variety of insurance supervisory and professional actuar-

ial meetings. The WP met with the IAIS Technical Sub-Committee on Solvency and Other Actuarial Issues, the insurance internal market directorate of the European Commission, the Conference of European Insurance Supervisors, as well as numerous professional actuarial associations. Feedback from these presentations has been both positive and constructive.

To assist in the development of a global framework for insurer solvency assessment and the determination of insurer capital requirements, the WP proposes a number of guiding principles to be used in their design. These principles are summarized in the following paragraphs.

“Three Pillar” Approach

The WP believes that a multi-pillar supervisory regime is essential for the successful implementation of the global framework proposed in the report. The conclusions of the report are consistent with the three pillar approach to the regulation of financial service entities that is reflected in the Basel Accord for the regulation of banks internationally.

The approach envisaged would have three pillars consisting of:

- Pillar I:** Minimum financial requirements
- Pillar II:** Supervisory review process
- Pillar III:** Measures to foster market discipline

The definitions of these pillars need to reflect the specific features of insurance.

Pillar I (minimum financial requirements) involves the maintenance of a) appropriate technical provisions (policy liabilities), b)



Members of the IAA Insurer Solvency Assessment Working Party
(in alphabetical order)

Allan Brender (Canada)
 Peter Boller (Germany & Switzerland)
 Henk van Broekhoven (Netherlands)
 Vice-Chairperson
 Tony Coleman (Australia)
 Jan Dhaene (Belgium)
 David Finnis (Australia)
 Marc Goovaerts (Belgium)
 Burt Jay (United States)
 R. Kannan (India)
 Toshihiro Kawano (Japan)
 Sylvain Merlus (France)
 Glenn Meyers (United States)
 Teus Mourik (Netherlands)
 Harry Panjer (Canada)
 Dave Sandberg (United States)
 Nylesh Shah (United Kingdom)
 Shaun Wang (United States)
 Stuart Wason (Canada) Chairperson
 Hans Waszink (United Kingdom)
 Bob Wolf (United States)

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Insurer Solvency

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appropriate assets supporting those obligations and c) a minimum amount of capital (developed from a set of available and required capital elements) for each insurer. Of primary interest to the WP in the report are the capital requirements. To the greatest extent possible given the sophistication of the approach chosen and the insurer's ability to model them, it is the WP's view that these calculations must reflect a comprehensive view of the insurer's own risks.

Pillar II (supervisory review process) is needed, in addition to the first pillar, since not all types of risk can be adequately assessed through solely quantitative measures. Even for those risks that can be assessed quantitatively, their determination for solvency purposes will require independent review by the supervisor or by a designated qualified party. This is especially true for those determined using internal models. The second pillar is intended to ensure not only that insurers have adequate capital to support all the risks in their business, but also to encourage insurers to develop and use better risk management techniques reflective of the insurer's risk profile and in monitoring and managing these risks. Such review will enable supervisory intervention if an insurer's capital does not sufficiently buffer the risks.

Pillar III serves to strengthen market discipline by introducing disclosure requirements. It is expected that, through these requirements, industry "best practices" will be fostered.

The actuarial profession can assist supervisors within the second pillar by providing independent peer review of the determination of policy liabilities, risk management, capital requirements, current financial position, future financial condition etc., where these entail the use of substantial judgement or discretion. Assistance can also be provided within the third pillar in the design of appropriate disclosure practices to serve the public interest.

The WP believes that while customization of the individual pillars is needed as they are applied to insurers, the use of a three-pillar approach, similar to that used by the banks, makes sense and is extremely useful, given:

- the common features shared by the two financial sectors
- that many insurance supervisors are part of integrated financial supervisory agencies, and are well acquainted with the Basel Accord.

Some reasons for the differences in approach to be used for insurance would include 1) the nature of insurance risks and the techniques to assess them in Pillar I, 2) the need for multi-period review under Pillar II and 3) the definition of relevant information for purposes of disclosure in Pillar III.

Principles versus rules-based approach

Solvency assessment should be based on sound principles. Implementation of solvency assessment will require rules developed from these principles. However, the WP considers that the rules used should include provisions to allow their adaptation to current or unforeseen circumstances with the prior agreement of the relevant supervisor.

Total balance sheet approach

The application of a common set of capital requirements will likely produce different views of insurer strength for each accounting system used because of the different ways accounting systems can define liability and asset values. In the view of the WP, these definitions may create a hidden surplus or deficit that must be appropriately recognized for the purpose of solvency assessment.

The WP believes that a proper assessment of an insurer's true financial strength for solvency purposes requires appraisal of its total balance sheet on an integrated basis under a system that depends upon realistic values and consistent treatment of both assets and liabilities, and does not generate a hidden surplus or deficit.

Degree of protection

It is impossible for capital requirements, by themselves, to totally prevent failures. The establishment of extremely conservative capital requirements, well beyond economic capital levels, would have the impact of discouraging the deployment of insurer capital in the jurisdiction.

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The WP believes that a proper assessment of an insurer's true financial strength for solvency purposes requires appraisal of its total balance sheet on an integrated basis under a system that depends upon realistic values, consistent treatment of both assets and liabilities and does not generate a hidden surplus or deficit.

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In forming its recommendation for an appropriate degree of protection for insurer solvency assessment purposes, the WP considered the role of rating agencies in assessing insurers and the substantial volume of credit rating and default data available from these agencies. The WP also noted the relation between the degree of protection and the time horizon considered. In addition, the specific manner of applying the capital requirement risk measure may also affect the degree of protection chosen. The WP's recommendation for degree of protection is therefore linked with its recommendation for an appropriate time horizon for solvency assessment as shown in the following paragraphs.

Appropriate time horizon

A reasonable period for the solvency assessment time horizon, for purposes of determining an insurer's current financial position, is about one year. A longer time horizon of a few years (e.g., perhaps five years for life insurance and two years for general insurance) may be a reasonable period for assessing an insurer's future financial position. This assessment time horizon should not be confused with the need to consider, in such an assessment, the full term of all of the assets and obligations of the insurer.

The WP recommends that capital requirements be determined in a manner consistent with the overall goal for the confidence level of Pillar I capital requirements. Specifically, the WP recommends that the greater of two measures be held.

a. The amount of required capital must be sufficient with a high level of confidence, such as 99 percent, to meet all obligations for the time horizon as well as the present value at the end of the time horizon of the remaining future obligations (e.g., best estimate value with a moderate level of confidence such as 75 percent).

b. Due to the long-term and complex nature of some insurer risks, the insurer should consider valuing its risks for their lifetime using a series of consecutive one-year tests with a very high level of confidence (say 99 percent) and reflecting management and policyholder behavior (but no new business). Alternatively, this test can be conducted with a single equivalent, but lower (say 90 percent or 95 percent), level of

confidence for the entire assessment time horizon. This lower level of confidence over a longer time horizon is consistent with the application of a series of consecutive higher level one-year measures.

Types of risk included

In principle, the WP recommends that all significant types of risk should be considered (implicitly or explicitly) in solvency assessment. However, there may be valid reasons why certain risks do not lend themselves to quantification and can only be supervised under Pillar II. The WP believes that the types of insurer risk to be addressed within a Pillar I set of capital requirements are underwriting, credit, market and operational risks.

Appropriate risk measures

A risk measure is a numeric indicator that can be used to determine the solvency capital requirement for an insurance company. The most appropriate risk measures for solvency assessment will exhibit a variety of desirable properties (e.g., consistency). Of course, it is difficult for one risk measure to adequately convey all the information needed for a particular risk. One risk measure that exhibits several desirable properties for various (but not all) risks is tail value at risk (also called TVAR, tailvar, conditional tail expectation, or even policyholders' expected shortfall). In many situations, this risk measure is better suited to insurance than value at risk (VAR), a risk measure commonly used in banking, since it is common in insurance for their risk event distributions to be skewed.

Risk dependencies

The solvency assessment method should recognize the impact of risk dependencies, concentration and diversification. This has implications for the desirable properties of the appropriate risk measure.

Risk dependencies within an insurer can have a very significant impact on the overall net effect of its risks (compared to the gross effect without taking account of their dependencies). Even the most basic fixed-ratio method should implicitly allow for risk dependencies. Currently,

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Insurer Solvency

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required capital formulas in Japan and the United States incorporate some recognition of dependencies, concentration and diversification. However, in many countries, diversification between different risk types is not recognized in the formulas for required capital.

Risk management

The solvency assessment method should appropriately recognize the impact of various risk transfer or risk sharing mechanisms used by the insurer. Some of the ways in which an insurer can manage its risks, beyond the fundamentals of prudent claim management, include:

- risk reduction
- risk integration
- risk diversification
- risk hedging
- risk transfer
- risk disclosure

While many of these types of risk management serve to reduce the risk in question, it is important to note that some of them create additional risk related to the technique itself. For example, both hedging and reinsurance create counterparty risk, which is a form of credit risk.

Regardless of the risk-management process used by the insurer for its risks, including full retention of its risks, effective management of these risks is encouraged by appropriate disclosure of the extent of the risks and their management by the company. Appropriate audiences for such disclosure include the stakeholders of the insurer including the supervisors.

Standardized approaches

Many of the discussions comparing different solvency assessment methods (e.g., fixed-ratio versus risk-based capital (RBC) versus scenario-based, etc.) do not adequately explain the optimum conditions that must be present for each method to be reliable. Supervisors considering new methods should be alerted to the conditions needed for the new methods to be a success.

Simple risk measures are appropriate when it is recognized that the risk in question is important

from a solvency perspective but a generally accepted view of how the risk should be assessed does not currently exist. They are also appropriate if the risk is of minor importance.

Sophisticated risk measures are appropriate for material risks where one or more of the following conditions exist:

- the risk in question is very important from a solvency perspective and cannot be adequately assessed through the use of simple risk measures
- there is sound technical theory for the risk to be assessed and the risk measure to be used
- sufficient technical skills and professionalism are present among the staff
- relevant and sufficient data is present or the knowledge about the risks is otherwise reliable
- the risk is actually managed in accordance with the risk measure used
- risk management practices are evident to a high degree

Advanced (company-specific) approaches

For stronger, more technically able companies with effective risk-management programs, it may be appropriate to introduce advanced (or company-specific) models that can incorporate all types of quantifiable risks. An internal model can also incorporate all types of interactions among risks if those interactions are understood and quantifiable. However, in practice, many aspects of risk are not well understood, particularly in the case of extreme events for which little history exists (and that are most important for solvency assessment). Hence, internal models provide a model of risks faced by an insurer that can, at best, be described as representing reality in an approximate way. In building an internal model, care must be given to capture the most important risk variables.

Required capital can be thought of as a second line of defense protecting an insurance company's solvency and its policyholders. The first line of defense is solid risk management. If trouble develops that cannot be prevented through management of a risk, then capital should be available to cover the financial losses

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“
Risk dependencies within an insurer can have a very significant impact on the overall net effect of its risks (compared to the gross effect without taking account of their dependencies).
”

Risk Management of a Financial Conglomerate

by Luc Henrard, chief risk officer Fortis
and Ruben Olieslagers, head of research and development

1. A NECESSITY

The emergence of large European financial groups has been one of the principal features of the latest banking and insurance consolidation wave. Financial deregulation, globalization of financial markets and increased shareholder pressure for financial performance are the main forces that fueled the mergers and acquisitions trend over the past few years. In order to measure, monitor and manage risk and ultimately optimize risk versus return within a conglomerate at both operating entity and aggregate group level, the financial conglomerate needs excellent risk-management processes and internal control mechanisms. This should also be encouraged by the regulatory structures, which are unfortunately still largely focused on individual operating entities within a group and treat each of these as independent silos in setting capital requirements. This silo approach fails to deal adequately with aggregate risks across different regulated businesses.

Accurate and consistent risk measurement is a prerequisite for good risk management. Risk measurement typically starts bottom-up in the different businesses within a financial conglomerate. As a result, many different approaches to risk measurement have been developed between insurance and banking businesses and even within each of these areas (e.g., life and non-life insurance). For a financial group, especially a conglomerate covering many business areas, arriving at a common risk measure is quite a challenge.

Externally too, the growing emergence of financial conglomerates and the blurring of distinctions between the activities of firms in each financial sector had also increased the need for joint efforts to improve the efficacy of supervisory methods and approaches. Basel II has focused on improving consistency and accuracy of setting solvency requirements across banking businesses and now Solvency II will aim to do the same for insurance. A key aim of the regulatory bodies is also to develop a

consistent view on risk measurement across the entire financial services industry. The Joint Forum (formerly known as the Joint Forum on Financial Conglomerates) has been a focal point of the efforts of the international supervisory community in meeting this need.

The concept of “Economic Capital,” which measures risk based on a company’s own unique risk profile, is developing as the common measure of risk, sought by many financial conglomerates as well as regulatory bodies. Economic capital enables financial institutions to establish a capital framework that allows for consistent translation of risk taking into capital requirement, making “apples-to-apples” comparisons possible. An economic capital framework does not only allow for the capture of netting and diversification effects within a financial conglomerate, it also addresses many of the current limitations of regulatory capital models (e.g., silo view, standardized risk modeling approaches).

2. THE INTERNAL CHALLENGE: SIX STEPS

The development of comparable measures of capital and value is not an easy task. Fortis, as a bancassurance group facing a wide range of risks, has applied the following six-step approach:

- Define and communicate your risk taxonomy
- Make sure banking and insurance officers understand each other
- Define the models to be used for each risk type (business, event, credit, etc.) in a consistent way
- Model each risk and aggregate to arrive at an overall capital figure
- Define a regulatory solvency corridor
- Look at the risk/return “Framework”



Luc Henrard is general manager and chief risk officer of Fortis in Belgium. He can be reached at Luc.Henrard@fortis.com



Ruben Olieslagers is Head of Research and Projects at Fortis Central Risk Management. He can be reached at ruben.olieslagers@fortis.com

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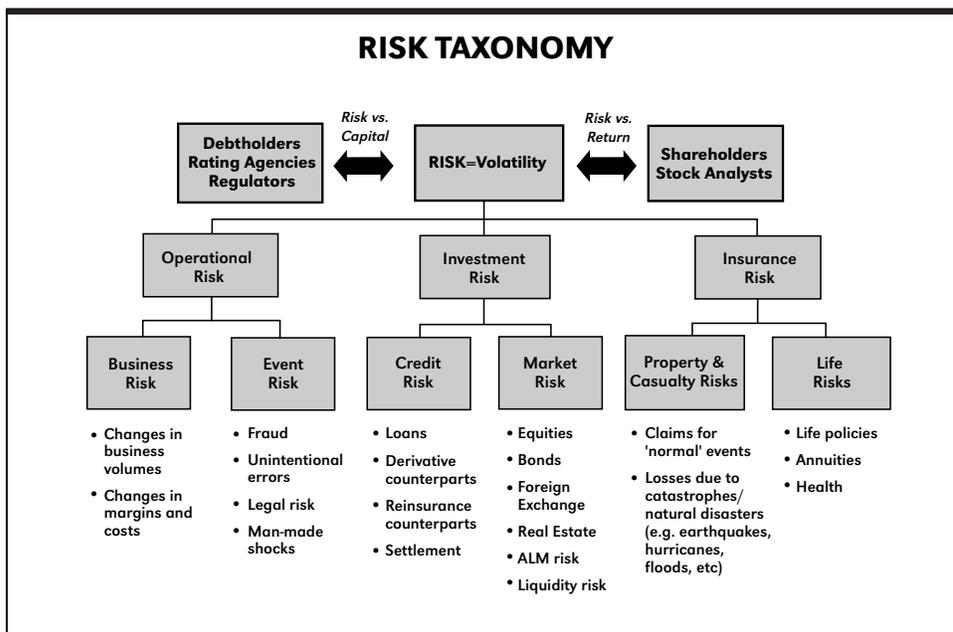
Financial Conglomerate

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Step 1: Define and communicate your risk taxonomy

Many different ways of classifying risk are possible, and no single taxonomy is inherently better than another. The classification of risk types often follows the relative importance of risk types to a financial services provider. The risk taxonomy used at the level of Fortis Group seeks to establish a common risk language across the group, while ensuring that all risk types are adequately captured. Figure 1 distinguishes six broad types of risks.

Figure 1



1. Investment risk

- **Credit risk:** the risk that a borrower/counterparty will fail to repay the amount owed to the Fortis Group.
- **Market risk:** the potential for loss resulting from unfavorable market movements (from trading to holding positions in financial instruments). Market risk might be treated as one aggregated risk or separately as interest rate, equity, foreign exchange, real estate and commodity risk. Within market risk we identify ALM risk. Fortis Group is exposed to interest rate, share price and real estate risk via its investment portfolio. Credit risk and market risk are measured separately because the distribution for credit risk (low frequency, high sever-

ity correlated loss) differs significantly from the distribution for market risk (high frequency, low severity).

2. Insurance Risk

- **P&C risk:** the variability in future claims and loss-adjusted expenses (LAE) paid (whether in size of claims, number of claims or timing of payments) and the variability in the liabilities for outstanding claims overtime.
- **Life risk:** the risk exclusively associated with a life insurer. The risk is especially the result of deviations in timing and amount of the cashflows due to the (non-) incidence of death.

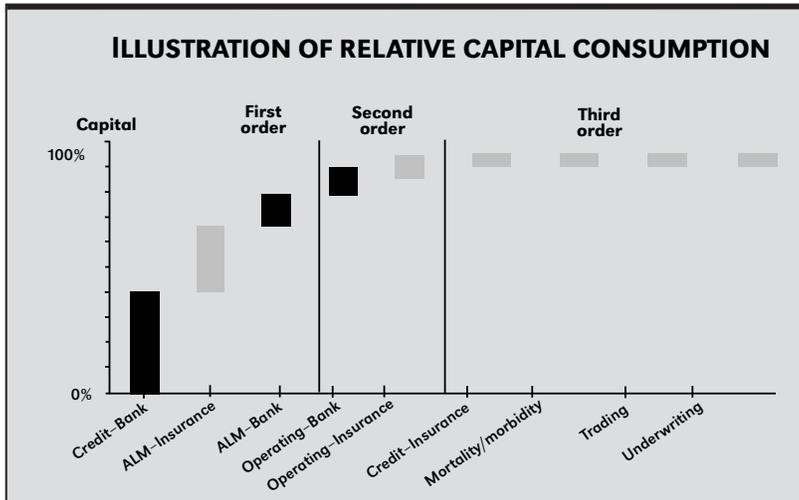
3. Operational Risk

- Business risk refers to the risk due to operating leverage (in particular, volatile revenues and an inflexible expense base).
- Event risk refers to the risk of experiencing one-off adverse non-financial events such as fraud and punitive damages.

Given that a financial conglomerate is by definition a combination of diverse businesses operating under a common ownership structure, each of these has a distinct risk profile. From this point of view, an ordering of risks in function of the consumption of economic capital is required, taking into account the fact that a conglomerate must not be overcapitalized to the point where it would cause undue harm to shareholders or undercapitalized to the point where it would cause undue risk of insolvency to debtors and policyholders. In other words, lower capital for a given degree of risk taking will make an institution less solvent, but more profitable, and vice versa.

Figure 2 gives an illustrative example of ordering and is therefore not valid for every business within a financial conglomerate because it depends on the relative importance of each of the banking and insurance businesses within the conglomerate. In general, universal banking activities are mainly dominated by credit risk, but this is not the case for life insurance activities. ALM is invariably the largest consumer of capital in insurance companies (especially in life) given that insurance risks diversify away in large portfolios. P&C activities are mainly dominated by insurance risk while the non-licensed subsidiary encounters operating risk. Insurance risks (mortality and underwriting)

Figure 2



will diversify away substantially in large portfolios because they are not correlated with the other (financial) risks and because a lot of the volatility is already reserved in the provisions.

Step 2: Make sure banking and insurance officers understand each other

Step 2 consists of improving the understanding by bankers and actuaries of mutual approaches and terminology. Figure 3 summarizes the typical banking and insurance approaches. The dissimilarities are substantial, mainly because of the differences in the dominant risk types that have traditionally been faced. Furthermore, banks tend to have assets that are difficult to value, whereas insurance companies have uncertain liabilities. Both also use very different valuation principles. Thus, in order to make sure that banking and insurance understand each other, knowledge sharing and communication efforts should be an important issue in a financial conglomerate.

Step 3: Define the models to be used for each risk type (business, event, credit, etc.) in a consistent way

Step 3 defines the models to be used for each risk type in a consistent way. Those risk types are credit, market, ALM, life, P&C, business and event risk. A common risk measurement framework is the prerequisite to an effective measurement and management of risk and used capital. To construct a common risk language across the whole of a fi-

ancial conglomerate, differences in the sector-specific frameworks should be identified and, agreement should be reached consistently covering all relevant risks. For example, one of the key challenges in a conglomerate is specifying a uniform time horizon.

In banks, the convention for modeling risks and assessing capital is to adopt a one-year horizon. Alternatively, insurance companies are typically capitalized for longer decision horizons. In order to have a “common currency” for risk, a com-

Figure 3

DIFFERENT APPROACHES USED IN BANKING AND INSURANCE		
	Banking	Insurance
Terminology	<ul style="list-style-type: none"> Expected loss Rating masterscale VAR RARORAC 	<ul style="list-style-type: none"> Claims Mortality tables Fair Value Embedded Value/Risk Based Capital
Focus	<ul style="list-style-type: none"> Risk One-year 	<ul style="list-style-type: none"> Expected outcome Multiyear
Weaknesses	<ul style="list-style-type: none"> Insufficient use of statistics Customer behavior 	<ul style="list-style-type: none"> Insufficient use of modern finance theory (in some countries) Little use of transfer pricing (ALM)

mon time horizon needs to be specified, at least at the group level where risk aggregation across banking and insurance takes place. Another example is the translation of the one-tailed 99 percent confidence interval for trading risk or 95 percent confidence interval for specific actuarial risk into a 99.97 percent confidence level, which is applied to be in line with the Fortis “AA” calibration.

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Step 4: Model each risk and aggregate to arrive at an overall capital figure

Step 4 defines the model for each risk in terms of the amount of value they put at risk to a certain confidence limit determined by the target debt rating. For

Figure 4

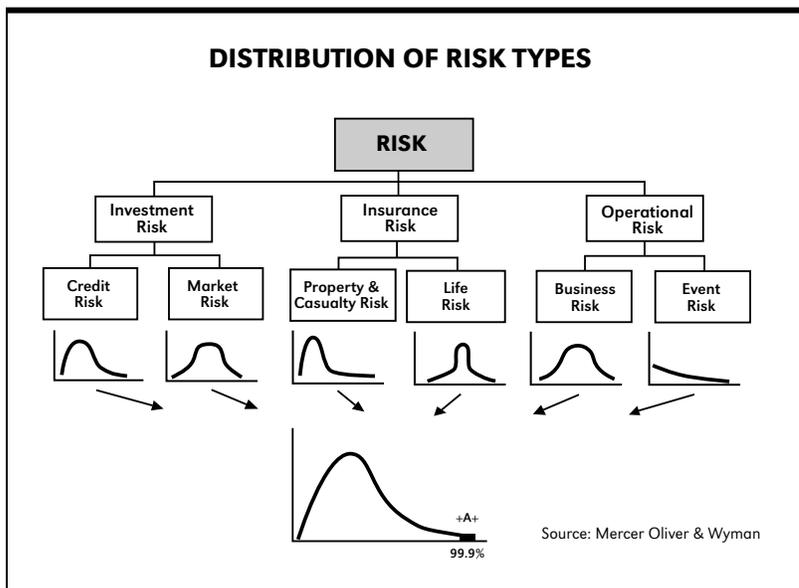
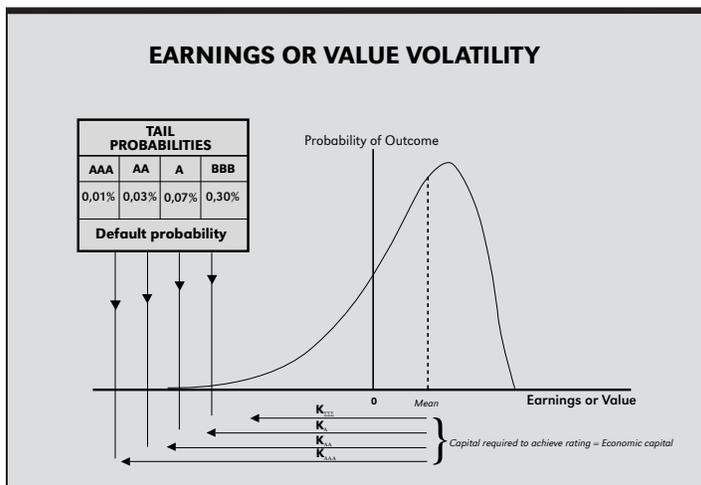


Figure 5



99.97 percent) can be derived from the tail of the probability distribution. The distribution illustrated in Figure 5 represents the probabilities of various earnings outcomes from a loan portfolio over a one-year time horizon against which capital must be held in accordance with the desired rating.

The process to determine how much capital is required in a financial conglomerate can be presented schematically as in Figure 6 (see next page).

Clearly, the probability that the sum of all stand-alone capital requirements fails to cover losses for all risk types simultaneously is lower than the probability that only one or a few capital requirements for a risk type fall short of covering losses attributed to the risk type. We are interested in computing an aggregate capital requirement figure for the group that will cover potential group losses up to the desired group confidence level equivalent to an AA-S&P debt rating. We would clearly overestimate group capital requirements if we were to add up all the stand-alone capital requirements, since that would lead us to a much higher confidence level than anticipated.

Instead of adding the stand-alone capital requirements directly, we must aggregate them considering the tendency for co-movement among losses for each of the risk types. If we know to what degree the losses related to a particular risk type tend to follow the losses related to other risk types, we can compute an aggregate capital requirement figure for the group to protect against all losses up to the desired confidence level.

Within these aggregation steps, diversification is taken into account via a set of correlation estimates. Empirically, diversification effects are greatest within a single risk factor (Level 1), decrease at the business level (Level 2) and are smallest across business lines (Level 3). Recent estimates suggest that the incremental diversification benefits achievable at Level III by combining a bank with an insurance company are on the order of a 5-10 percent reduction in capital requirements.

Diversification is a complex issue and it is understandable that regulators are wary of allowing financial companies to take significant

Fortis, therefore, economic capital is defined as the amount of value at risk to a 99.97 percent confidence limit (based on a AA target debt rating). It is calculated by estimating the fair value now and comparing it

with the fair value in one year's time under a 99.97 percent worst-case scenario for each risk. One should be aware that it is not that easy to determine the distribution of a risk type because, among other things, a great deal of data is needed. Figure 4 illustrates that a different risk distribution is possible for every risk type.

Within Fortis, the stand-alone capital requirements for each of several risk types quantify the value at risk for each risk type up to an AA confidence level over a one-year period. The economic capital (after having quantified the level of risk) to achieve such a particular level of solvency (e.g., AA rating—

benefit until there is greater convergence on how it should be measured and managed. However, we would argue that there is a very important distinction between netting effects, where the same risk can be shown to impact different parts of a group in equal and opposite ways (e.g., interest rate risk in banking and life insurance pools), as well as general diversification. Netting should therefore be analyzed separately from more general diversification effects and as we believe, should be recognized in terms of the impact it has on solvency requirements.

Once the correct group-wide capital figure has been computed, it must be re-allocated back to risk types and business lines. However, since the group figure will be smaller than the sum of the stand-alone figures, a tailored disaggregation methodology is required.

Step 5: Define a regulatory solvency corridor

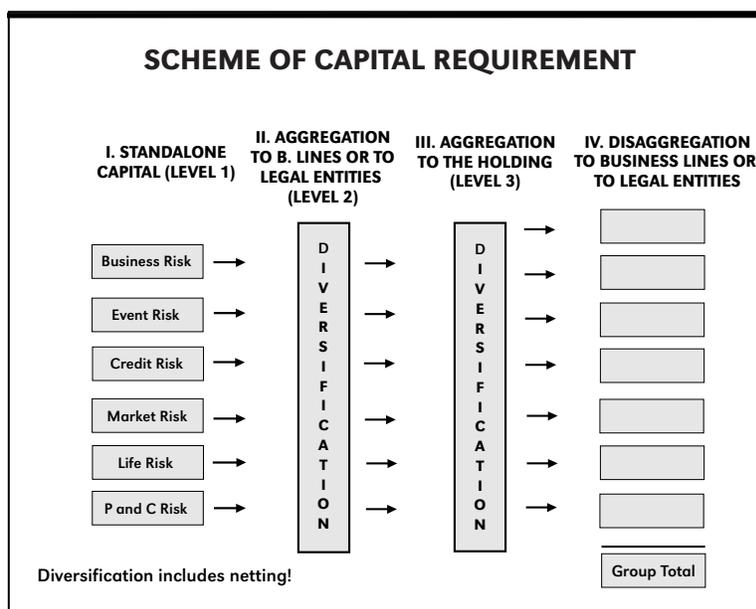
In step 5 the focus is put on the regulatory solvency requirements and the definition of a solvency corridor. Fortis has formulated a framework for regulatory solvency that defines an upper and a lower limit of core capital. The minimum limit is based on the sum of 6 percent of the bank's risk-weighted assets and 1.75 times the statutory minimum requirements for the insurance sector. The upper limit comprises 7 percent of the bank's risk-weighted assets and 2.5 times the statutory minimum requirements for the insurance industry.

We also note, in addition to the regulatory and economic capital we already have discussed, that rating agency requirements can not be ignored. This therefore leads us to consider four views of capital that a financial conglomerate should take into account.

• **Regulatory minimum capital:** the amount of capital to meet the capital adequacy ratio stipulated by the regulators to ensure that banks maintain a certain amount of capital in relation to their assets as a cushion against probable losses. These are currently based on undifferentiated rules of thumb (Basel I, Solvency I) that do not reflect the real economic risks of the business, but Basel II and Solvency II have the intention to change this to a certain extent.

• **Solvency corridor floor:** a minimum level of capital Fortis should have. The floor is created to provide an easily understandable and computable reference point for capital management. It is derived from the regulatory approach and it can encompass bank and insurance issues with specific regulatory and rating constraints. The Fortis floor for banking is computed as 4 percent of RWA * 150 percent; for European insurance it is total capital required * 175 percent.

Figure 6



• **Economic capital:** the amount of capital required to cover all the risks faced by a business, analyzed from an economic point of view rather than a regulatory or accounting view. Economic capital is calculated in house using internal data and methodologies. As a result it should be more robust (i.e., reflects the true risks in a more tailored fashion) than any other capital metric.

• **Rating agency driven capital:** the amount of capital that the rating agencies expect in order to feel comfortable about giving a certain rating. Given the rough rules of thumb used by regulators to establish regulatory capital requirements and their lacking differentiation for the qualitative level of capital adequacy, rating agencies have, in some cases (mainly insurance), developed their own capital models. One

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also needs to keep in mind that the rating agencies' decisions on a credit rating are not only based on quantitative considerations or hard factors but also based on qualitative factors, such as risk control and management capabilities.

Step 6: Look at the risk/return "Framework"

In step 6 we have to look at the risk/return "framework." The accounting view is focused on return-on-assets (ROA) and return-on-equity (ROE). The regulatory view (Basel I, Basel II, Solvency II, etc.) is working with return-on-required-equity (RORE). The risk manager view uses concepts such as risk-adjusted return on capital (RAROC). These metrics measure both the return and the capital required on a risk-adjusted, i.e., economic basis, and hence can be viewed as the economic equivalent of the accounting-based ROE profitability measure.

For the insurance operations the risk-return trade-offs are analyzed in the dynamic ALM models. In such a model one can test different

bonds, "atypical" investments (CDO and other structured products) and dynamic hedging strategies in such a framework. The objective is always to push the efficient frontier to the "Northwest" where you'll get more return with less risk.

Figure 7 is an illustration of an efficient frontier analysis for one particular block of group life business. The context is value-based, where return (Y-axis) is associated with the expected increase in value over one year, and risk (X-axis) is defined as the ALM economic capital of that block of business. ALM economic capital can be seen as a multiplier times the volatility of the changes of fair value over a one-year horizon. The figure below ALM economic capital is expressed as a percentage of the underlying technical provisions. This is to compare the economic capital requirements with those used in rating agency models, by regulatory bodies and risk-based solvency frameworks.

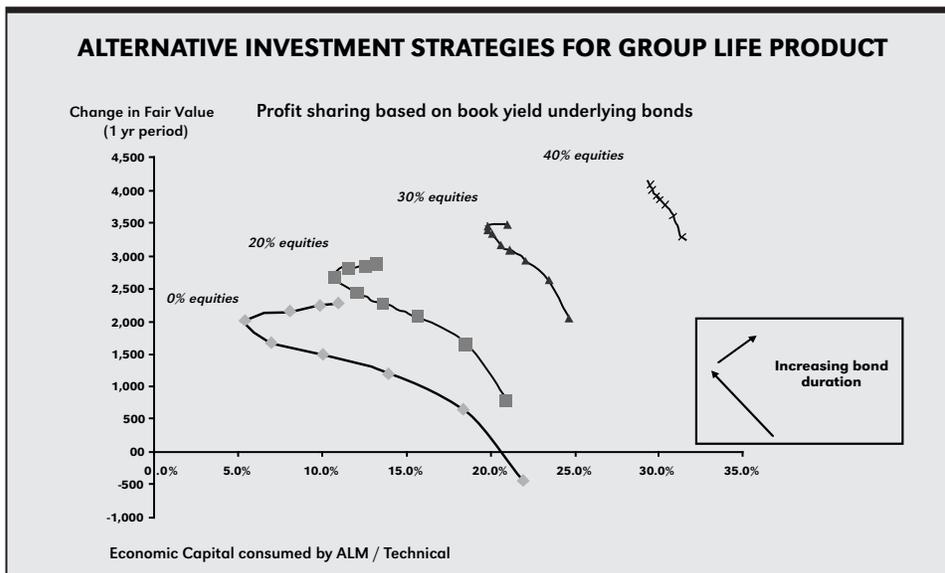
Figure 7 shows, for this particular product group and for a fixed percentage of equities in the asset mix, that by increasing the duration of the fixed income portfolio we move to the Northwest (less risk more expected return) up to a certain duration. From there, increasing the duration leads to more expected return and more risk. If we increase the percentage of equity investments in the asset mix, we generally increase both expected return and risk (move to the Northeast). Internal studies within Fortis show that the shape of the efficient frontiers depends very much on the underlying interest rate position (asset minus liabilities) in the product group. For this group life product the "optimal" amount of equities in the asset mix depends on the risk appetite of the companies selling the product and, in practice, also on the competitive pressures in the local insurance market.

Within Fortis, the application of these different steps to fix the performance measurement is summarized in the two following schemes.

For the bank pool:

- Risk adjusted return = revenue - expenses - EL + capital benefit.
- Economic capital is fixed separately for credit, ALM, trading and operational risks.

Figure 7



asset mixes via a comparison of return and risk in both an earnings and a value-based context. The traditional asset classes in such a framework are equities, bonds and real estate. A major challenge is to incorporate corporate

Figure 8

For the insurance companies:

- Return = premiums + investment income + release of reserves - claims - expenses + capital benefit.
- Economic capital is fixed separately for credit risk, ALM risk, operational risk, life and non-life.

3. HOW TO PRIORITIZE THE BUSINESS APPLICATIONS

Leading banks and insurance companies deploy portfolio management, economic capital and RAROC in a wide variety of applications (see Figure 8).

“Top-Down” Applications: the group will monitor risks as they are assessed at the portfolio level.

1. Reserve and capital adequacy testing

The financial system has witnessed considerable economic turbulence over the last five years. While these conditions have generally not been focused on G-10 countries directly, the risks that financial conglomerates have had to deal with have become more complex and challenging. Financial institutions should frequently test and monitor reserves and capital adequacy, and within Fortis significant resources are put in place in order to measure capital adequacy from different points of view.

2. Limit setting

Counterparty exposure limits are set to constrain the maximum impact of any single default on the capital base of a financial conglomerate. Portfolio risk models allow the calculation of the risk contribution of individual counterparties or subportfolios taking into account the (un)expected losses, correlation effects and thus the economic capital. If risk contributions of certain counterparties are high, senior management could decide to set limits for approval of additional credits to these counterparties. In a financial conglomerate it is important to apply the “one obligor” principle which implies that one global vision of all risks on one obligor throughout all entities (no matter the location) and risk types (no matter the nature of the underlying risk) should be taken into account.

3. Portfolio optimization: buy/sell/hedge decisions

The portfolio managers can optimize the portfolio by using buy, sell or hedge strategies by

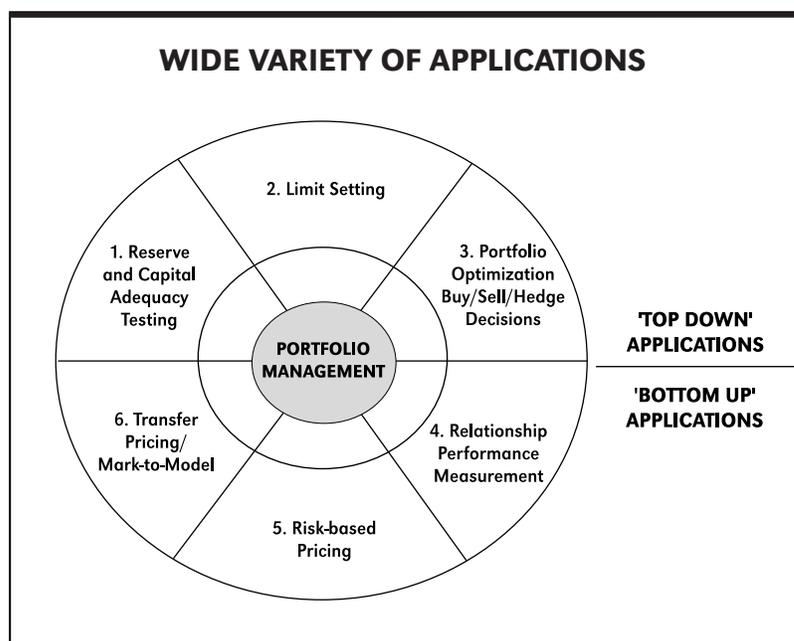
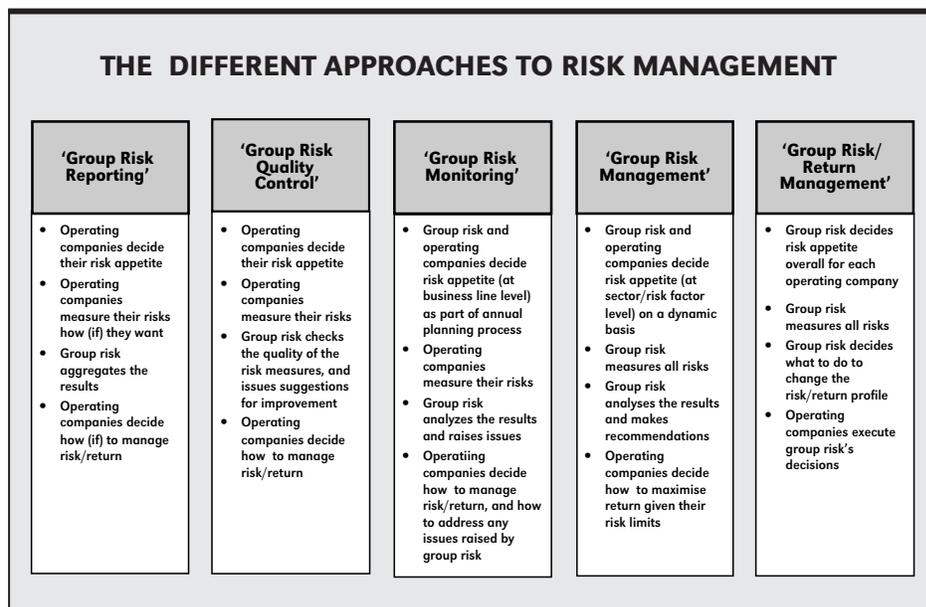


Figure 9



means of secondary loan market, syndicated lending, credit derivatives and asset-backed securities such as CLOs (collateralized loan obligations).

“Bottom-Up” Applications: local businesses develop and recommend methodologies of risks as they are assessed at the individual asset level.

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4. Relationship performance measurement

Financial institutions have to adapt their organization and their incentive systems in order to be successful in the future. Management must have the incentive to use risk information to support better decision making. The performance of the relationship of a client or relationship manager should not solely be evaluated on revenue and revenue growth rates. The recognition of capital utilization and return on capital are also important.

5. Risk-Based Pricing

Rarely do prices consistently reflect risk. Risk measurement techniques, in credits for example, can be applied to analyze and price transactions against the expected loss and required economic capital. On the one hand, the narrowing profitability of traditional credit products implies little room for error either in selecting or in pricing individual transactions. On the other hand, the relative attractiveness of other less traditional but higher margin credit businesses, such as project or trade finance can only be evaluated by taking into account not only their margins but also their potential impact on the risk of the portfolio. Although the use of internal credit rating models to support the pricing and classification on a masterscale is a step in the right direction, it is not sufficient. It is also important to look at a portfolio level because diversification and timing effects increasingly lead to the difference between profit and loss.

6. Transfer Pricing

Transfer pricing, or the price at which one unit of a firm sells goods or services to another unit of the same firm, should truly reflect arm's-length prices or the prices at which a willing buyer and a willing unrelated seller would freely agree to transact. Banks, for example, use risk management tools to transfer banking book exposures to the trading book where possible in order to hedge interest rate risks internally. For insurance companies, basically a comparable approach is used via replicating portfolios. Unlike banks, life insurance company liabilities are intertwined with assets, but this should not prevent the company from tracking the performance of assets and liabilities.

Strategic decisions concerning the relative balance between corporate and retail banking activities can achieve long-term structural shifts in interest rate risk exposures as well. However, there are limits on how many banking book exposures can be transferred to the trading book. When interest rate risk is transferred to the trading book, usually through transactions that resemble money market transactions, internal transfer pricing mechanisms are used to determine the amount of risk that has shifted between books. These pricing mechanisms are highly institution-specific. In addition, these mechanisms do not transfer embedded options and basis risk.

4. FORTIS RISK MANAGEMENT STRUCTURE

In order to organize an adequate risk management structure, the link between central risk management and local risk management (within operating companies) should be clearly defined. From this point of view, the following question arises: Who is in the driver's seat in the measurement and management of the risks and returns of each of the activities at a stand-alone and aggregated level?

Although the answer to this question will be partly influenced by the corporate governance of Fortis, there are two basic principles that will always hold:

1) Whether you are at the helm of a bancassurance group or a financial holding (with stakes in banks, life or P&C insurance companies), you must rely on an integrated risk-management framework throughout the whole organization (consistent risk-measurement techniques, consistent policies: What is my real profile? What is the impact of my asset mix on my risk-return? How do I monitor and control risk?)

2) The legal structure may evolve over time (from one bank and many insurance companies to one bank and one insurance holding or even to one company). It does not matter from a risk point of view because we have based our risk organization structure on the principle of "Russian dolls" (from the bottom to the top: business risk committees; central risk committee(s) for the bank and the insurance(s); the Fortis Risk Committee at group level).

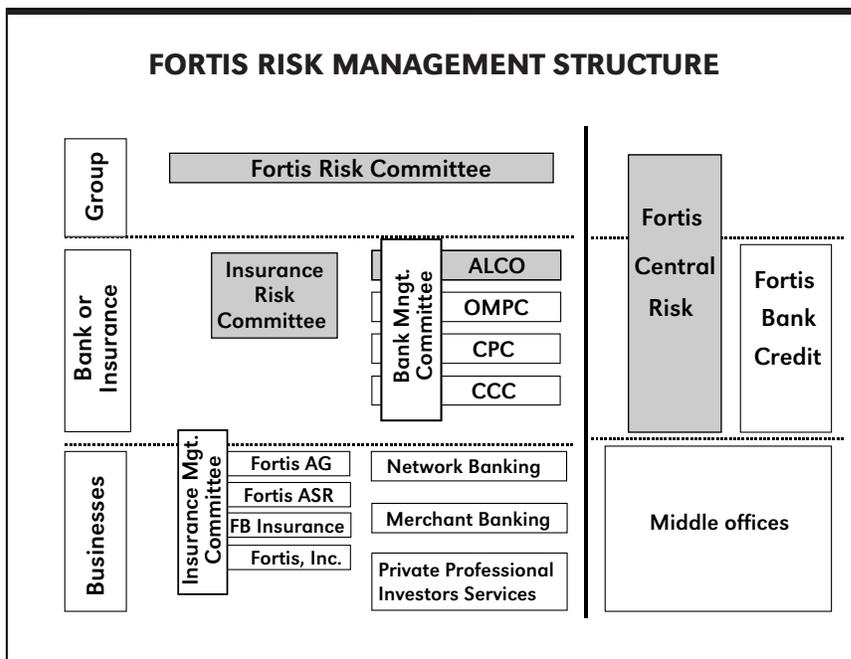
“ It is clear that the definition of regulatory capital differs greatly between banking and insurance environments. ”

Although we advocate an integrated risk structure, it is up to the financial conglomerates to choose between a centralized or decentralized approach. In Figure 9 we describe the different approaches on how you could organize your structure. Fortis is currently applying the “Group Risk Management” approach.

Figure 10 summarizes the Fortis Group approach in more detail. The risk organizational framework was created to ensure coherent decision making between the business and group level. Over time, Fortis’ banking and insurance operations have developed risk-management practices, which support local and tactical decision making. The group objective, however, is to build group-wide harmonized risk-reporting and risk-management structures, which not only integrate practices existing at the individual banking and insurance level, but also upgrade the overall approach to include state-of-the-art quantitative risk-management techniques. At the group level, a central risk-management function has been created, reporting directly to Fortis’ CFO. At the business level, each business is responsible for managing its risks and ensuring that it has in place excellent risk management covering the full risk taxonomy. This includes acting within the risk policies, guidelines and limits, proactively identifying, monitoring and managing all of its risks, holding sufficient reserves to cover liabilities, etc. All these activities are under the overall coordination of Fortis Central Risk Management, which:

- helps to ensure the group has and can demonstrate that it has consistently high standards of risk management;
- encourages risk/return optimization;
- supports the work of the bank and the insurance risk committees and coordinates the implementation of risk initiatives;
- provides support to the businesses on risk-related issues;
- measures economic capital group-wide;
- validates the risk models developed by the businesses and by the bank’s credit department;
- coordinates risk communication with regulators, rating agencies, etc., with the exception of credit risk in the bank, which is communicated through central credit management;
- measures and monitors the ALM risk in a consistent way, across bank and insurance.

Figure 10



5. BANKING AND INSURANCE CAPITAL: HIGHLIGHTING SOME DIFFERENCES

The purpose of an economic capital/solvency project is to arrive at the capital requirements of the group based on the risks taken. This basic principle is not easy to implement, taking into account the different definitions of capital (as mentioned above).

Figure 11 shows the fundamental differences on five crucial items between banks and insurance companies.

Following are two examples that show the impact of some of the previous items:

Example 1: the capital requirements for "A" rated credit risk

- Banking regulation (Basel I) 8 percent (minimum 4 percent must be Tier 1).
- U.S. insurance P&C (NAIC RBC): 0.3 – 1.0 percent for investment grade credit.
- EU life insurance: no explicit focus on credit risk.

It is clear that the definition of regulatory capital differs greatly between banking and insurance environments. One step in the right direction consists of the more risk-sensitive re-

continued on page 22

Financial Conglomerate

▶ continued from page 21

quirements set by the New Basel Accord. This trend can also be observed in the insurance industry (see Solvency II). These trends will most likely bring regulatory requirements much closer to economic capital.

Example 2: Another example of a regulatory mismatch is found in the area of financial guarantees and their counterpart in the insurance world—credit insurance. Certain types of guarantees are treated as insurance business if written by insurance but as banking business if

Figure 11

A GAP BETWEEN BANKS AND INSURANCE COMPANIES

	Basel 2 Requirements for Banks	Statutory Reserves for Insurance Companies	Economic Capital Consumed by a Bancassurer
Confidence interval	A? / BBB ?	None	Shareholder's decision
Base Line	Statutory solvency	Statutory solvency	Economic solvency
Valuation	Statutory	Statutory	Fair value
Risk type coverage	Excludes Business risk as well as most of the ALM risk (the Banking Book)	Excludes Event Risk	All risk types
Diversification	?*	?**	Yes

* Market risks are highly correlated with credit risk. It is not the case however for operational risk.

** The existing European insurance capital requirements assume some "average" level of correlation within one licensed entity. In case several such entities form part of an insurance group, any additional diversifications (e.g. geographic diversification) are ignored.

written by banks, yet the capital needed to support the business is radically different depending on which environment is chosen. For a bank, the same capital has to be held to support a guarantee as would have to be held to support a loan of the maximum amount guaranteed. In an insurance context, we look at an actuarial assessment of the amount likely to be paid out. What we can be sure of is that, unlike in the case of banks, the amount reserved will almost always be less than the worst case.

These examples illustrate how differences in the current regulatory framework for banking and insurance can lead to different capital re-

quirements. In order to bridge the gap between banking and insurance, additional efforts will have to be made. We describe this in more detail in the next chapter.

6. ECONOMIC CAPITAL, COOPERATION BETWEEN REGULATORS AND THE NEW ROLE OF THE ACTUARIAL PROFESSION

As noted earlier in this paper, there is a trend toward more risk-based measures and many major financial conglomerates are already adapting economic capital as the consistent measure of risk within the institution. Designed as a management tool, economic capital, in our view, more closely reflects the real risks of the business in terms of asset/liability management. Although developed on the banking side, economic capital has more recently been extended to insurance activities.

The reorganization of the supervisors is another development that could help fill the gap. Further consolidation of financial entities made policymakers realize that more coordination of regulation and supervision was necessary.

In addition to this, the actuarial profession must also be transformed in order to meet the new needs. As Bob Partridge, a managing director in Standard & Poor's New York office, states, "Everyone's paying much more attention to accounting and corporate governance issues these days, but the forgotten issue is the actuaries." Traditionally, actuaries focused on technical insurance risks such as mortality, disability, P&C claims risks, etc. Actuaries, who focus on adequacy of reserves, should also be involved in the whole risk taxonomy and the portfolio management of assets and liabilities. This implies that an integration of ALM and the actuarial department is a necessity. Of course this has consequences for the academic actuarial curriculum—transition to a curriculum of all-round financial risk manager, which implies the integration of actuarial science, mathematical finance, econometrics of financial markets, etc.

7. CONCLUSION

There is a need for a more rational and adequate framework for responding in an appropriate manner to the issues and opportunities raised by the convergence of the banking and insurance mod-

els. Within this framework, the actuary will play a crucial role together with other risk managers.

It is only in this spirit of cooperation and mutual willingness to learn from each other that we will reap the full benefits of convergence. Both Basel II and Solvency II are important steps towards that objective—the uniform economic solvency framework. There are many issues still to be resolved. To solve these, we believe that there is a need for a well-structured international platform allowing for an open dialogue between the industry (banking and insurance) and the regulator (e.g., joint forum).

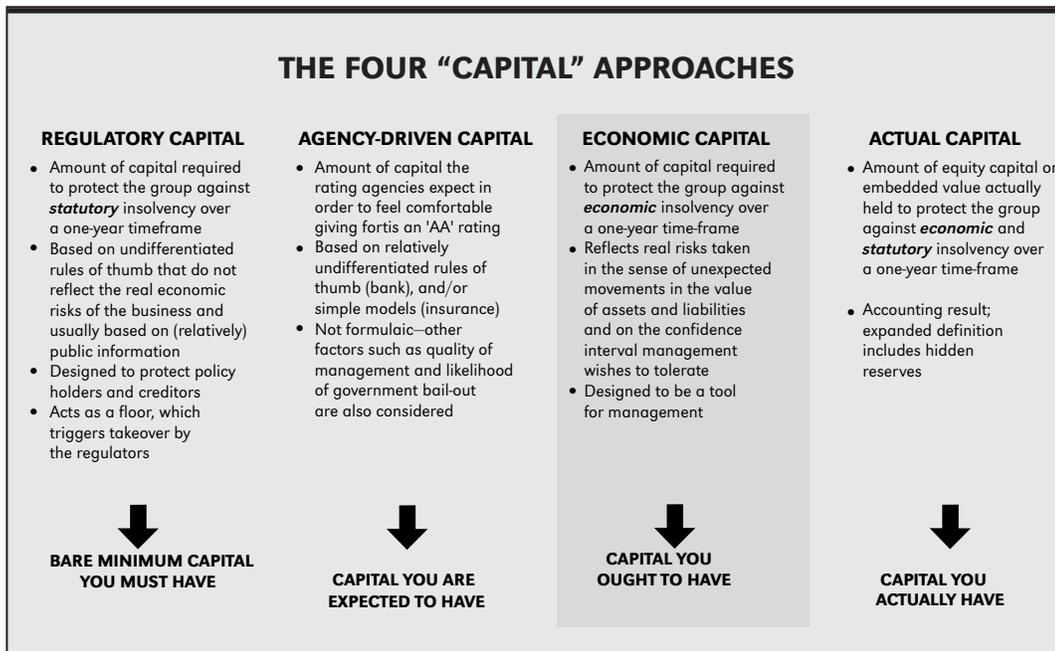
It is also important that regulators and rating agencies encourage and support banking and insurance companies to measure solvency requirements based on economic capital (no fixed rules of thumb).

8. APPENDIX

See chart on right.

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Risk Management Sessions at the 2004 SOA Spring Meetings

By Hubert Mueller

The 2004 SOA Spring Meetings will be held May 18–21 in Anaheim, Calif. (Health and Pensions), and June 14 to 15 in San Antonio, Texas (Life). The following sessions will be sponsored by the Risk Management Section:

I. Anaheim Health/Pensions Meeting (May 18 – 21, 2004)

Risk Management For Health Insurance

Date: May 19, 2004, 2:00 – 3:30 PM

Moderator: Tom Corcoran

Panel: To be determined

Compared to life insurers, health insurers appear to have had less external focus and scrutiny on the appropriateness of their risk management practices and procedures.

Industry panelists will discuss:

- Best practices for risk management of health insurance business
- Challenges companies face in implementing these programs
- Rating agencies' perspective of the health industry's proficiency regarding risk management

The attendees will gain a practical understanding of the current risk-management approaches used, and best practices for risk management of health insurance business.

This session will be co-sponsored with the Health Section.

II. San Antonio Life Meeting (June 14 – 15, 2004)

Chief Risk Officer (CRO) Forum

Date: June 14, 2004, 2:00 – 3:30 PM

Moderator: David Ingram

Panel: To be determined

A panel of CROs discusses their roles, responsibilities and challenges in implementing and managing risk within an insurance enterprise. Topics related to the measurement and management of risk to be covered are:

- Organization of the risk management function
- Key CRO responsibilities
- Measurement infrastructure
- Process of measuring and managing risk
- Risk culture and assimilation of risk into the organization
- Management buy in and support
- Operational risk
- Credit risk
- Risk aggregation
- The role of risk (economic) capital
- Committee of Sponsoring Organizations (COSO) enterprise risk management framework

The attendees will receive a practical understanding of the role of chief risk officers and the effectiveness of companies' risk management programs.



Hubert Mueller (Hubert.Mueller@tillinghast.com) is a principal with Tillinghast - Towers Perrin in their Hartford, Conn. office and the Risk Management Section's program committee representative for the 2004 Spring Meetings. He can be reached at (860) 843-7079.

Hedging Variable Annuity Guarantees: A Practical Discussion

Date: June 14, 2004, 4:00 – 5:30 PM

Moderator: Frank Sabatini

Panel: To be determined

A number of insurance companies have recently implemented or are in the process of implementing variable annuity (VA) hedging programs for guaranteed death and living benefits. The panelists will discuss the benefits of hedging these guarantees, the challenges they face and how they keep score. Challenges addressed include:

- Setting actuarial assumptions such as mortality and lapses
- Anticipating policyholder behavior
- Measuring basis risk
- Determining the methodology and frequency of valuation
- Modeling issues
- Measuring the hedge effectiveness

The attendees will gain insights into the approaches used by companies for hedging the risk from VA guarantees, and the challenges they face in executing these programs.

Making The Case For Economic (Risk) Capital And Risk Adjusted Performance Measurement Frameworks

Date: June 15, 2004, 8:30 – 10:00 AM

Moderator: Hubert Mueller

Panel: Hubert Mueller, Kevin Reimer,
Jose Siberon

A number of insurance companies have recently implemented, or are in the process of implementing, economic (risk) capital. These programs are being implemented because of concerns with the existing regulatory and accounting frameworks and/or companies' desire to have a capital framework consistent with their risk profile. The panelists:

- Discuss implementing economic capital frameworks
- Illustrate through case studies how using an economic (risk) capital framework provides better information for making important decisions on the proper levels of risk exposure and capital allocation
- Show the use of risk adjusted return on capital (RAROC) and other performance measures

Attendee benefits include learning how other companies are using economic capital and risk adjusted performance measurement frameworks and their utility.

Measuring And Pricing For Tail Risk

Date: June 15, 2004, 10:30 AM – 12:00 Noon

Moderator: Hank McMillan

Panel: Hank McMillan, Doug Robbins

Tail risk, long recognized as important to insurance organizations, is being evaluated in a new light, with new approaches. Panelists review various approaches for measuring tail risk, and how to price for tail risk using capital-market consistent techniques.

Attendees gain a practical understanding of the current risk management approaches for measuring and managing tail risk.

In addition, the Risk Management Section will sponsor a hot breakfast, which will be held on June 15, from 7:30 – 8:30 AM. ♦

Conference Update

CAS and SOA to Hold 2nd Joint ERM Symposium in Chicago in April 2004

Building on the success of last year's event, the Casualty Actuarial Society and Society of Actuaries have agreed to again jointly sponsor a professional event focused on enterprise risk management issues.

The 2004 ERM Symposium is scheduled for April 26-27 and will be held at the Renaissance Chicago Hotel in downtown Chicago. This time, Georgia State University's Thomas P. Bowles, Jr. Symposium is a co-sponsor of the symposium and is involved in the program development. In addition, the Professional Risk Management International Association (PRMIA) is participating in the event as a co-sponsor and co-organizer to provide extra content on the nontraditional topics relating to the broader economy ERM issues.

The organizing committee of the first ERM Symposium (July of 2003) has received tremendously enthusiastic support from the participants of that event with requests to continue this joint groundbreaking initiative going forward. Understanding the risk management issues in a broader enterprise context is among the top core skills required for success in the business environment. These skills demand integration of many aspects of business and risk management knowledge and are currently among the most sought after skills in the marketplace.

To explore this broader context further, the second ERM Symposium will build on the success of the first event through the participation of the strategically focused Bowles Symposium and the involvement of PRMIA in the program development.

The symposium is an ideal learning opportunity for those interested in information about emerging risk management trends and practices both within the financial services industries and beyond. In addition, the event will provide a unique networking opportunity to meet individuals practicing in this emerging field in various industries. General and concurrent sessions will provide property/casualty, life and health, as well as broader financial services industry perspectives on various topics.

A complete program is available on the SOA and CAS Web sites.

Chairperson's Corner

▶ continued from page 3

- Monitor and share best practices for risk management
- 4. The Risk Management Section will work to increase the profile of the actuarial profession in the risk management field.
 - Promote the value of ERM and CRO, and the actuary in that role
 - Encourage a focus on risk management for business decision making
- 5. The Risk Management Section will be a key participant in the process of setting standards of practice for risk management.
- 6. The Risk Management Section will encourage appropriate standardization of risk metrics and capital adequacy measures.
- 7. The Risk Management Section will work favorably to influence regulators in the formation of risk management regulations so that they conform to emerging best practices, working with the American Academy of Actuaries.

Underlying this vision of the section's activities is the belief that risk management is a holistic activ-

ity that covers a broad spectrum of risks, including credit, market, operational and insurance/hazard, and that risk management must integrate measurement, monitoring, strategy development, tactical execution and risk preferences.

From this base, we will be working to select some additional projects that the section will undertake. Our starter list has over 40 items. There is no doubt that we will be coming back to you asking for more support and help in one way or another. Anyone who has any suggestions for the section is encouraged to send them to the section council and/or to this newsletter.

My hearty thanks to everyone who has participated in all aspects of this process so far. If you ask me if I think that actuaries will again be recognized as the leading professionals in modeling and management of financial risks, all I can say is that with all this enthusiasm and the high quality of people involved, "You gotta believe!" ♦

Insurer Solvency

▶ continued from page 12

that emerge. It follows that in order for a supervisor to be content with a lower amount of required capital under a company-specific approach, there must be some assurance that the particular source of risk is under control, its effects are well mitigated and there is a reduced need for the required capital. Therefore, in approving a company's use of an advanced or company-specific approach, the supervisor should confirm that the company has in place appropriate risk management processes together with a satisfactory reporting structure.

A particular strength of internal models is their ability to capture the impact of combinations of risks beyond a simple aggregation of individual risk factors that cannot accurately assess risk interaction effects.

Market efficient capital requirements

It is the WP's view that excessive minimum capital requirements, while affording additional solvency protection, will also serve to impede capital investment in insurers because of the perceived additional cost of capital required in the business, beyond that required by economic levels of capital, that may not be recoverable in product pricing. ♦

Comments on the WP report are actively welcomed and can be sent to the author at swason@mow.com.

“There is no doubt about it; we will be coming back to you asking for more support and help in one way or another.”

Articles Needed for Risk Management

Your help and participation is needed and welcomed. All articles will include a byline to give you full credit for your effort. If you would like to submit an article, please contact Shaun Wang, editor, swang@scor.com.

The next issue of the Risk Management Section newsletter will be published:

Publication Date	Submission Deadline
July 2004	May 7, 2004

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 Bryeanne Summers, 847.706.3573, at the Society of Actuaries for help.

Please send an electronic copy of the article to:

Dr. Shaun Wang, FCAS, ASA
 SCOR Group Research Director
 One Pierce Plaza
 Itasca, IL 60143
 phone: (630) 775-7413
 fax: (630) 775-0846
 e-mail: swang@scor.com

Thank you for your help.

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 f 847.706.3599
www.soa.org

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2003-2004 SECTION LEADERSHIP

Editor

Dr. Shaun Wang, FCAS, ASA
 SCOR Group Research Director
 One Pierce Plaza
 Itasca, IL 60143
 phone: (630) 775-7413
 fax: (630) 775-0846
 e-mail: swang@scor.com

Chairperson

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Council Members

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 Ken Seng Tan, ASA
 Shaun Wang, FCAS, ASA

Society Staff Contacts

Clay Baznik, Publications Director
cbaznik@soa.org

Lois Chinnock, Sections Manager
lchinnock@soa.org

Staff Actuary

Valentina Isakina, ASA

Newsletter Design

Mary Pienkowski, Graphic Designer
 Bryeanne Summers, Graphic Designer
bsummers@soa.org

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SOCIETY OF ACTUARIES

**475 N. Martingale Rd., Suite 600
Schaumburg, IL 60173**

847.706.3500 main

847.706.3599 fax

www.soa.org