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Disaster:
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Coral like the Gorgonian Sea Fan shown on our cover are at risk as the result of the Gulf oil spill, although the extent of the damage is not yet known.

Deepwater Horizon Disaster

Insurance Industry Implications

By Stephen Lowe, Joseph Lebens and Michael Pummell

The Deepwater spill will not be a watershed event for the P&C industry. Nevertheless, there are risk management lessons to be learned.

Deepwater Horizon is clearly one of the largest man-made environmental disasters ever, with an estimated 300 million gallons of crude oil spilled over a 10,000-square-mile area of the Gulf of Mexico. More than 800 miles of shoreline in Alabama, Florida, Louisiana, Mississippi and Texas are threatened by the plume of oil. Economic losses from Deepwater will be substantial, and it will take some time before their full extent is known.

However, it is Towers Watson's assessment that the Deepwater Horizon spill will not be a watershed event for the property & casualty insurance industry, relative to the total economic losses from the disaster.

Policyholders with first-party property damage and business interruption losses presumably will file claims with their insurers, who will then seek subrogation recoveries from companies involved with the Deepwater Horizon drilling site operation. We estimate that net losses to the insurance industry will be in the range of \$4 billion to \$6 billion, and that insurers will likely pay a multiple of that estimate in gross claims that will depend on factors such as whether there will be any Gulf Coast hurricanes this season.

There are many risk management lessons to be learned from the Deepwater disaster, as well as implications for public policy. This event will impact the energy industry in the same way that the financial crisis caused the financial services industry and legislators to rethink both internal company risk systems and external regulation. The massive spill has exposed flaws in risk controls that will require investigation, review and reengineering. Systemic risks of this magnitude are not new, and they remain problematic for insurers that can't effectively diversify them. The best strategy for insurers is to limit their involvement with systemic risks through risk controls.

Deepwater has also created an opportunity for insurers because — like the recent Icelandic volcano eruption — it will raise awareness of the need for adequate insurance coverage, particularly for well-constructed protection against business interruption.

Relatively Speaking, How Big Is This Disaster?

It is interesting to note the systemic nature of environmental disasters and the remarkable scale of potential losses that emanate from them. As a man-made environmental disaster, Exxon Valdez pales in comparison to Deepwater. Perhaps the only comparable event is the Chernobyl nuclear radiation leak in 1986, which affected a smaller area, but with greater toxicity and loss of life.

One major difference between Chernobyl and Deepwater is that better television coverage of Deepwater, coupled with the Internet's proliferation of images and information, has made the spill's implications much more apparent to the general public. A second difference is the disparity between the levels of wealth of the two areas affected.

In addition to the loss of the drilling rig and the direct costs of cleaning up the oil spill, economic losses due to Deepwater will include business interruption within the energy industry itself, as well as in the shrimping, fishing and tourism industries. There will be a further multiplier effect as the interruption in business activities ripples across the local economy more broadly, creating a general decline in economic activity. We may see an uptick in business failures and home foreclosures. Given the size of the geographic area affected, the oil spill has the potential to adversely affect the economies of five states. The extent of these losses will ultimately depend on where the oil goes and how successful cleanup activities are.

On a relative basis, however, we project that the net insured losses from this event will be smaller than those from previous disasters, both man-made and natural. The figure below compares this event to the most costly insurance losses since 1970.

Implications for the Insurance Industry

Our assessment is that the Deepwater Horizon disaster will not be a watershed event for the property & casualty insurance industry. Available information suggests that net commercially insured losses will be a small fraction of the total economic loss that is currently estimated at about \$35 billion. Towers Watson's estimate takes into account the following major components:

- Transocean, the owner of the drilling rig, reportedly has a total of \$945 million of insurance coverage on the drilling rig itself (\$560 million of insured property value, plus \$385 million in additional

coverage to pay for various mitigation and recovery efforts). It is our understanding that Transocean also has liability insurance coverage of \$950 million.

- BP, Anadarko Petroleum and Mitsui were in a 65/25/10 joint venture as the operators of the well. Anadarko has disclosed that it believes it has \$163 million of insurance coverage to draw upon, and Mitsui reportedly has pollution liability insurance coverage of \$45 million. Notably, although named as a defendant in more than 300 lawsuits stemming from the incident, BP itself has no commercial liability insurance coverage for the event. The company has a captive insurer, but no outside coverage.
- As the manufacturer of the well's blowout preventer, Cameron International has disclosed that it has liability coverage of \$500 million.
- As the party responsible for cementing the well, Halliburton has disclosed that it has \$600 million of liability insurance coverage.

The most costly insurance losses 1970 – 2009

Insured loss* (US\$ millions, indexed to 2010)	Victims**	Date	Event	Country
73,298	1,836	8/25/2005	Hurricane Katrina; floods, dams burst, damage to oil rigs	U.S., Gulf of Mexico, Bahamas, North Atlantic
25,007	43	8/23/1992	Hurricane Andrew; floods	U.S., Bahamas
23,450	2,982	9/11/2001	Terror attack on WTC, Pentagon and other buildings	U.S.
20,884	61	1/17/1994	Northridge earthquake (M 6.6)	U.S.
20,538	136	9/6/2008	Hurricane Ike; floods, offshore damage	U.S., Caribbean, Gulf of Mexico, et. al.
15,081	124	9/2/2004	Hurricane Ivan; damage to oil rigs	U.S., Caribbean, Barbados, et. al.
14,221	35	10/19/2005	Hurricane Wilma; floods	U.S., Mexico, Jamaica, Haiti, et. al.
11,422	34	9/20/2005	Hurricane Rita; floods, damage to oil rigs	U.S., Gulf of Mexico, Cuba
9,422	24	8/11/2004	Hurricane Charley; floods	U.S., Cuba, Jamaica, et. al.
9,166	51	9/27/1991	Typhoon Mireille	Japan
8,153	71	9/15/1989	Hurricane Hugo	U.S., Puerto Rico, et. al.
7,902	95	1/25/1990	Winter Storm Daria	France, U.K., Belgium Netherlands, et. al.
7,699	110	12/25/1999	Winter Storm Lothar	Switzerland, U.K., France, et. al.
6,498	54	1/18/2007	Winter Storm Kyrill; floods	Germany, U.K., Netherlands, Belgium, et. al.
6,022	22	10/15/1987	1987 European storms	France, U.K., Netherlands, et. al.
6,023	38	8/26/2004	Hurricane Frances	U.S., Bahamas
4,000 – 6,000 (est.)	11	4/20/2010	Deepwater Horizon	U.S., Gulf of Mexico

* Property and business interruption, excluding liability and life insurance losses

** Dead and missing

Sources: Swiss Re sigma catastrophe database and Towers Watson analysis



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While the litigation may take decades to resolve, it is fair to assume that, under any apportionment of the liability, each of these companies will be called upon to pay claims substantially in excess of their insurance limits and will ultimately draw upon the full value of their insurance policies. The total of the coverage limits enumerated above is \$3.2 billion.

It is possible that other corporations involved in some way in the design, delivery, construction or operation of the Deepwater well could be drawn into the liability litigation. In addition, while unsportsmanlike, it is likely that those involved in the cleanup efforts will also be vulnerable to litigation. This has been the case in other large liability situations, such as asbestos, particularly once it became clear that the insurance coverage of the primary players was exhausted, and the plaintiffs were looking for additional pockets to pay the claims.

However, in the case of the Deepwater event, there is less likelihood that a broader set of liability defendants will be identified. Responsibility for this event appears to be more clear-cut, and the pockets of those involved are quite deep.

In addition to the coverages mentioned above, the companies involved presumably have directors and officers liability insurance coverage. Shareholder suits against the directors and officers of some of the companies have already been filed.

Finally, in addition to the workers compensation claims associated with those killed or injured during the explosion, past experience suggests that some of the workers involved in the event or its cleanup will file workers compensation and/or liability claims related to exposure to toxic chemicals involved in these efforts.

Policyholders with first-party property damage and business interruption losses presumably will file claims with their insurers, which will then seek subrogation recoveries from the companies involved. Our projections include the following:

- **We expect that subrogation efforts will be largely successful, given the facts emerging about the event.** The size of the net loss multiple will depend on a number of factors, not least of which is the possibility of Gulf Coast hurricanes this season. If subrogation recoveries are substantial, the industry could have a credit risk exposure to the extent that the companies involved are financially stressed by the volume and size of the claims against them. Also, collection of the recoveries could extend over a considerable time period.
- **Administratively, insurers will need to be able to identify all claims with an oil-spill component in order to effectively recoup their subrogation recoveries.** This may be clear-cut in many instances; however, in some scenarios it may be necessary for insurers to separate the claimed property losses into “oil-induced losses” and “other causes.” For example, in the event of a hurricane, some damage might be caused by wind, some by flooding and some by the presence of oil in the water driven by the hurricane.
- **Insurers will need to coordinate with BP’s \$20 billion fund, set up at the urging of President Obama, so that double-dipping can be avoided.** BP is voluntarily paying claims from the fund for damages arising from the spilled oil. (BP has stated that it is committed to cleaning up the oil and paying all legitimate claims arising from the spill.) The existence of this fund could mitigate some of the subrogation issues for insurers, as policyholders may not file a claim with their insurer if they are satisfactorily reimbursed by BP.
- **We do not expect Deepwater to be sufficiently significant to turn the overall commercial insurance market.** Usually, a major event causes the market to turn, with prices rising in the wake of the red ink. However, the insurance industry has been operating in a soft market for the last six years (commercial insurance prices generally falling for five years and flat during the sixth).

- **Focusing more narrowly, it is likely that Deepwater will be a watershed event in the marine market segment that provides coverage to the offshore energy industry.** We expect that those prices will rise, perhaps substantially, and terms and conditions imposed by underwriters will become more stringent. To a lesser extent, the market for directors and officers liability insurance in the energy sector may also tighten as a result of Deepwater.

The Deepwater disaster reminds us of the key enterprise risk management (ERM) lesson learned from the failure of Enron years ago, namely the need to understand all the risks that are assumed throughout the insurance entity. Understanding and quantifying the enterprise-wide risk portfolio is paramount to effective ERM. In addition to the insured losses from this event, potentially, some (re)insurers' balance sheets will be negatively impacted if their investment portfolios contained fixed-income or equity securities in the companies associated with Deepwater. For example, BP's share price lost 50% of its value in the two months immediately following the disaster.

Public Policy and Risk Management Perspectives

While we do not have an estimate of the total economic loss from the Deepwater Horizon disaster, it is likely to be substantial. In its second quarter financial statement, BP set aside \$32 billion to cover its share of the losses from the event, so a reasonable extrapolation for the total economic loss might be \$35 billion to \$40 billion.

What is perhaps most striking is that the majority of these losses will fall outside of the commercial insurance system. The bulk of the economic losses will be borne either by (a) those who suffer losses directly and are unable to recover from any other party, (b) the corporations involved in the incident that are either bearing their own losses directly or are reimbursing other parties for their losses or (c) federal and state governments, through payments disbursed from their various disaster relief and other aid programs.

The lack of commercial insurance coverage is not, per se, a problem from a public policy standpoint.

“The majority of the Deepwater losses will fall outside of the commercial insurance system.”

There has been a long-term trend toward greater self-insurance by large corporations, as they have recognized their financial capacity to retain risk. In particular, BP has indicated publicly that it chooses not to buy insurance because it believes the company has the financial capacity to retain the risks arising from its business. Of course, BP's average annual pretax income over the last three years has been about \$30 billion, suggesting that it does have substantial capacity — potentially even sufficient capacity to take financial responsibility for events as significant as the Deepwater spill.

However, this capacity is far from uniform across the energy industry. In fact, the incomes of the other five companies involved in Deepwater are only a fraction of BP's. The average annual pretax income for that group ranges from \$1 billion to \$3 billion, indicating that, absent BP, they would not be in a position to take responsibility for the cost of this event.

It is important that the cost of oil spills, up to practical limits, be borne by the energy companies involved, so that the environmental costs can be appropriately allocated and end up in the prices of oil-based products. Companies operating in this business must either have the financial capacity to take direct responsibility for these costs or should be required to purchase that capacity through insurance mechanisms.

Of course, it is of equal or greater importance to prevent these types of disasters and to mitigate them more effectively when they do occur. Prevention efforts will naturally start with internal reviews of existing processes and controls in light of what went wrong. Regulatory oversight also appears to have been ineffective, and we should expect significant changes in regulation.

On the mitigation front, we were pleased by the recent announcement that a consortium of large energy companies is contributing to the creation of a new nonprofit disaster response organization that will have the appropriate materials and know-how at the ready to respond to future events of this type.

“Prevention efforts will naturally start with internal reviews of existing processes and controls in light of what went wrong.”

Towers Watson Definition of Systemic Risk

Risk of material disruption to the economy or negative impact on the welfare of a large group, stemming from either a natural or man-made event, or from activities within a specific market or business sector

Key Characteristics

- **Size:** Events are typically large, such that they affect a broad area; activities are typically widespread, affecting many people.
- **Interconnectedness:** The economic disruption or negative impact is usually propagated because societal, business and ecological systems are interconnected.
- **Remedies:** A contributing factor is often that remedies are difficult to achieve.

Examples of Systemic Risks

- **Events**, including major earthquakes, volcanic eruptions, hurricanes and floods, oil spills, dirty bombs, nuclear accidents, power grid failures, Internet failures
- **Activities**, including gradual pollution, drugs and medical procedures with unanticipated side effects, tainted or unhealthy food supply, exposure to substances not known to be toxic, release of hydrocarbons into the atmosphere, poor lending practices (disruption of the banking system)



Systemic Risk

Much has been made of systemic risk in the aftermath of the financial crisis, and it is worthwhile to recognize that systemic risks exist more broadly, beyond the banking sector. The sidebar at left shows a new, broader definition of systemic risk proposed by Towers Watson for use by other industries.

In a general sense, systemic risks are events and activities that have the potential to adversely affect the economy and welfare of the population on a broad scale. Key attributes of systemic risks are their potential size and degree of interconnectedness with other parts of the economic system.

Systemic risks are not new. They go back at least as far as the Romans, who made the mistake of building their water system using lead pipes, causing widespread lead poisoning. Nor are these risks all man-made, as demonstrated by the San Francisco earthquake and the Mount St. Helens eruption. Systemic risks have the potential to affect many people before their adverse effects are discovered; examples of this include thalidomide, breast implants and asbestos.

The Deepwater disaster is systemic because of the size of the spill and the importance of the Gulf as a natural resource. Like the banking crisis, its economic impact is rippling across different sectors of the economy — in this case, from the energy industry to other Gulf-related industries and on to the general economy.

Systemic risks pose special public policy and risk management problems. They are problematic for insurers, which can't effectively diversify them. Hence, through risk controls, insurers seek to strictly limit their involvement (as was the case with Deepwater). At the same time, as we noted earlier, insurance costs are an important economic signaling device, often serving to internalize and pre-fund what would otherwise be externality paid for after the fact. From a public policy standpoint, we might be better served by an insurance or quasi-insurance system for these types of systemic risks.

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Keeping Pace With Solvency II

Challenges and Opportunities Facing Insurers

By Gerard L'Aimable, Colin Murray and Naren Persad

Scheduled for 2013, Solvency II will introduce a risk-based regulatory framework and other new requirements for insurers across Europe.

With just over two years remaining until Solvency II takes effect across the European Economic Area (EEA), we've seen a steady stream of developments over the last 18 months.

Thus far, the high-level principles in the Solvency II Directive (Level 1) have been approved. The remaining work is to develop and finalize the details of the new framework, including:

- Level 2 implementing measures to be published in 2011 and then ratified
- Level 3 guidance to be drafted and communicated
- Decision on the equivalence of other regulatory regimes outside the EEA
- Quantitative Impact Study 5 (QIS5) exercise to be completed, plus any additional QIS exercises that might be necessary

In this article, we examine some of the challenges and opportunities facing insurers as they prepare for Solvency II implementation.

Quantitative Impact Study 5

A major activity related to Solvency II is QIS5, which is being run by the European Commission with support from the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS). QIS5

is a test of the latest proposals for the base balance sheet and Standard Formula capital calculation.

The Standard Formula is the default for companies in the new regime. It consists of a series of stress tests that are applied to the market-consistent base balance sheet, allowing for diversification and any risk mitigation currently in place.

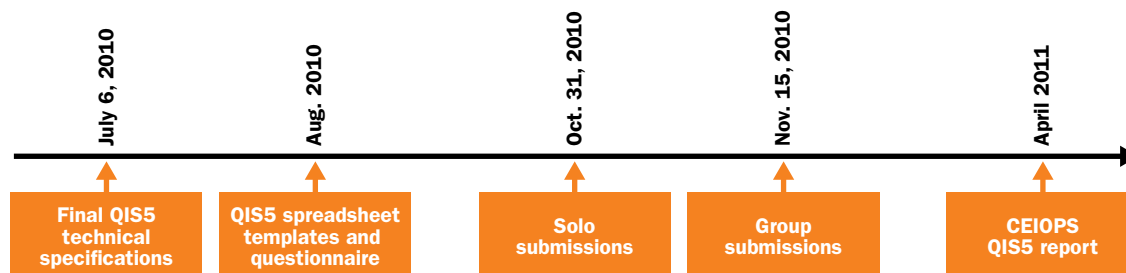
QIS5 objectives include understanding the impact of Solvency II on companies' balance sheets and testing companies' readiness. Several thousand companies are expected to participate, including a significant number of small and medium-sized companies, as well as insurance groups.

QIS5 runs between August and November 2010. The key milestones are shown in *Figure 1*.

Compared with the last impact study, QIS4, the QIS5 calculations are likely to represent a significant strengthening of the requirements. (For more information on QIS5, see "Insights — Solvency II: Getting to grips with QIS5" on www.towerswatson.com.)

“One innovative proposal is to allow companies to use their own internal model for regulatory purposes.”

Figure 1. Key QIS5 milestones





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Internal Model Application and Approval

One of the innovative proposals around Solvency II is to allow companies to use their own internal model for regulatory purposes, subject to meeting specified requirements in areas such as calibration, quality, documentation, data and use in the business. Internal models (and partial internal models, where internal models are used for a subset of risks) represent an alternative to the Standard Formula where tested in QIS5.

Companies have different reasons for wishing to pursue the internal model option. Larger organizations may be under pressure from analysts who expect market-leading risk management, while others could have concerns about whether the Standard Formula adequately reflects the risks in their business. Whatever the reason, the decision to pursue an internal model should not be considered lightly, given the additional requirements and standards expected for supervisory approval.

Some supervisors are already creating processes to facilitate approval in time for the start of Solvency II. For example, in the U.K., approximately 100 companies have indicated their intention to use an internal or partial internal model. As a result, the U.K. supervisor has established a pre-application process with certain criteria that a company must meet before it can be accepted.

To enter the internal model application process, a company must have completed the QIS exercises and have all of the following:

- Credible plans for the overall Solvency II project, with an approved budget from the board
- An appropriate Solvency II project governance structure
- Plans to iteratively improve the internal model
- Supporting documentation for the internal model

To demonstrate board-level engagement, the company CEO should sign off on the application.

Improving Systems and Tools

The new standards underlying Solvency II — for Standard Formula and internal models — will require companies to invest significantly in systems to generate robust numbers the board can stand behind. The group requirement under Solvency II extends to subsidiaries outside Europe, which will also have to perform Solvency II-type calculations.

Property & casualty companies are beginning to realize that the process for deriving technical provisions based on best-estimate cash flows is a fundamental shift from current reserving and will require system changes to allow, for example, discounting of the underlying cash flows.

Similarly, the valuation of options and guarantees will be a challenge for life insurance companies that do not have a tradition of market-consistent reporting. Setting up systems to perform the associated stochastic calculations is complex and usually requires enhancements to existing actuarial models.

Additionally, companies are looking at more sophisticated techniques — such as replicating functions and replicating portfolios — that will provide timely information on the solvency position. Such information allows a company to quickly produce an up-to-date solvency assessment and react proactively to challenges, such as the recent financial crisis, as they emerge. This is necessary if a company is committed to embedding the internal model within the business.

Companies will be using QIS5 as an opportunity to pilot the new calculations with a view toward developing a production version in time for the implementation of Solvency II. An internal deliverable from the QIS exercise should be a management report that describes any shortcomings in processes, systems and available resources, as well as a plan to address them.

Embedding Risk Management in an Organization

All companies under Solvency II will be required to complete an Own Risk and Solvency Assessment (ORSA). For the ORSA, the company must be able to monitor the overall solvency needs of the organization, taking into account the specific risk profile, the approved risk tolerance limits and the business strategy of the undertaking.

The ORSA is expected to engage senior management, as it relies on them to provide the strategic objectives, the risk strategy, and details about the risk appetite and corporate planning. Though board members will delegate many of the tasks, the overall accountability for understanding and endorsing the organization's capital needs over the foreseeable strategic horizon rests with the board.

The ORSA is expected to bring together key components of the risk management system. CEIOPS has defined five core principles, summarized in *Figure 2*, with further guidelines expected in late 2010.

Some companies are already using the ORSA to help promote their internal enterprise risk management (ERM) frameworks. Areas of focus include:

- **Risk appetite.** Developing a coherent risk appetite with a focus on board engagement, the risks the organization is willing to accept, the associated risk limits and tolerances, the key metrics to be monitored and the ways in which the risk appetite will evolve as external conditions change.
- **Risk identification and assessment.** Developing a formal process for the bottom-up identification of risks within the organization and how they should be managed. The work around Solvency II has been helpful in standardizing the categorization for insurance, market and counterparty risks; therefore, much of the focus has been on items such as operational and emerging risks.
- **Risk measurement.** When the risks have been identified, the company must have a robust

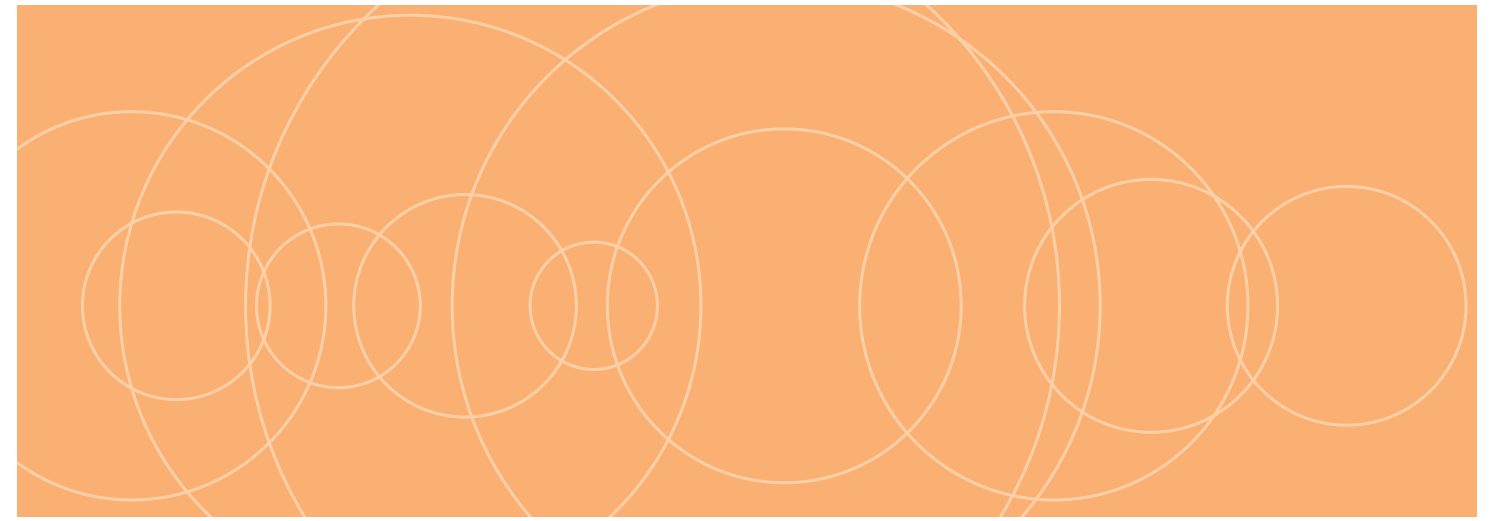
Figure 2. Core principles for the ORSA

Principle 1	Responsibility of the undertaking
Principle 2	Encompass all material risks
Principle 3	Based on adequate measurement and assessment processes, and embedded in the decision making of the organization
Principle 4	Be forward-looking
Principle 5	Appropriately evidenced/documented and independently assessed

method of quantifying them in a timely manner. The work around QIS5 and internal models is helping to promote a market-based economic capital assessment that is the standard under Solvency II.

- **Risk reporting.** To embed a risk management framework, results must be available on a timely basis, and sufficiently flexible and detailed for management to be able to make decisions at either a product or risk level. Increasingly, companies are developing risk dashboards and traffic light indicators to communicate risks more widely and effectively within (and sometimes external to) the organization. At the same time, companies are taking a critical look at their management information. Some of this can be silo-based and a legacy of the past, and can be switched off if it is no longer used to steer the business.
- **Scenario testing.** It is often easier for senior management to engage in scenario development and then work through the implications of the scenarios and potential mitigating actions. Scenario testing can cover plausible events, such as the impact of a mild recession, or tail events, such as the impact of a deep recession, a hyperinflation environment or a natural disaster. These help make risk management real for the board. More recently, companies have been thinking about reverse stress tests that focus on identifying scenarios that could cause the company to fail to meet its stated internal objectives.
- **Link to business strategy.** Risk assessments should be forward-looking. Business plans should include details about the capital implications of different new business strategies, volumes and margins. This links risk management to the

“All companies under Solvency II will be required to complete an Own Risk and Solvency Assessment.”



“Companies need to start developing the necessary infrastructure that will enable them to produce disclosures in a timely fashion.”

capital planning process and highlights whether additional capital sourcing might be necessary. A similar assessment should be undertaken before any major strategic decision is made — for example, a merger or acquisition.

- **Governance and committee structure.** For many companies, the governance and committee structures have not kept pace with developments around risk management. Companies are taking a fresh look at the existing structures with a goal of redesigning their decision-making processes in light of higher-quality, and more detailed and timely, risk information that will become available.
- **Board education.** The board is ultimately responsible for Solvency II, so there is an increasing focus on training board members on their responsibilities under the new regime. This also extends to nonexecutive directors. Solvency II has a legal entity focus, and for insurance groups with multiple legal entities, the work required to bring all of the boards up to date with the requirements should not be underestimated.
- **Documentation.** There are extensive justification and documentation requirements around data, assumptions, methodology, management actions and expert judgment. Such information would be a prerequisite for internal model approval, and companies are dedicating resources to improving and standardizing documentation across the organization.

A risk management culture cannot be created and embedded overnight. It requires a strong commitment from all involved, especially those at the top. Those companies that get the risk culture right will be in the best position to take maximum advantage of the new framework.

Rationalizing Disclosures Under Solvency II

One of the building blocks behind Solvency II is increased private and public disclosure, which will help enforce market discipline on companies.

Private disclosure to the regulator, in the form of the Report to Supervisor (RTS), is extensive. It goes beyond the quantitative requirements to include an assessment of the system of governance, risk profile, and business and performance. This is not without its issues, as companies might have some residual discomfort in sharing their private corporate ambitions (as might be set out in the ORSA) with supervisors.

The planned public disclosure known as the Solvency Financial Condition Report (SFCR) is also extensive. It will add to the already existing disclosures from companies related to EEV, MCEV, IFRS and local GAAP. This poses challenges for companies, as some have expressed concerns about the publication of what is currently considered proprietary information.

From a practical point of view, companies need to start developing the necessary infrastructure that will enable them to produce the disclosures in a timely fashion. This might initially be in the form of a pilot for a subset of the business. In the longer term, Solvency II will add to the year-end reporting cycle, and companies will need to organize themselves efficiently to complete the various requirements on time.

More strategically, the industry needs to determine how companies should communicate with stakeholders in a Solvency II world. Different forms of reporting might serve different purposes, but companies need to be able to explain the differences in a meaningful way or risk losing the confidence of investors.

Project Management and Skilled Resources

At the European level, progress on Solvency II compliance is mixed. Progress is greater in markets where supervisors have been actively engaging with the insurance industry and setting out clear milestones and expectations.

In such markets, many companies have already created a dedicated Solvency II program with a significant commitment of time, money and resources in order to achieve Solvency II compliance. There is, however, a danger that these all-encompassing programs are caught in a planning paralysis. More recently, we have seen companies breaking the program into manageable pieces with a focus on targeted deliverables to be developed iteratively between now and 2013.

Human resources are posing another challenge. Solvency II requires skilled finance, actuarial and risk management employees, and these (especially employees with Solvency II experience) are in short supply. As a result, there is a danger that companies are putting together plans that make unrealistic assumptions about their ability to hire new skilled staff. This problem is likely to be exacerbated over the next two years, as companies, advisors and supervisors compete for the same scarce talent.

In response, companies should be looking to use the employees they already have, via training programs and Solvency II project work. This helps embed the knowledge within the organization, avoids disenfranchising existing staff and provides a more concrete resource base.

A CEO Perspective

Solvency II has wider implications for insurance companies. On balance, they should expect greater regulatory involvement than in the past. This could be in the form of greater supervisory challenge on the assumptions and approaches being adopted; questions on governance and decision-making structures; and *in extremis* capital add-ons if the supervisors believe that the risks are insufficiently measured or managed within the organization.

However, Solvency II also brings opportunities. Some companies see it as a catalyst to invigorate and grow their existing ERM frameworks and an opportunity to gain a competitive advantage. Management has begun to engage on the strategic opportunities that might result from the new framework. For example, a number of groups have cited Solvency II — and, more specifically, the desire to maximize diversification effects — as one of the reasons they are simplifying their corporate structure and reorganizing certain divisions as branches. For these and other strategic decisions, QIS5 provides a useful reference point, as it provides a quantitative framework to assess different strategic options and a basis for an objective cost/benefit evaluation.

Solvency II also has implications for investment and reinsurance strategies. Capital requirements will be driven by the two or three major risks to which a company is exposed. Exercises such as QIS5 enable companies to identify such risks. Management then needs to decide whether to act. If they are uncomfortable with their risk exposure, then a hedging, reinsurance or other risk-reduction strategy will be necessary. It is important to table such issues now, for management to have sufficient time to pursue any risk reduction strategy in advance of Solvency II implementation.

Similarly, companies should be examining the profitability of products under a Solvency II basis. Decisions will be required on whether to adjust pricing or product design — or to exit certain products or markets if they are no longer considered viable.

Ultimately, Solvency II will define how companies in Europe organize themselves and how risk is measured, managed and perceived, both within the organization and externally. Solvency II comes into force at the beginning of 2013, and both insurers and supervisors must address considerable challenges to be ready in time. There is no room for complacency.

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“Some companies see Solvency II as a catalyst to grow their existing ERM frameworks and an opportunity to gain competitive advantage.”

A Demutualization Case Study

Japan's Dai-ichi Life

By Masahiko Fujiki and Kenji Nagashima

We examine Dai-ichi's recent demutualization and the underlying market trends that led to it, as well as key challenges facing the listed life insurance sector in Japan.

Background on Dai-ichi Life

On April 1, 2010, Dai-ichi Life, the third-largest life insurer in Japan, finalized the largest demutualization since demutualization was permitted under insurance business law in 1996. At the time of Dai-ichi's IPO, the company's market capitalization was ¥1.6 trillion (US\$19 billion) and it boasted more than 1.3 million shareholders (believed to be the largest number among all the companies listed on the exchange).

Dai-ichi Life is Japan's third-largest life insurer after government-owned Postal Life and Nippon. Dai-ichi has total assets of ¥30.8 trillion (US\$366 billion) as of March 31, 2010, and premium income of ¥2.8 trillion (US\$33.2 billion) for the 12 months ending March 31, 2010. Its market share is roughly 10% in terms of assets.

Dai-ichi Life was established in 1902 as Japan's first mutual insurance company. It sells a full line of life products, including conventional individual life and annuity business, and group annuity and group

life business, primarily through its direct sales force channel. While the vast majority of its business is in Japan, Dai-ichi has some overseas interests, mainly in other parts of Asia. The company launched its variable annuity specialist subsidiary, Dai-ichi Frontier Life (DFL) in October 2007 and holds a 90% stake. DFL sells variable annuity products mainly through banks.

Reasons for Demutualization

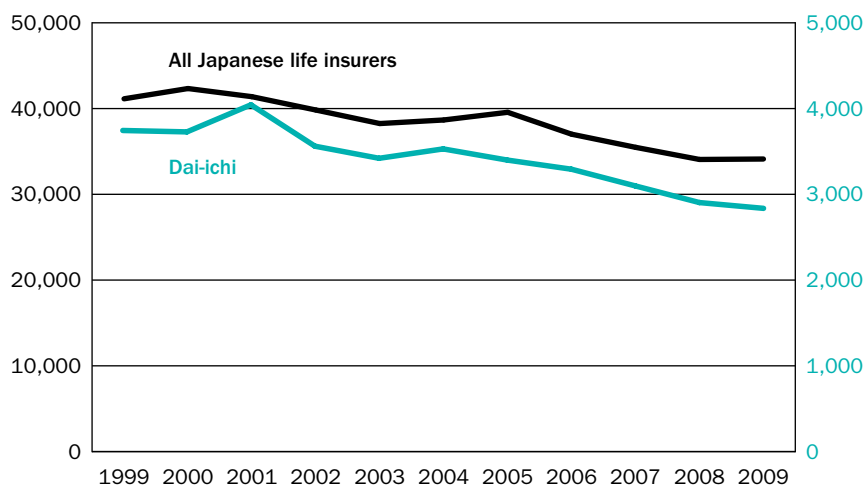
Dai-ichi said in its 2009 annual report:

The Japanese life insurance market is confronting not only emerging structural changes — which include a declining birthrate, an aging population, and changes to social security systems — but also stronger competition and deregulation that are taking place across industries. In this environment, to achieve sustainable growth, we have determined that the Company must demutualize and list its shares, so that it can be more flexible in its operating strategies and achieve greater management transparency based on market discipline.

The Japanese life market is large but mature. As Figure 1 shows, premium income for both Dai-ichi and for all Japanese life insurers combined has gradually declined over the last 10 years. However, because the Japanese life market is so big, it still attracts new entrants. In addition, the market has some growth areas, such as medical and annuity businesses. However, for large players, the overall growth potential in the Japanese life market may not be satisfactory, and many of them are trying to expand into Asia and other parts of the world. Japanese companies started expansion into the Asian life market less than 20 years ago — well behind European and U.S. multinationals — and their expansion has been of limited scope.

“Despite a 10-year decline in premium, the Japanese life market continues to attract new entrants.”

Figure 1. Premium incomes (¥ billions)



Note: Dai-ichi figures are on a stand-alone basis, excluding DFL.

Since 2007, Dai-ichi has been actively expanding into the Asian market and now has an acquisition in Vietnam, and equity stakes in a Thai and an Australian insurer, plus a joint venture with two Indian banks. But Dai-ichi is not alone in seeking to expand and diversify its business base. Other large Japanese insurers are also trying to either expand their business or to restructure themselves.

Nippon Life and Sumitomo Life, both mutuals, have joint ventures or holdings in China, and Nippon Life is trying to expand into general insurance. Another large mutual, Meiji-Yasuda, formed through a merger in 2004, has a life operation in Hawaii but not in Asia. T&D Insurance Group, listed on the Tokyo Stock Exchange, was formed in 2004 by the demutualization and merger of Taiyo and Daido.

In the last 15 years, large Japanese general insurance companies have typically merged with other general insurance companies, started a life assurance business in Japan, expanded their life business (mainly in Asia) or expanded their general insurance business.

Tokio Marine Group, formed by a merger of Tokio Marine and Nichido, has life subsidiaries in Japan, Singapore and Malaysia, holds minority stakes in life companies in Thailand and India, and life Takaful business in the Mideast.

MS&AD Group was formed April 1, 2010, by a merger of Mitsui Sumitomo, Aioi and Nissay Dowa. Ten years ago, this group was actually six different general insurers. MS&AD has three life subsidiaries in Japan, including a joint venture variable annuity specialist insurer with MetLife. The company announced the acquisition of minority stakes in life insurers in China and Malaysia in the first half of 2010.

Another large general insurer, NKSJ Group, was also formed on April 1, by a merger of Sompo Japan and Nipponkoa (which were five separate entities 10 years ago). NKSJ has three life subsidiaries in Japan. Although it has general insurance operations overseas, its overseas life business is very limited at this stage.

Dai-ichi's Demutualization

At demutualization, Dai-ichi issued 10 million shares, and eligible members were allocated shares in proportion to their contribution. Here, eligible policies were defined as participating policies in force on March 31, 2009 (the "record date"). Since Dai-ichi sells few nonparticipating policies, this was almost the same as all in-force policies as of the record date. Eligible policies with zero or negative contribution were not allocated any shares. Dai-ichi did not raise additional capital at the time of its listing.

Contribution analysis

Japanese regulations require that, on demutualization, shares be allocated in accordance with each member's contribution to surplus. Allocation of a fixed number of shares per member/policy is not allowed. Contribution is calculated as the net asset share of each participating policy as of the record date. The net asset share is past cash flow accumulated to date, less a provision for future benefit payouts.

Share allocation

Of the 8.2 million members with eligible policies, 7.4 million, or 90%, were allocated shares. Of those, 3.1 million received one or more shares, and others received less than one share. In previous Japanese demutualizations, the percentage of eligible members who were allocated shares was between 43% and 74% (Figure 2). Under Japan's regulations, which do not allow a fixed allocation, 90% is relatively high and probably helped to reduce dissatisfaction among members.

Figure 2. Demutualization of life insurance companies in Japan

Company	Demutualization date	Number of eligible members (millions)	Percentage of members receiving shares
Dai-ichi	April 1, 2010	8.2	90%
Daido	April 1, 2002	0.9	74%
Taiyo	April 1, 2003	3.8	70%
Mitsui	April 1, 2004	2.6	64%
Yamato*	April 1, 2002	0.1	43%

*Now Prudential Gibraltar Financial Life



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Dates and Process

- March 27, 2008: Dai-ichi's board voted to demutualize and seek public listing.
- December 25, 2008: Dai-ichi's board determined that:
 - The demutualization date would be set for April 1, 2010, subject to necessary approvals.
 - The record date would be March 31, 2009, and the contribution calculated for participating policies in force on the record date.
 - Listing on the Tokyo Stock Exchange would be sought for April 1, 2010, or as soon as possible after that date.
- June 5, 2009: Each eligible policy's contribution was calculated as of the record date, and Dai-ichi's board proposed its demutualization plan and announced that it would be discussed at the annual representatives' meeting.
- June 30, 2009: At the annual representatives' meeting, the demutualization plan was approved. (The representatives' meeting had the ultimate power to decide Dai-ichi's important managerial issues.)
- Third quarter 2009: After the representatives' meeting, all members received details of the demutualization plan, including the "Plan for Demutualization" document and the number of shares they had been allocated, and were invited to comment by December 28, 2009. Only 120 members objected to the plan, and it was approved.
- February 22, 2010: The Tokyo Stock Exchange informed Dai-ichi that it would be listed beginning April 1, 2010, and the board finalized the details of the listing.
- April 1, 2010: Dai-ichi Mutual Life Insurance Company became Dai-ichi Life Insurance Company Limited.

Policyholders' rights

On demutualization, all the rights/interests of all Dai-ichi members were extinguished, although they retained their interests as policyholders. There are no regulatory minimums on the percentage of profit attributable to policyholder dividends for proprietary companies, although mutuals need to distribute 20% or more of the profit. Dai-ichi stated in its Plan for Demutualization that, so as not to impair policyholders' reasonable expectations for future policyholder dividends:

- A participating policies account would be established to segregate profits/losses of participating policies from those of nonparticipating and noninsurance businesses.
- 20% or more of the profit of the participating policies' account would be distributed as policyholder dividends. The minimum percentage may change in line with any changes to the statutory minimum for mutuals.

IPO

The offer price was ¥140,000 per share. Fractional shares were sold by Dai-ichi and cash was paid to the relevant shareholders. Full shares could be retained or sold together with fractional shares. Actual shares offered at IPO were 7.1 million shares out of 10 million issued. Fractional shares and full shares sold at IPO received ¥135,685 per share after deducting costs from the offer price.

Many members who were allocated full shares chose to sell. Nevertheless, Dai-ichi's demutualization created 1.37 million new shareholders as of April 16, 2010, believed to be the largest among the companies listed on the Tokyo Stock Exchange and exceeding NTT's 1.0 million.

The opening price on the day of listing was ¥160,000 per share (market capitalization of ¥1.6 trillion), 14% above the offer price, but well below Dai-ichi's published embedded value.

Prior to the IPO, Dai-ichi announced its intention to pay shareholders a dividend of ¥1,000 per share soon after the demutualization and IPO, hoping to facilitate the IPO process. The source of the shareholder dividend corresponds to profits between April 2009 and March 2010, when Dai-ichi was still a mutual.



Key Changes for the Listed Japanese Life Insurance Sector

Embedded value

Dai-ichi started its embedded-value (EV) reporting in 2008 following its announcement of an intention to demutualize. The company first disclosed under a traditional embedded-value (TEV) approach, then switched to a market-consistent European embedded-value (EEV) approach before its demutualization and IPO.

In Japan, EV reporting is widespread, and about 40% of life insurers publish EVs at least annually. While many still report TEVs, two listed companies whose business is predominantly life insurance — T&D Holdings and Sony Financial Holdings — report market-consistent EVs. Dai-ichi followed their lead, publishing market-consistent EEV rather than sticking to TEV.

In its IPO offering document, Dai-ichi included details of its market-consistent EEV as of March 31, 2008 and 2009, and September 30, 2009.

Figure 3 summarizes Dai-ichi's EEV results. The March 31, 2009 results were down more than 50% from the previous year for both adjusted net worth and value of in-force business, reflecting the financial crisis at that time. There has been a gradual recovery since then.

Dai-ichi's EEV is sensitive to risk-free rates (Figure 4), as well as a fall in equity values. Management has been using Japanese government bond rates as its reference (discount) rate, without any liquidity premium adjustments. Japanese government bond rates were at their lowest at long durations on March 31, 2009, as shown in Figure 5, which contributed to the depressed EEV at that time. These strong correlations between EEV and interest rates are commonly seen among Japanese insurers, which typically hold long-term liabilities, including whole life and annuity policies. However, asset durations tend to be shorter. Such mismatching is partly due to the scarcity of long-term bonds in the Japanese market.

Figure 3. Dai-ichi's bottom-up EEV (¥ billions)

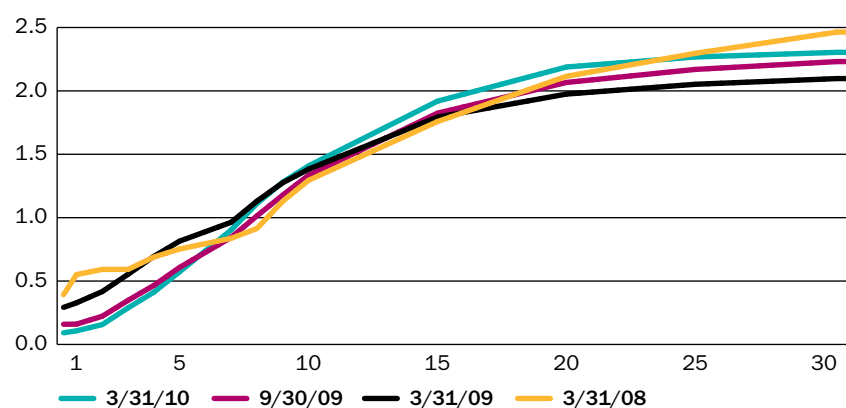
Valuation date	Adjusted net worth	Value of in force	Embedded value	Value of one year's new business
March 31, 2008	2,700.6	948.2	3,648.8	115.3
March 31, 2009	1,296.6	461.8	1,758.4	83.5
September 30, 2009	1,805.2	700.5	2,505.7	33.3*
March 31, 2010	1,863.5	972.8	2,836.3	118.9

*Half-year value of new business

Figure 4. Sensitivity — percent change in values

	Adjusted net worth	Value of in force	Embedded value	Value of one year's new business
Value as at March 31, 2010 (¥ billions)	1,863.5	972.8	2,836.3	118.9
50 bp upward parallel shift in risk-free yield curve	-33%	+99%	+12%	+25%
50 bp downward parallel shift in risk-free yield curve	+31%	-104%	-15%	-29%
10% decline in equity and real estate values	-18%	+1%	-11%	-3%

Figure 5. Risk-free rate of Japanese government bonds



Source: Bloomberg

“In Japan, embedded-value reporting is widespread, and about 40% of life insurers publish embedded values at least annually.”

“Five mutuals are left in Japan... Will any of them demutualize?”

Price/EV ratio

Dai-ichi's opening price of ¥160,000, or market capitalization of ¥1,600 billion, on April 1, 2010, was only 56% of its EEV as of March 31, 2010.

As shown in *Figure 6*, T&D's ratio was about 1.0 until March 2007, but gradually fell to below 60%, while Sony also showed a decline in its ratio to just below 70%. Consequently, Dai-ichi's ratio was in line with those insurers. All three companies showed significant improvement in EV as of March 31, 2010, demonstrating the volatility in the valuations.

In Europe, the price/EV ratio fell well below 1.0 at the end of 2008, but recovered to 1.0, on average, by the end of 2009, while Japanese ratios remained low. Japanese investors could be overreacting to the 2008 crisis, or there may be other reasons, such as a penalty for volatility, an expectation that there will be additional capital raising, or investors' lack of understanding of EV. Explaining large movements in EVs is an important but difficult task that involves disclosure of additional numerical analyses. However, Japanese listed life insurers may need to explain EV in more detail to investors in order to build confidence in the metric and improve the ratio.

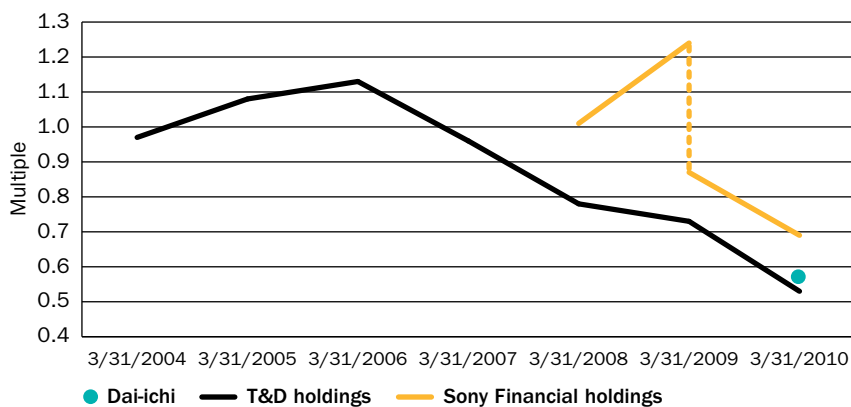
Solvency ratio

The implementation of revised Japanese solvency regulations in March 2012 is another concern of insurers and their investors. The new regulations aim to tighten the capital requirement, and the regulator expects that, on average, the solvency margin ratio for life insurers will fall by 50%.

In Dai-ichi's case, the solvency margin ratio was 953.5% on March 31, 2010. Even if it were halved, it would remain well above the minimum requirement of 200%. Dai-ichi uses a solvency margin ratio of 600% under the current rules as the required capital in calculating its EEV. The new regulations should not change the absolute amount of capital companies aim to hold, unless the new ratio falls below 200%. However, market perception is a concern, and the change in rules could prompt a demand for more capital by market participants.

Such concern might be contributing to the low price/EV ratio. One way to improve the situation might be for insurers to fully implement and disclose economic capital. If they do, investors will have more information, which could lead to greater confidence in insurers' risk and capital management.

Figure 6. Price/EV ratio



Note: Sony restated the value as at March 31, 2009, after adopting new investment and policyholder dividend policies.

More Demutualizations on the Horizon?

Five mutuals are left in Japan: Nippon, Meiji-Yasuda, Sumitomo, Fukoku and Asahi. Together they hold a third of market share in terms of assets. Will any of them demutualize? The answer depends on how they view Dai-ichi's goal to become a multinational life insurer — and how successful Dai-ichi and others are in building their overseas businesses, whether they believe demutualization is effective for that purpose, and the feasibility of alternative approaches, such as staying the course or implementing a new business model that does not involve either demutualization or a merger.

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An Economic Future for Insurance Liabilities

Implications for P&C Insurers

By Bruce D. Fell and Edmund D. Douglas

The advent of economic-value accounting for property & casualty liabilities may mean significant changes in the insurance landscape, from the impact on insurers' financial statements, to the use of reinsurance and its impact on merger and acquisition activity.

Over the past few years, there has been considerable discussion about valuing property & casualty insurance (policy) liabilities on an economic basis. Current accounting paradigms — including most statutory accounting regimes, Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS) — reflect insurance policy liabilities on a nominal basis. While these accounting conventions serve a variety of purposes, they have not required the establishment of insurance liabilities on an economic basis.

In a few regulatory jurisdictions — notably, Canada and Australia — regulators have promulgated accounting for insurance liabilities on an economic basis. However, these jurisdictions have largely used formulaic approaches or factor-based multipliers to convert nominal liabilities to a form that reflects the time value of money and the inherent risk of the liabilities.

Use of economic-based financial reporting is likely to grow in the coming years for several reasons. First, in Europe, Solvency II will require companies to move to economic-based solvency monitoring, and plans for similar requirements are emerging in other countries. There are also plans for the Financial Accounting Standards Board (FASB), which develops U.S. GAAP accounting standards, and the International Accounting Standards Board (IASB), which promulgates IFRS, to develop mutually consistent insurance accounting standards. These new standards will likely include requirements for reflecting insurance liabilities on an economic basis, as recently reflected in the exposure draft issued by the IASB.

While these changes are a few years away, companies should consider the implications for their operations now. For a thorough description and analysis of these accounting changes, see “Insurance Accounting: The Implications” (*Emphasis* 2010/1).

Calculating Economic-Value Liabilities

The objective of economic-value accounting is to provide more transparency to investors and creditors by reflecting loss and expense liabilities at their market value. FASB defines fair value (a term often used to describe economic-based assets and liabilities) as “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.” From a practical standpoint, this means that the liabilities should be stated on a basis that reflects the time value of money, and the risk of uncertainty in the timing and amount of the liabilities.

Since an insurer's underwriting performance drives its overall financial results, it is appropriate to try to better represent the economic reality of the loss and expense liabilities through economic-value reporting.

Unfortunately, establishing the economic value is difficult. The ideal approach would be to simply obtain the value from a liquid market, as one would do with equities or bonds. However, there is no such liquid market for insurer liabilities.

The alternative is to rely on a proxy of market value. One possibility might be to reference the reinsurance market and, in particular, loss portfolio transfer activity. But because these forms of reinsurance are subject to significant limitations and distortions (in addition to their illiquidity), their value in providing appropriate proxy values for economic loss liabilities is severely limited, as outlined in the sidebar on the next page.

“The objective of economic-value accounting is to provide more transparency to investors and creditors by reflecting loss and expense liabilities at their market value.”

Limitations of using loss portfolio transfers as a proxy for market value

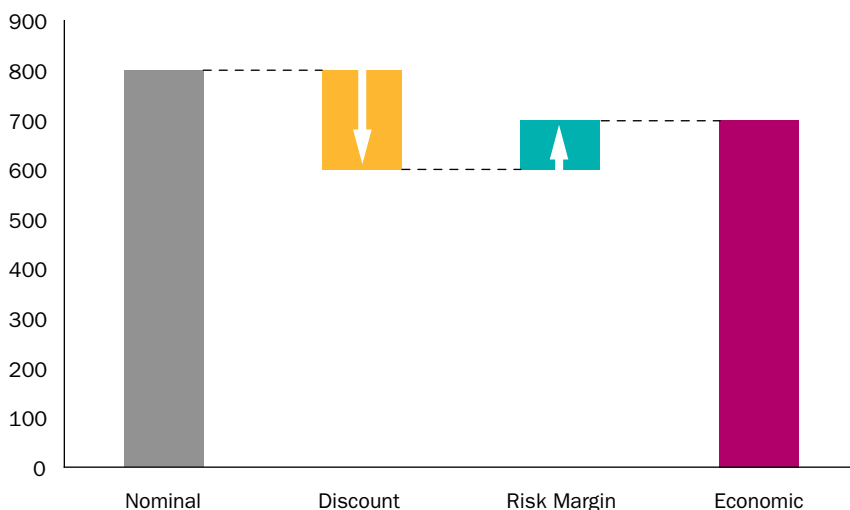
- The existence of aggregate limits removes the risk from the tail end of the distribution, which substantially changes the risk profile and the resulting economic value of the liabilities.
- The differing opinions of the appropriate value of the nominal liabilities between parties means that the price of a specific LPT transaction may be distorted and therefore not reflect the indicated market price for the subject liabilities.
- The structure of the reinsurance transaction, including adjustable premium features, loss sharing, and other terms and conditions, can make it more difficult to assess the risk of the liabilities being transferred.
- Reinsurers may load in an additional margin to compensate for uncertainty regarding the motivation for the reinsurance purchase and information asymmetry, and the contract's desired benefits can result in differing risk margin assumptions between the parties.
- Reinsurers' profit margins may vary depending on the degree of correlation between the subject liabilities and the liabilities already on reinsurers' books.

Absent a liquid market for insurance liabilities or a good proxy market from which to reliably infer their value, insurers are left with the daunting task of calculating the economic value of their liabilities using models and market-consistent assumptions in order to comply with new reporting requirements. Broadly speaking, this calculation requires two steps: reflecting the time value of money and reflecting a margin for risk.

The most widely accepted method in a market-consistent context (and proposed by the CRO Forum in Europe for Solvency II purposes) is the cost-of-capital approach. At a high level, the technique estimates the compensation that a third party would require to generate a desired return on the capital contributed to support the liabilities. *Figures 1 and 2* outline the components of an economic liability for two hypothetical lines of business.

The required amount of capital will differ depending on the risk characteristics (volatility) of the liabilities and the desired level of security (credit risk). By extension, the risk margin will also differ as a result of these attributes. Furthermore, the volatility of the liabilities includes both the uncertainty regarding the *magnitude* of the liabilities and the uncertainty associated with the *timing* of the future loss payments. A variety of factors determine the volatility of the liabilities, including the types and quantity of loss exposures, their geographic distribution, policy limits, attachment points and other factors. The level of security provided (i.e., the probability of default or credit risk associated with the promise to meet obligations to policyholders) also affects the risk margin required. A lower credit risk translates into more capital committed to support unpaid liabilities and, consequently, a higher risk margin.

Figure 1. Line of business A: Components of economic liability



Implications of an Economic World

The implications of this new accounting paradigm would be significant. Most noteworthy:

- Size of the insurance entity
- Diversification benefit of combining differing insurance exposures
- Non-additivity of policy liabilities by line of business
- Sensitivity of assumptions and their impact on insurers' financial statements
- Potential impact on insurance product pricing
- Potential changes to reinsurance structures
- Strategic implications for insurers

Advantage goes to large companies

Insurance relies on the law of large numbers. By combining large numbers of similar, yet independent, exposures to risk, the losses associated with those risk exposures become more predictable and

relatively less risky in aggregate. Therefore, in an economic world where risk margins reflect the inherent risk of an insurance portfolio, the risk margin must be relatively lower for a larger portfolio. Similarly, the capital requirements of a larger entity will also be lower on a relative basis. For example, consider two portfolios of insurance liabilities, one of which is 10 times larger than the other. The larger portfolio's risk margin and capital requirement will be less than 10 times larger as a result of the law of large numbers, giving the larger entity a distinct advantage over the smaller one — and resulting in higher profits, superior returns on capital or more competitively priced insurance products. While this phenomenon occurs today, the financial statements of insurance entities do not explicitly reflect the difference. A movement toward an economic world may result in a trend toward larger insurance companies due to the explicit economies of scale that would be reflected in the financial statements.

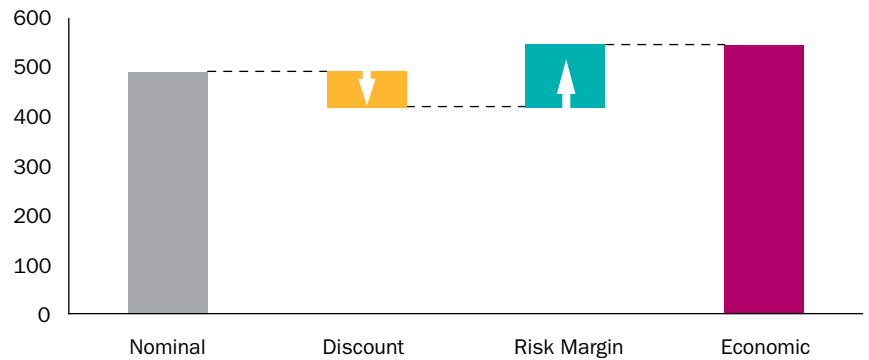
Multiline is better than monoline

Aggregating multiple insurance portfolios with different risk profiles provides explicit benefits to multiline insurance companies. As long as its insurance portfolios are not perfectly positively correlated, the risk margin of a multiline company will be smaller than that of a similar-sized entity that writes one line of business, and can be expected to generate higher profits with less capital. While this dynamic exists today, it is not explicitly reflected in financial statements. The advent of economic-value accounting could result in a trend toward more diverse multiline companies.

Economic liabilities are not additive

Along with this diversification benefit comes a significant challenge: The liabilities for all lines of business combined will need to be reflected on an economic basis. Unfortunately, this is not as simple as summing the economic estimate of each line of business. To aggregate, it will be crucial to have a solid understanding of the correlations between lines of business. Once they have been established, the risk margin for the combined book of business must be determined. The resulting risk margin for the aggregate book will reflect the diversification benefit that results from the partial independence

Figure 2. Line of business B: Components of economic liability

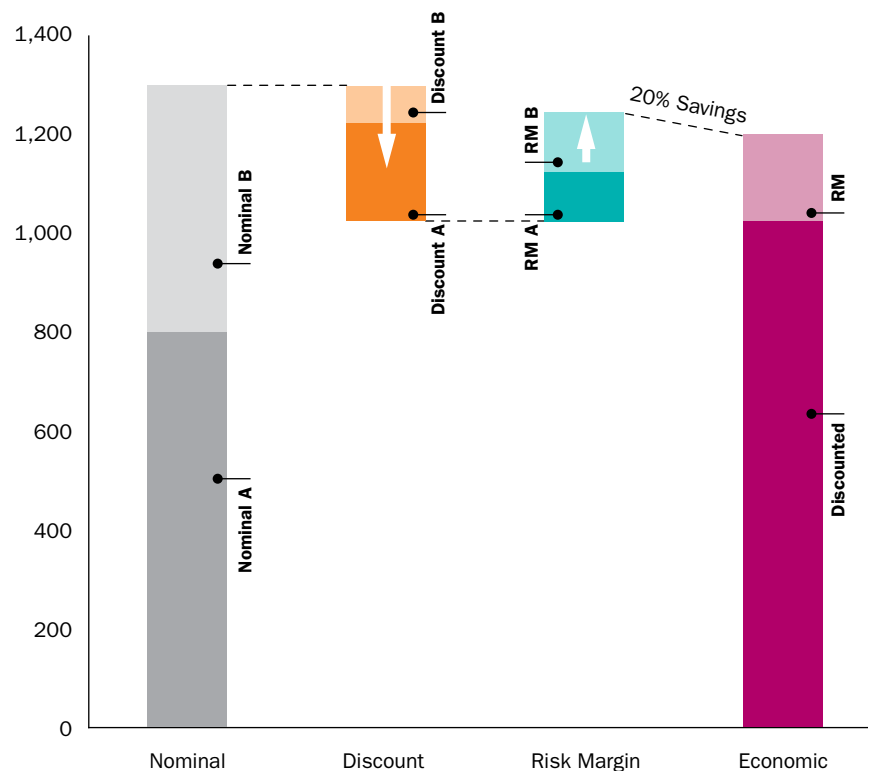


between lines of business. This same lack of additivity will exist between gross, ceded and net results. Interestingly, while transferring risk through reinsurance can reduce volatility, it also results in a loss of some of the diversification benefit.

It is unclear how the diversification benefit would be reflected on the balance sheet and whether this diversification benefit should be allocated to each line of business. (Figure 3 illustrates the impact of combining the economic liabilities from Figures 1 and 2.)

“A movement toward an economic world may result in a trend toward larger insurance companies.”

Figure 3. Combined economic liabilities for lines A and B



Estimates are sensitive to assumptions

From the estimation of development patterns to expected underwriting profitability and changes in underlying insurance exposure, expert judgment is an important part of actuarial estimates. With the estimation of economic liabilities, there will be an increased need for actuarial judgment about expected payment patterns, statistical distributions of the loss liabilities, future economic variables, expected industry returns on capital and, potentially, future tax rates.

Economic liabilities will be sensitive to these underlying assumptions. Each assumption itself reflects a certain degree of uncertainty and, depending on the characteristics of the underlying exposure, may have a leveraged effect on the economic estimate. Underwriting risk — reflecting uncertainty in the magnitude and timing of losses — is the biggest contributor to the volatility of the economic estimate. The volatility is a function of a number of variables, including type of exposure, geography and terms of the insurance contract. Interest rates, another key input, expose the economic estimate to further volatility due to their uncertain nature. The longer the duration of the liabilities, the greater the interest rate risk. Finally, economic estimates are also sensitive to desired levels of security protection (creditworthiness to fulfill obligations) and expected returns on capital.

With the combination of these additional assumptions, economic liabilities — representing what would arguably be the most critical item on an insurer's balance sheet — will likely amplify the volatility presented within an insurer's financial statements. If this volatility is measured properly, the switch to new reporting requirements will

increase transparency. Offsetting this is the reliance on assumptions regarding volatility that are more difficult to validate given they involve estimating the probability of extreme events. This may decrease the transparency and usefulness of the financial statements, and drive capital providers to expect higher compensation for taking on these risks. *Figure 4* outlines the sensitivity and correlation of the economic result to various assumptions.

Product pricing

The economic objective of better representing the economic reality of the underwriting business requires more careful consideration of the components that constitute the insurance product. This in turn may lead to enhanced pricing over time. In fact, insurance pricing already tends toward a more economic derivation of cost. Pricing reflects the present value of expected losses, the uncertainty in loss amounts and payment patterns, and the cost of capital needed to support the business. In addition, thanks to significant advances in pricing techniques (e.g., predictive modeling, price optimization), the insurance industry's tools continue to improve. The industry would expect to see continued improvement in the accuracy of product pricing, and a stronger linkage between pricing and balance sheet liabilities given the common economic approach to the quantification of both.

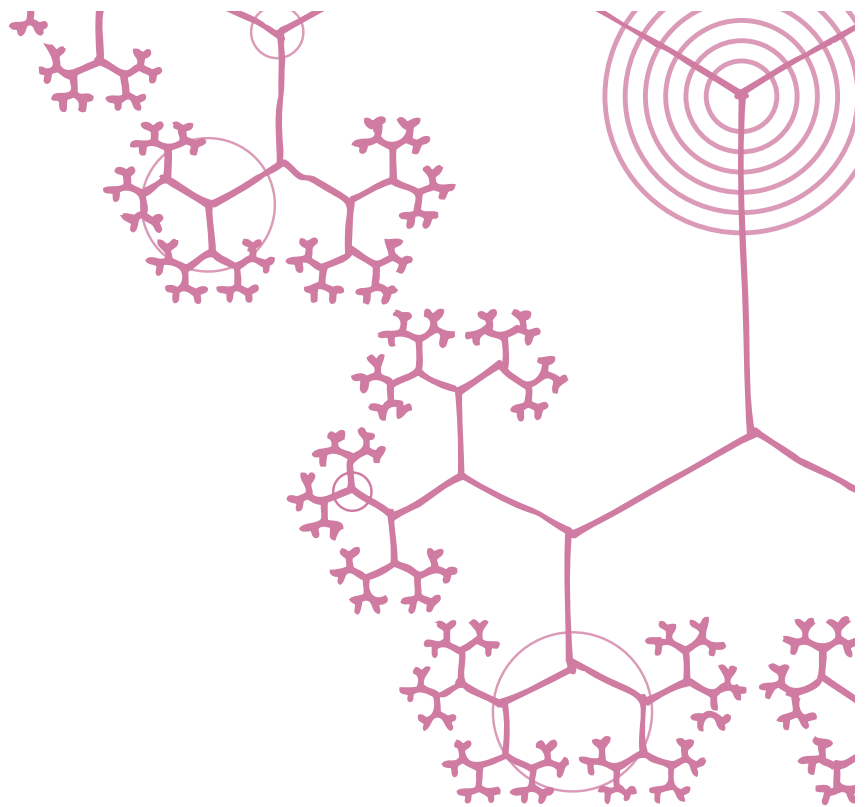
Reinsurance

Reinsurance provides critical support to primary insurers, including capital relief, reduced volatility, increased capacity and catastrophe protection. Often, the impact of reinsurance on financial statements can influence the structure and type of reinsurance contracts as well as their terms and conditions. In an economic world, the use of proportional reinsurance to provide capital relief could be reduced, since an economic view of the policy liabilities would also likely impact how acquisition costs and unearned premium reserves are reflected. The use of retroactive reinsurance may also decline given that accounting benefits from loss portfolio reinsurance contracts will likely be eliminated.

“The industry would expect to see continued improvement in the accuracy of product pricing and stronger linkage between pricing and balance sheet liabilities.”

Figure 4. Sensitivity of assumptions on economic liabilities





Likewise, the use of working-layer (lower-layer) excess-of-loss reinsurance may be reduced when economic liabilities reflect the level of risk contained within these contracts. Companies will more fully recognize that these covers reduce extreme levels of volatility less than higher-layer and catastrophic excess-of-loss contracts. Conversely, an increase in the demand for high-layer excess-of-loss reinsurance and aggregate excess-of-loss reinsurance can be expected, since these contracts will more fully transfer the risk measured in economic liabilities and therefore decrease the required risk margin for retained liabilities. As a result of the accounting changes, the industry will likely find new contract structures and types of reinsurance that can provide the benefits currently generated by reinsurance and the desired accounting benefits within the new accounting conventions. In addition, an increase in mergers will likely result in more large companies that will purchase less reinsurance.

Strategic implications

In an economic world, there are likely to be significant differences in how insurers approach the business. Given the diversification benefits, companies could try to reduce their risk margin requirements by becoming larger and more geographically diverse, and expanding their lines of business. A more diversified underwriting portfolio would mean less volatility and a lower risk margin. The lower risk margin requirement would allow an insurer to be more competitive in terms of product pricing and capital efficiency. Insurers would benefit greatly from economies of scale.

To gain the benefits of size and spread, insurers will need to grow. The most expedient growth options are mergers and acquisitions. Acquisitions of smaller insurers can provide diversification benefits, as can mergers of equals with differing portfolio exposures. These acquisitions can reduce policy liabilities and result in an increase in capital — and the greater the extent of the diversification, the greater the capital gain. Compared to our current environment, the pace of M&A activity will almost certainly increase as accounting changes put small and/or specialized insurers at a competitive disadvantage and make them ripe for takeover.

Conclusion

It is apparent that a world where insurance liabilities are reflected in financial statements on an economic basis would look quite different from the insurance marketplace we know today. Each company will have to consider its own situation in regard to the changes that are coming and closely examine how the various proposals could impact them. In any event, we can expect significant changes in product pricing, reinsurance buying habits, and mergers and acquisitions to have profound implications for insurers. In addition, the marketplace as a whole will look different and may be viewed differently by capital providers relative to other industries. This could impact the attractiveness of insurance company stocks, and change the identity of the largest and most successful insurers around the globe. Insurers need to start assessing the impact that these changes will have on their companies so that they can position themselves to benefit.

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Loss Reserve Disclosures

Time for Improvement

By François Morin and Stuart Hayes

Opportunities remain for insurers to improve the quality of their disclosures of claim liability estimates and reserve selections. Will regulators and investors view more favorably those insurers that provide more detailed disclosures?

Many insurers understand the value of using regulatory disclosures to explain business decisions to investors, analysts and other stakeholders (“Opportunity in Loss Reserve Disclosures,” *Emphasis* 2007/4). Disclosures such as 10-K filings in the U.S. allow management to explain its thought process in setting reserves based on liability estimates, including a description of calculated ranges or other forms of quantifying variability underlying the estimates.

Recent regulatory changes and developments in technology increase the opportunities for insurers to discuss these complex issues. For example, advances in stochastic reserving techniques and economic capital modeling have increased the prevalence of simulation techniques to quantify the variability around claim liabilities. Solvency II in Europe and the expected development of a revised framework in the U.S. provide additional opportunities for disclosure. Companies that take advantage of these opportunities are likely to benefit in several ways.

Updated State of Disclosures

Documents such as 10-Ks, annual reports, and other statements submitted to regulatory authorities and investors are publicly available and easily accessible online. A survey of these documents reveals a broad range of company disclosure practices in the area of claim liability estimates.

Companies differ in notable areas, including:

- **Regulatory environments.** SEC registrants (primarily public U.S. companies) tend to have more consistent disclosure regarding the methodology of setting loss reserves, as the SEC requires some discussion of these important liabilities in 10-K filings. Non-U.S. companies, including those based in Europe and presumably preparing for Solvency II, tend to be less consistent. Some international companies do not even make reference to their methodology in their public documents. Solvency II will likely lead many European companies to enhance their disclosures.
- **Varied approaches.** Disclosures of the variability inherent in unpaid claim liabilities differ widely. Many SEC registrants do not calculate a range or disclose information about this variability. Others provide in-depth information, such as the ranges of unpaid claim liabilities derived either from stochastic simulations or outcomes under alternative scenarios. Many companies provide some variability information but do not disclose a range of overall potential outcomes, while others mention that they calculate ranges but do not disclose any of the results. This area of disclosure is probably the least consistent among the companies surveyed.
- **Segmentation of reserves.** Most companies provide segmentation of their reserves (e.g., by



line of business, geographic region, operating company), but the level of detail and approach varies.

- **Discussion of methods.** Many companies discuss the methods employed to estimate liabilities; however, there is variation regarding the depth of discussion about method and comments on the likelihood of reliance on one method over another.
- **Rationale behind the selected reserve.** Most companies select the recorded reserve using multiple estimation methods; however, there are differences in the explanations regarding the process of selecting management’s best estimate of the reserves.

To illustrate, we reviewed the December 31, 2009 10-K disclosures on unpaid claim variability for over 40 companies and compared them to a similar review we completed three years earlier (Figure 1). We observed the following points:

- The percentage of companies calculating ranges has increased slightly over the past three years, from 44% to 48%. Regulatory scrutiny and improved technology have likely led to this increase; however, this change is not significant and most companies surveyed continue not to calculate or mention range analysis in their disclosures.
- The percentage of companies that say they do not calculate ranges has remained virtually unchanged over the past three years (from 44% to 43%). Some companies commented that these analyses are not applicable.
- The percentage of companies remaining silent on variability analysis in their disclosures has decreased from 13% to 10% over the last three years.

Companies appear to be slowly providing more detail regarding reserving processes, including calculating and disclosing ranges with more frequency than in the past. Increased regulatory scrutiny, including the influence of Solvency II, will likely accelerate these trends.

Reserve Variability Disclosures

Surveying the disclosures, we observe a great deal of variation in how companies choose to present the results of these quantifications:

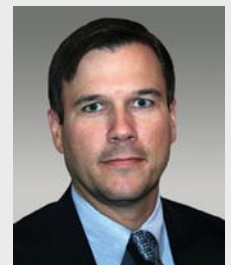
- Of the companies that disclose an overall range of unpaid claim liabilities, the range is usually expressed on the same basis as the presentation of the carried reserves (point estimates). If a company displays recorded reserves by line of

Figure 1. A variety of approaches to range analysis

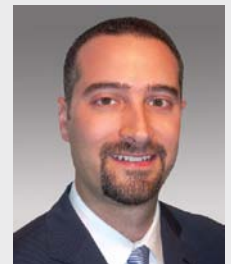


Source: Towers Watson analysis based on public SEC filings

- business, for example, high and low estimates would likely be displayed on this same basis. In some instances, the overall range disclosed is equivalent to adding together the low and high estimates by segment, while other companies explicitly warn against doing this due to correlation concerns. In some cases, companies offer overall ranges that differ from the sum of the parts.
- Some companies disclose what they term to be a range of “point” or “actuarial central” estimates, while others give ranges that attempt to capture the actual variability inherent in the reserves. As we would expect, the width of these latter ranges tends to be greater than a range of point estimates.
- Some companies disclose the results of stochastic simulations of the unpaid claim liabilities at specified percentiles, rather than judgmental “high” and “low” estimates.
- Others do not publish an overall range, but instead provide scenario-specific outcomes based on deterministic changes in assumptions (e.g., development factor increases of X%, severity trend increases/decreases of X%, expected loss-ratio change of X%) or an error in estimating reserves (e.g., X% variance in IBNR estimate). These calculations tend to be applied either to the overall reserves in total or only to certain segments where they would have the most leveraged effect. These disclosures also vary in how the results are displayed: Some companies simply express the effect on the estimates using a standard estimation approach, while others go so far as to calculate the aftertax earnings implications.
- Ranges tend to be expressed without a time frame. Sometimes companies do provide a risk horizon. In the absence of a specified time frame, readers should assume that most ranges are presented in a runoff risk horizon (i.e., ultimate value).



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What's the Difference Between These Two Approaches?

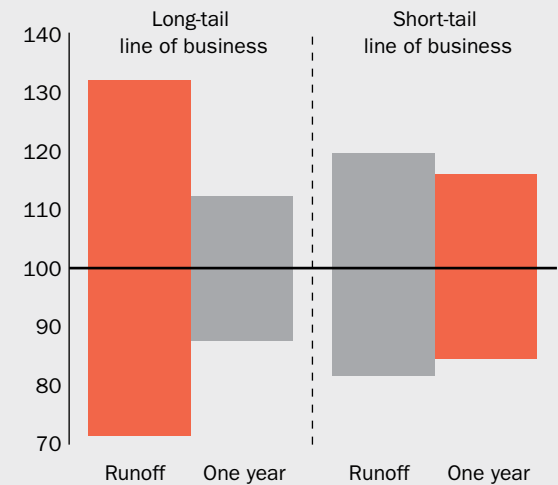
Fundamentally, the two risk horizons are intended to answer two different, but related, questions:

- In the context of a **runoff risk horizon**: What is the potential adverse variation in the ultimate cost of the claim liabilities (net of any offsetting premium or tax benefit) from the current actuarial central estimate?
- In the context of a **one-year risk horizon**: What is the potential adverse change in the actuarial central estimate of ultimate claim costs (net of any offsetting premium or tax benefit) that could occur, with the benefit of one additional year of actual claim emergence and other relevant information?

The one-year risk horizon introduces additional complexity because it requires companies to go beyond estimating the degree to which their estimates are uncertain and also model how the uncertainty resolves over time — in particular, how much of the uncertainty resolves during the upcoming year.

In *Figure 2*, we compare the results from the two approaches for a long- and a short-tail line of business. While the two lines have identical amounts of reserves (on a best-estimate basis), their respective risk profiles produce different distributions of simulated results. In addition, since the uncertainty in each of these lines resolves itself at a different rate over time, the relationship between the runoff distribution and the one-year distribution is different for each of the lines. As expected, most of the uncertainty for the short-tail line is resolved over the next 12 months, while the uncertainty resolves itself over a longer period for the long-tail line.

Figure 2. Risk profile comparison for two lines of business



Note: The black line represents the mean. Each of the bars represent the dispersion around the mean from the 10th percentile to the 90th percentile of a given distribution.

What's My Risk Horizon?

Loss reserve disclosures would be improved with a consistent definition of risk horizon. Historically, companies have tended to produce estimates of the variability on a runoff (or ultimate) basis. Regulations under Solvency II are expected to take a much shorter look, and present all balance sheets and projected capital requirements on a one-year risk horizon.

Given the recent emergence of this second approach, there has been little or no coverage of this topic in the actuarial literature until recently. *Figure 2* describes the difference between the two risk horizons.

The most important benefit to both company management and regulators in presenting ranges of estimates on a one-year basis is that it provides a mechanism to more frequently perform hindsight testing on the carried reserves. Under current SEC reporting rules, companies are required to perform an analysis of loss and loss expense reserve development over a 10-year period. While this

approach tracks the best estimate from a cohort of claims over the 10-year period, it does not provide guidance on whether any favorable or adverse development in the carried reserves was within a range that would have been expected by the company.

By using a statistical approach on a one-year risk horizon, companies will now be able to assess and validate the assumptions underlying their reserve risk model.

Technological Developments

The industry has made great strides recently in its ability to quantify and express the variability inherent in unpaid claim liabilities. We believe there are many contributing factors to this movement in financial reporting:

- Publication of numerous articles on claim variability in actuarial journals has provided guidance and ideas on how to develop ranges for best estimates.

- Improvements in computing power have allowed companies to perform large numbers of simulations with relative ease.
- Many software packages used by actuarial departments are now equipped with a variety of approaches to assist companies in understanding and quantifying the uncertainty of their estimates.

With improvements in technology, many companies have become more comfortable experimenting with some of the new techniques. And while some companies may have been hesitant to calculate and publish ranges of estimates due to accuracy concerns, companies now have access to tools that allow them to more confidently produce these ranges.

Best Practices

As the Solvency II regulations get finalized in time for the 2012 implementation, many companies will be formalizing their approach to calculating the uncertainty of their best estimates over the coming months. It will be important for the selected approach to be consistent with other parts of the company's economic capital model, in particular the pricing/underwriting risk model. The sidebar summarizes best practices for preparing for Solvency II.

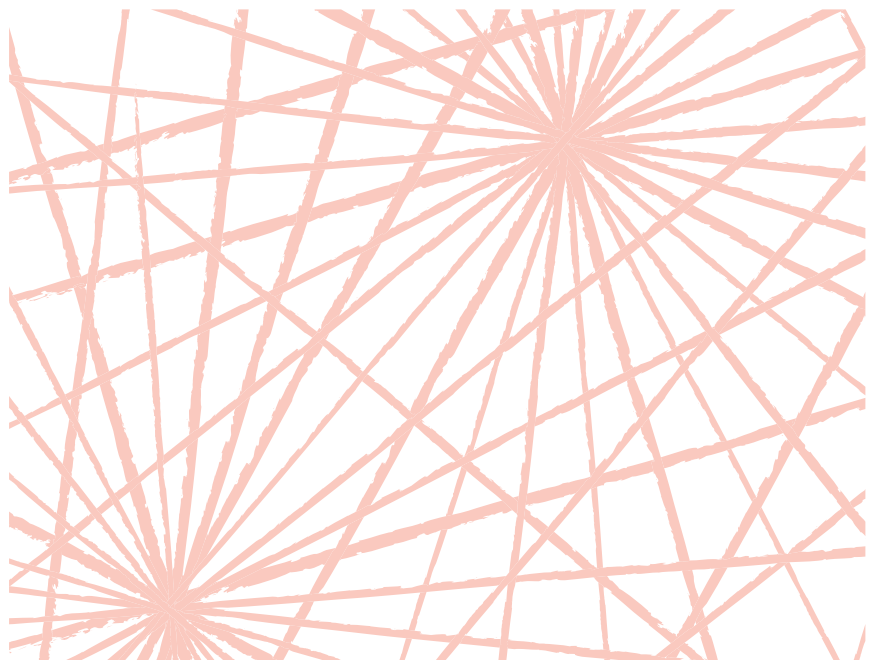
Pillar 3 of Solvency II is concerned with enhancing disclosure requirements in order to increase market transparency. As the framework becomes reality, the onus will be on companies to design the information that, through public disclosure, will be made available to regulators, analysts, rating agencies and shareholders. As a result, we expect that the disclosure of the uncertainty around a company's claim reserves will become a significant part of this new regulatory regime.

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What Are Leading-Edge Companies Doing in Preparation for Solvency II?

Leading-edge companies have spent considerable time developing and refining reserve range calculations over the last few years. In the coming years, we believe the best models will have the following attributes:

- **Integrated reserve risk models and economic capital models.** For some companies, the ranges of unpaid claim liabilities have been developed separately from economic capital models, sometimes resulting in two models being used for relatively similar purposes. It will be important for these models to be reconciled and consolidated in order to produce only one range of estimates for disclosure.
- **Ability to produce ranges on both a one-year risk horizon and a runoff risk horizon.** While the Solvency II framework was developed on a one-year risk horizon, reserve models that can produce ranges on both a one-year and a runoff basis will give management valuable information for managing its overall risk.
- **Integrated reserve risk and premium risk models.** Many companies have developed the underlying reserve risk and pricing risk models of their economic capital models completely independently of each other. Some of the better approaches being used today can reflect the explicit correlation between the two sources of risk. This integrated approach will be superior to separate models, especially as the industry emerges from a soft market environment.
- **Explicit recognition of inflation risk in the model.** Most approaches do not explicitly reflect potential future variations in inflation rates. Reserve risk models that separate inflation risk from residual process risk will provide more actionable information to management. This is particularly true for long-tail lines of business, such as workers compensation, that are exposed to significant inflation risk.



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Study: U.S. Life Insurers to Upgrade ERM Programs. Many life insurers plan to enhance and upgrade essential elements of their ERM function, according to a recent study by Towers Watson and technology service provider CSC conducted by the American Council of Life Insurers.

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Asian Life Insurance Market Update. This comprehensive report includes market growth, penetration indices, market concentration, foreign participation and regional news, plus country breakdowns of current market developments in 12 countries. Annual subscription includes two full reports and two quarterly news flashes. Contact: cisy.yuen@towerswatson.com.

Catastrophe Bonds Evolve to Address Credit Risk Issues. Towers Watson clarifies causes of recent failures of catastrophe bonds to protect investors and describes what can be done to restore market confidence and protect assets going forward.

Chinese Insurance Market. This quarterly newsletter covers industry statistics, market and regulatory updates, distribution and product news. Contact: carol.li@towerswatson.com.

Deepwater Horizon Disaster Not a Watershed Event for P&C Insurance Market. Towers Watson discusses insurance industry implications and estimates net commercial insured losses between \$4 billion and \$6 billion.

India Insurance Market. These quarterly newsletters cover life insurance, non-life insurance and health insurance industry statistics, market trends, regulatory and product news. Contact: qayyum.khan@towerswatson.com.

Insights — The Strategic Dimension (Risk and Financial Services). This publication focuses on understanding and exploiting the sources of competitive advantage in Europe's rapidly changing financial services environment. The current edition highlights key issues for 2010: customer retention, retail distribution, Solvency II and the equity release market.

Life Insurance CFO Survey #26: Trends in the Retirement Income Marketplace. In our second Life Insurance CFO Survey in 2010, we focused on trends in the retirement income product marketplace. In addition to exploring general trends in the retirement income product market, we took an in-depth look at the retail market, the institutional defined contribution market and the institutional defined benefit market.

Variable Annuity Guaranteed Minimum Withdrawal Benefit (GMWB) Features in a Challenging Market. This article provides a broad overview of the pricing methodology used on VA living benefit riders, with particular focus on the GMWB feature.

Property & Casualty Claim Officer Survey #5: Claim Management Operational Perspectives. The fifth Towers Watson survey of property & casualty insurance company claim officers explores how claim operations fit within the corporate structure. We also examine current claim operations and staffing practices.

The Window of Opportunity. We examine several proposed or enacted state policy decisions designed to reshape Florida's insurance market and strike a balance between the general price, availability and quality of property insurance.

India Bancassurance Benchmarking Survey

2009–10. Chronicles the growth of bancassurance in India, the issues commonly faced, key challenges and opportunities and potential. The report contains extensive commentary and insights on the distribution practices, processes and approaches adopted by bancassurers. It also analyses the product landscape, sales management and operational aspects of life insurance and general insurance companies. The full report is available in hard or soft-copy format. Contact: rcsindia@towerswatson.com, or +91 22 42329900.

Distribution Debrief. A quarterly round-up of distribution news in the insurance industry, covering market developments in the Asian region. Contact: lori.abenir@towerswatson for free subscription.

Software Solutions

HPC (High-Performance Computing). Insurers are using their financial modeling systems on a more frequent basis, and they need answers quickly. HPC splits large financial projections into smaller jobs and runs them in parallel across a compute cluster to get much faster results.

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CATography. Master the art and science of catastrophe risk management with our next-generation suite of mapping tools that includes three applications: risk management, underwriting and claims. Contact: John DeMartini at +1 203 363 1960 or David Langdon at +1 860 843 7006.

CLIPS (Commercial Lines Insurance Pricing Survey). This quarterly survey tracks pricing trends across regions, lines of business and account sizes. CLIPS participants represent a cross section of U.S. property & casualty insurers across the top 10 commercial lines companies and top 25 insurance groups. Contact: Jacob Roe at +1 248 936 7473.

eValue. By guiding decisions regarding investment, pension or mortgage solutions, this financial planning tool improves the way advice is delivered by retail financial services companies in the U.K. Contact: evalue@towerswatson.com or +44 20 7170 2240.

HealthMAPS (manuals, analytical tools and product surveys). This health industry resource provides timely and relevant information that over 200 companies rely on as a primary source of rating information or to validate and expand their existing database. Contact: Nicole King at +1 314 719 5860.

\$OURCE (Simulated Operating and Underwriting Results in a Competitive Environment). \$OURCE is an interactive simulation model that illustrates the fundamentals of pricing, underwriting and marketing, enabling improved bottom-line business decisions. Contact: David Mohrman (North America) at +1 860 843 7041, Andrew Gray (United Kingdom) at +44 20 7170 2264, George Maher (United Kingdom) at +44 20 7170 2525, Alessandro Santoni (Italy) at +39 96 3673 6214 or Stephan Westphal (Germany) at +49 221 9212 3463.

Older Age Mortality Study. Our study, the largest of its kind, provides insights that help life insurers price products and portfolios by providing extensive experience data, including gender, smoking and plan category. Contact: David Weinsier at +1 404 365 1781.

VALUE (Variable Annuity and Life User Exchange).

A quarterly subscription database of comparative information on variable annuity and life insurance products, VALUE provides data for making critical decisions about product development, marketing strategies and distribution systems. Contact: Leah Wolf at +1 856 751 1294.

Life Insurance M&A

Time for a Return?

By Steve Taylor-Gooby



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When stock markets reached their low point in March 2009, life insurance M&A transactions almost completely dried up. Initially, several large insurance groups saw the financial crisis as an opportunity to buy undervalued assets from distressed sellers, such as AIG and other companies that had to take state aid. However, when their own share prices hit record lows, it became apparent that no insurer would be able to raise the capital to complete a major purchase. Companies turned their focus instead to conserving cash to strengthen capital ratios.

Toward the end of 2009, stock markets began to recover strongly, although insurance stocks remained depressed. At the end of the year, and moving into 2010, we saw a number of public market transactions. Delta Lloyd listed in the Netherlands; Dai-ichi listed in Japan; a string of companies in Korea launched IPOs, and PZU finally achieved its long-awaited IPO in Poland. However, private transactions remained rare, with MetLife's acquisition of Alico in March 2010 being the only sizable deal.

In the second quarter of 2010, the picture seemed ready to change. Prudential UK seemed on course to acquire AIA when the deal ran into trouble. A mix-up with the U.K. regulator delayed the deal, and in the meantime, stock markets fell sharply. When AIG refused to renegotiate the price, the deal was dead. This failure made further large transactions look even more difficult to achieve.

In June 2010, AXA completed the sale of a large part of its U.K. operation to Resolution, a company with the strategic aim of speeding consolidation in the U.K. life sector. This deal is interesting, particularly because AXA has sold the business at around 80% of its published embedded value. The share prices of both AXA and Resolution rose when trading resumed after the transaction became public.

Major European insurers such as AXA publish embedded values on a market-consistent basis (MCEV). In theory, this represents the value that could be realized if a life insurer sold out of all risk positions and moved to a totally hedged position on its in-force portfolio. The calculation is done on a current market value basis, so it is not clear why an insurer's share price should ever trade significantly below the embedded value. However, at the time of this writing, the major European insurers were trading at about 60% of embedded value.

One reason could be that new business is losing money, thus eroding the value of the in-force portfolio, but this is not the case for the large companies. Another could be that investors do not believe in the "liquidity premium," a feature wherein companies do not fully mark corporate bonds to market value but instead allow for a higher, theoretical value. A third reason, often quoted, is that investors are confused by the many changes insurers have implemented in the calculation of embedded values and the lack of consistency across the industry.

Whatever the reason, depressed prices are a fact, and AXA has made a brave decision to suffer a \$1.7 billion write-down in its embedded value to release capital that can be redeployed in faster-growing markets. The decision seems to have been well received. Could it be the first of several similar transactions?

For comments or questions, call or e-mail Steve Taylor-Gooby at +44 20 7170 2451, steve.taylor-gooby@towerwatson.com.



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