NEWSLETTER
INSURANCE AND FINANCE

THE GENEVA ASSOCIATION

No. 14, August 2014

Editorial

Insurers' Strength and Relevancy in Light of Regulatory, Technological and Coverage Challenges 1
By Etti Baranoff

Feature Insurer
The Geneva Association Interview with David Long, CEO, Liberty Mutual Insurance Company 3
By Etti Baranoff

Remaining Relevant and Contributing to a More Inclusive Society Going Forward (Insurance for the Greater Good) 7
By Katsuo Matsushita and Kunihisa Kawasaki

The Orderly Resolution of Lumbermens 8
By John K. Conway, James W. Schacht and Kenneth R. Wylie

Remarks by Connecticut Insurance Commissioner Thomas B. Leonardi at The Geneva Association's Regulation and Supervision Seminar 11

LIMRA Study Shows Life Combination Products in Double-Digit Growth Pattern 13
By Catherine Ho

Insurability of Cyber Risk 16
By Christian Biener, Martin Eling and Jan Hendrik Wirfs

Cloud Computing: a Fundamental Shift in IT 19
By Farhad Khalilnia

Career Opportunity: Director – Financial Stability Programme 22

Forthcoming Conferences of The Geneva Association 24

EDITORIAL

Insurers' Strength and Relevancy in Light of Regulatory, Technological and Coverage Challenges

By Etti Baranoff[+]

The theme of this Insurance and Finance (IF) newsletter is how the global insurance industry has demonstrated its strength both by providing the coverages needed and by helping to maintain economic growth and stability. The success and the need to remain relevant is in light of regulatory, technological and products challenges which is featured in the various contributions.

In this issue of the IF newsletter, our readers will discover an interview with David Long, the CEO of Liberty Mutual, giving them an opportunity to learn about yet another global player that delivers to its constituencies and helps them manage their risks, thereby maintaining the world's continued prosperity. Liberty Mutual is the IF newsletter's eighth featured insurer and, as all other featured companies, it is an insurer that serves local communities in its global outreach.[1]

With the prevalence of currently strong and successful insurers, Katsuo Matsushita and Kunihisa Kawasaki point out in their article ("Remaining Relevant and Contributing to a More Inclusive Society Going Forward", p. 7) that the global insurance industry should continue to "remain relevant … and contribute to building an inclusive society and economy." While, the feature insurers presenting past and current states, the authors are providing challenges for the future with the call for "many other approaches to keep insurance in the centre ring amid fluid and challenging times. This will be particularly important as governments and central banks look for ways to create and sustain growth in a fair and balanced way." As the reader can see by reviewing the past eight issues of the IF Newsletters with featured insurers, these insurers are

[+] Research Director, Insurance and Finance, The Geneva Association.

[1] In the past seven IF Newsletters, featured insurers included a variety of insurers in terms of product line specialties and geography. All these insurers are successful and most valuable to their communites.

already operating on the cutting edge of innovation and involvement in each community they serve. The sustainability efforts of IAG, the "giving" of Liberty Mutual, are just two examples. One clearly sees that the industry, while decades old, is young at heart and does rise to emerging challenges as highlighted by Matsushita and Kawasaki. The industry uses its resources, both financial and intellectual, to "fulfil a major role going forward."

While we feature insurers' strength, resilience and stability, the global insurance industry is very aware of and immersed in the post-financial crisis of 2008 regulatory challenges. The Insurance and Finance programme of The Geneva Association has published numerous studies regarding systemic risk in insurance and financial stability. This body of work shows that failed insurers do not disturb financial markets and economies. An abundance of studies can be accessed at the Insurance and Finance programme webpage. Among them is the report on resolution of insurers published in 2012 (*Insurance and Resolution in Light of the Systemic Risk Debate*). Currently, the work regarding insolvencies in light of systemic risk and resolution is ongoing. Case studies of the relatively small number of insolvent insurers around the world have been carried out or followed by the Insurance and Finance programme.

The article in this issue "The orderly resolution of Lumbermens" by John K. Conway, James W. Schacht, and Kenneth R. Wylie (p. 8) provides a synopsis of another insolvency case study. This large workers' compensation specialty U.S. insurer underwent voluntary run-off and, in so doing, did not disturb any of its stakeholders. This is a further example that shows not only a lack of contagion effect from insurance failures but also the common availability of substitutions for their products.

The regulatory challenges for the industry are on-going. Few interested in the international regulatory developments for the insurance industry will have missed the ongoing state vs federal discussions in the U.S. It was a subject raised by Connecticut Insurance Commissioner Tom Leonardi at The Geneva Association's Regulation and Supervision Seminar earlier this year. We provide a transcript of his speech that outlines the key challenges facing the implementation of global capital standards in the U.S.

While delving into U.S. regulation, this newsletter sidesteps the regulatory risk issues to discuss the U.S. markets for combination life insurance products. Products development and their sustainability is a major challenge to the industry. In this light, the IF programme produced studies relating to specific products as some of them became the focus of the systemic risk investigation/examination by the International Association of Insurance Supervisors (IAIS). The focus on non-traditional non-insurance (NTNI) products culminated in The Geneva Association research report *Variable Annuities—An Analysis of Financial Stability*. The industry is rich in products and product innovation. The article entitled "LIMRA Study Shows Life Combination Products in Double-Digit Growth Pattern" by Catherine Ho (p. 13) provides an insight into the creativity of insurers in providing responses to consumers' needs. The growth in longevity risk led the industry to develop combination products such as life insurance with long-term care coverage. The industry is continuing to innovate with the changing environment and population age mix. The growth in sales of such products is indicative of the strength and resilience featured by the insurers described in past issues of this newsletter.

In addition, insuring cyber risks—a topic largely discussed in the media—is an area of potential growth and innovation for the industry. In their article "Insurability of Cyber Risk" (p. 16), Christian Biener, Martin Eling and Jan Hendrik Wirfs provide an analysis of the insurability of such risks in terms of pooling and data. With "the G20 group denoted cyber-attacks as a threat to the global economy … considering that expected annual losses from cyber risk are estimated between US$300bn and US$1tn … Insurance is seen as one possibility for managing cyber risk exposure. The market, however, lags behind the expectations for this potentially huge new line of business…." Winners of this year's Shin Research Excellence Award, Biener, Eling and Wirfs conclude that "with increasing market development, the insurance risk pools will become larger and more data will be available."

The final article in this newsletter, "Cloud Computing: a Fundamental Shift in IT" by Farhad Khalilnia (p. 19) discusses innovation of "cloud technology" and its benefits for the insurance industry. The Geneva-based cloud provider describes the technology and compliance support. This kind of innovative IT technology helps insurers remain versatile and agile in this era of mobility and speed in the information arena.

Finally, in closing, the IF programme of The Geneva Association is preparing the 10th Insurance and Finance seminar to be held in London on 4 November 2014. Extremely pertinent issues in insurance and finance will be discussed along with changes in the markets, financial analysis, capital and risk issues, and products.

FEATURE INSURER

The Geneva Association Interview with David Long, CEO, Liberty Mutual Insurance Company

By Etti Baranoff[+]

Liberty Mutual Insurance: a beacon of cultural and financial success

Preface

During my interview with David Long, the atmosphere conveyed to me was of a limber, young insurer like most hi-tech companies, while Liberty Mutual (LM) is over 100 years old. A home-grown CEO, but with a British pedigree, David Long exemplifies the importance of people, whether employees or customers. He said, "We do hold ourselves to a higher standard. We do strive to do the right thing the right way. We do treat one another with dignity and respect, and we do carry that conduct through to our communities and to our customers. This is more than just a 'feel good' thing." Attitude, respect and innovation with an acute perception of what counts the most for a global insurer emerges as the propelling force for action. Following are the questions and responses:

Q: Can you give me a brief overview of the company?

Liberty Mutual Insurance is a property and casualty (P&C) insurer that operates in local markets around the globe helping to preserve and protect the things people earn and own, and build and cherish. We provide broad, useful, competitively priced insurance products and services to meet the ever-changing needs of our customers.

In business since 1912 and headquartered in Boston, MA, Liberty Mutual is the third largest P&C insurer in the U.S. and the fifth largest in the world. Financially speaking, Liberty Mutual has never been stronger.

But financial success isn't the only way we keep score. We also pride ourselves in doing the right thing, the right way. This mindset is indicative of a Liberty Mutual culture that puts integrity above all else.

Q: What are the business guidelines of Liberty Mutual?

We are a company ingrained in an ethic of respect and committed to continuous improvement, innovation and excellence. As most successful insurers do, Liberty Mutual guides its employees to always do what's right for our customers. We view our organisational structure as an upside-down triangle since the employees who sees the customers are key to our success.

We have developed six tenets of behaviour that include integrity, respect, development of talents, innovation, and excellence. Our workforce is very diverse which is important to a U.S. company.

Q: Most Featured Insurers told us about their value to the community. How does Liberty Mutual contribute to improving their communities?

"Social responsibility" is part of our normal course of business activities. Beyond business operations, Liberty Mutual also has a long tradition of giving back to communities all around the world.

In 2013, Liberty and its employees donated nearly $49m to non-governmental organisations throughout the world. Our national employee giving programme, *Give with Liberty*, has reached a very high participation rate of almost 70 per cent with approximately 27,000 Liberty Mutual employees giving about $16.2 million (including the corporate match) to more than 7,000 different charities.

[+] Research Director, Insurance and Finance, The Geneva Association.

We also have a programme *Serve with Liberty.* This is as many global insurers do world-wide.

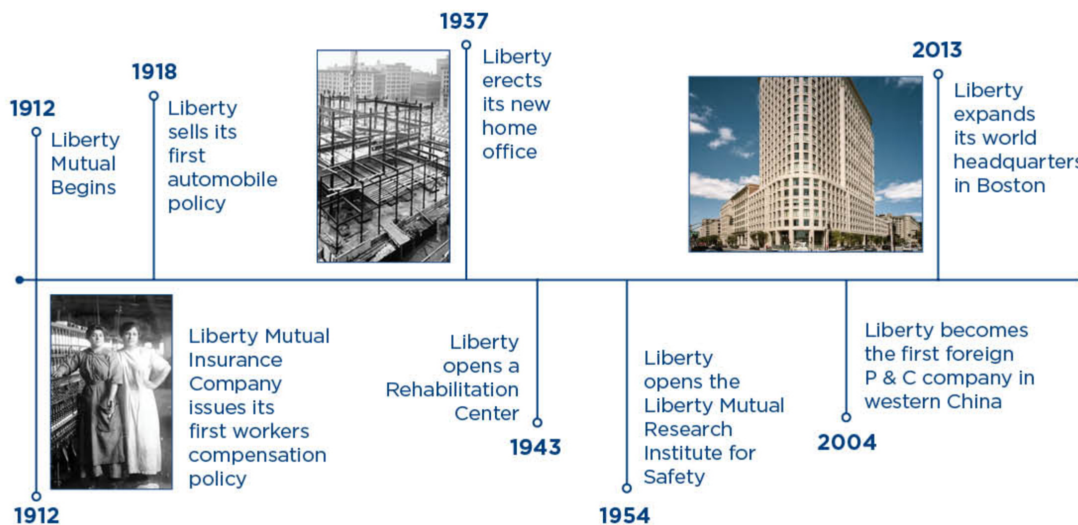
Q: Can you give readers a brief history of Liberty Mutual?

Liberty Mutual was founded in 1912 as a Massachusetts workers compensation insurer after the state legislature, in 1911, enacted one of the first workers compensation laws in the country. From the beginning, Liberty Mutual worked hard to make the world a safer, more secure place. In addition to insurance products and services, our safety breakthroughs, industry firsts, patents and innovative programmes helped reduced workplace injury, illness and disability for millions of men and women.

Over time, we expanded beyond our roots, first throughout the U.S. and then internationally. We also grew our product offerings and, today, have a balanced book of business spread equally across personal and commercial lines.

Today, Liberty Mutual is a diversified global insurer with operations in 30 countries; we employ more than 50,000 people in approximately 900 offices.

Figure 2. Timeline



Q: How is Liberty Mutual different from other companies?

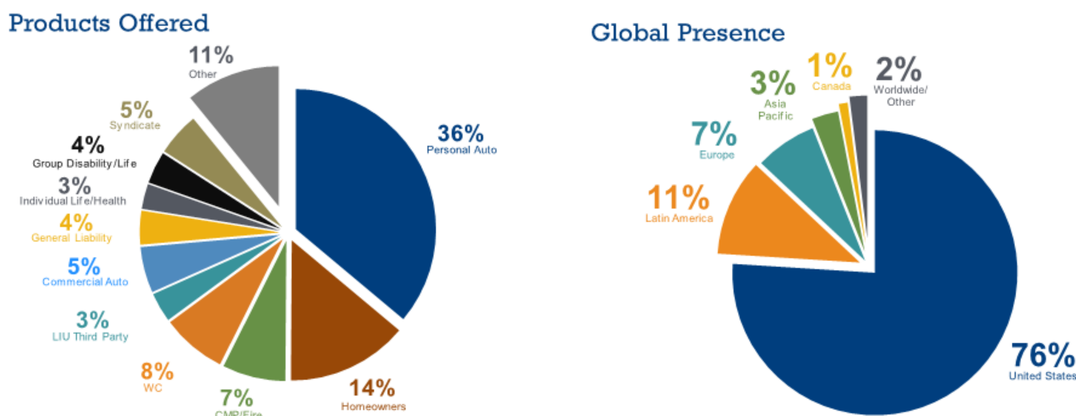
First, our nearly 50-50 balance in personal and commercial business makes us one of the most diversified P&C insurers in the world. Liberty Mutual Personal Insurance sells private passenger automobile, homeowners and other types of P&C insurance products in the U.S. through the Liberty Mutual Insurance and Safeco Insurance brands.

Liberty Mutual Commercial Insurance provides a wide array of P&C and group benefits products and services for businesses of all sizes through independent agents, brokers and benefit consultants across the U.S.

Our Global Specialty strategic business unit brings together Liberty Mutual specialty insurance businesses. Each of these businesses is uniquely capable of bringing new products and services to market quickly, so we can take advantage of demand driven by new and often complex risks. With deep technical expertise and highly productive client relationships worldwide, Global Specialty is poised to expand Liberty Mutual's ability to deliver specialty lines insurance wherever opportunity leads.

Our international business consists of local insurance companies, providing property, casualty, health and life insurance products and services to individuals and businesses in 17 countries.

Figure 3. Distribution of products and geographical presence of Liberty Mutual



Second Liberty Mutual uses multiple distribution channels under the Customer Choice Model. We are an industry leader in "Affinity Marketing", with more than 14,000 affinity group relationships including employers, credit unions, and professional and alumni associations. Customers can access Liberty Mutual via our call centre, website, brokers, or representatives from our network of regional independent agent companies. This multichannel approach means customers can always find the help they need.

Third, our greatest differentiator, I believe, is our people. When Liberty employees were asked about the characteristics that define Liberty, they overwhelmingly spoke of "responsibility" and "integrity". Our character drives our culture, and our culture drives our success.

Q: How is Liberty Mutual staying on the forefront of innovation?

An important hallmark of Liberty Mutual has always been innovation; in fact, this year marks the 60th anniversary of the Liberty Mutual Research Institute which is dedicated to researching the causes of and solutions for accidents that occur at home, on the highway and in the workplace. The company recently celebrated its achievements with the first Liberty Mutual Patent Award ceremony where 67 employees were recognised for developing cutting-edge ideas. And earlier this year, as a way of stimulating new thinking and innovation, we held our first "hackathon", where 130 participants wrote four million lines of code to create 33 applications in 24 hours.

Q: What consumer trends are currently affecting Liberty Mutual and the insurance industry as a whole?

We have adopted the use of mobile technology. Similar to other insurers, with eight billion connected devices in use around the world, we offer a downloadable application for both the iPhone and Android that enables customers to pay their bills, view their policies, and report and track a claim when it's most convenient for them. In addition, we offer a Group Benefits short-term disability/leave application.

Our Home Gallery App allows consumers to take a home inventory of their belongings quickly and easily. To accommodate customers who prefer to interact with us through other social means, we place a heavy emphasis on our Facebook and Twitter presence. In addition, to track what people are saying about Liberty Mutual, we recently launched the Always On room that allows us to monitor trends across all media 24/7. Our Always On room lets us respond as quickly as possible to our customers' ever-evolving needs.

Q: What challenges does Liberty Mutual face in terms of risk management?

We are challenged by many risks as are other companies. Following are specifics:

Catastrophe risk management—One of the most unpredictable challenges for any insurance company is dealing with catastrophes, which are increasing in both frequency and severity. Just in the past few years, we have experienced severe weather events all over the planet, such as Hurricane Sandy, the tsunami in Japan, the Chilean earthquakes and the floods in Thailand. Because of our global presence, it is likely that some part of Liberty Mutual's operations will have a piece of any major loss, wherever it occurs. Managing such risk exposures is important. Most importantly, while major catastrophes cost Liberty Mutual hundreds of millions of dollars, they

also provide us with an opportunity to prove we're different from other companies. We view these events as our chance to deliver quality customer service to our customers who are suffering from devastating setbacks.

Figure 5.

New insurance regulations—Liberty Mutual is an active participant in the current debate over next-generation regulation post the recent worldwide financial crisis. This is despite the fact that traditional insurance activities neither caused nor amplified the crisis. From our perspective, regulation that identifies systemic risk at the national and international levels—and requires enhanced prudential safeguards, including capital standards—makes sense. Much work in this regard is already taking place in the U.S. as part of the Dodd–Frank Act and more broadly, by the Financial Stability Board (FSB) and the International Association of Insurance Supervisors (IAIS). For insurance groups operating multi-jurisdictionally but not designated as posing a systemic risk, the emerging regulatory model appropriately focuses on group-wide risk and includes tools such as supervisory colleges. However, proposals to apply new group-wide capital requirements give us pause, as their need has yet to be demonstrated and they could lead to competitive disequilibrium.

Cyber safety—In today's cyber landscape, data security is more important than ever, and Liberty Mutual is taking all measures possible to protect our customers' data from cyber threats. We are also working to ensure that all our digital channels are seamless to customers in case, for instance, they start a transaction in one channel and then purchase in another.

Interest rates—As we all know, interest rates have a tendency to shift over time. These swings in the global economy naturally have an effect on Liberty Mutual, changing our investment income and profitability for better or worse. But thanks to our sound business practices and financial flexibility, we are fully prepared for any scenario.

Reputational risk—Liberty Mutual is always working to minimise our susceptibility to incidents that might harm our reputation, such as unethical investment practices or not having sufficient infrastructure to handle the massive claims volume resulting from a major catastrophe. We prevent these types of triggers by having a series of strong controls in place, such as accounting practices and oversight, a secure IT infrastructure and a strong management team. Additionally, we ensure that all employees take compliance training and follow our strict code of business ethics.

Talent pipeline—Another challenge for Liberty Mutual is hiring enough talented people to continue our growth trajectory—and, of course, to better serve our customers. The company will likely hire about 35,000 people worldwide in the next five to six years, which represents a massive opportunity for our organisation. We will add only the most qualified candidates in the service and claims fields, as well as great analytical talent, since much of our business is based on risk analysis and understanding how to appropriately price our service offerings.

Q: Finally, as the leaders of one of the largest insurers in the U.S. and globally, how do Liberty Mutual executives manage to sleep well at night—if they do at all?

I can answer that in two words: Liberty people. In addition to being extremely talented, the people who make up Liberty Mutual are individuals with a passion for our business. Because of their commitment, Liberty Mutual will not only persevere through any of the challenges and trends we just discussed, but will continue to thrive for years to come in this highly competitive marketplace. Remember, Liberty Mutual doesn't sell a physical object to our policyholders; we sell a promise that we'll be there when they need us most. And only people can deliver on a promise. That's why we focus so much on talent management—hiring, developing and retaining our people; and on nurturing a work environment where they can thrive and succeed.

Knowing this helps us—and we hope helps our customers—sleep peacefully.

Remaining Relevant and Contributing to a More Inclusive Society Going Forward (Insurance for the Greater Good)

By Katsuo Matsushita[+] and Kunihisa Kawasaki[++]

In order to create and sustain economic and social growth, countries need to come up with solutions to major issues such as climate change, water resources shortage, prosperity sharing, youth unemployment, decreasing opportunities for social engagement, etc. The decline of the middle class (due to structural inequality and less earning power) eats away at social wealth and ultimately poses a risk to democracy. One is reminded how governments proved to be ineffective in the face of major economic crises.[2]

Adding to the equation is the technological innovation and developments that are pushing us into a totally new era. We are seeing a major change in our social infrastructure. We shall soon see smart-grid-based cities and driverless cars become the norm. But it is yet to be seen whether these infrastructure changes will lead to greater good for the public or to more social inequality.

The debate on the interests of a few against many attracts people at the top as well. Bank of England Governor Mark Carney recently argued better financial regulation, despite its short-term creation of market distortion, will in the long run contribute to balancing free-market capitalism with the needs of society.[3] This is something we need to think about.

We as an industry need to raise our awareness of these issues and changes. We need to keep up with the times and changes to remain relevant in an ever-evolving world and contribute to building an inclusive society and economy. The question is how do we do this?

Firstly, there is still much more we can do in terms of tackling underinsurance. Climate change will bring on more frequent and increasingly large natural catastrophes, and we need more public–private partnership-based efforts to provide affordable and sustainable insurance to every person, household and business that needs it. Insurance should be inclusive and lead to solidarity but it also needs to remain fair. Reward those who make an extra effort in regard to risk management and risk prevention. Insurers should also advocate for and invest more in nation-wide disaster prevention and mitigation. In addition to their day-to-day supervisors, insurers need to communicate with and appeal to a wider range of officials, everybody from national infrastructure development ministries to disaster management agencies.

Secondly, insurance needs to be less about just paying out claims and more about helping businesses affected by losses get back on their feet. The payment of claims is a given. What will keep insurance relevant is how it makes the aftermath just a little bit easier for those affected. Businesses should be able to depend on insurers to help them with business continuity and supply chain management. Our recent experience supporting customers cope with and recover from the Thai floods and the Tohoku earthquake was a sobering reminder that such disasters—and more importantly how we respond to them—define us as an industry.

Thirdly, insurers should remain advocates of insurance affordability and sustainability backed by diverse capital. We are seeing an alarming rise in regulatory and compliance costs. Excessive regulatory requirements will become a de facto entry barrier, and higher prudential requirements will lead to consolidation. The market is at risk of becoming stale. We need a healthy turnover (reasonable market entries and exits) to keep our market deep, liquid and innovative.

[+] Liaison Officer for Japan and East Asia, The Geneva Association.

[++] Manager, Corporate Risk Management Dept., Mitsui Sumitomo Insurance Co., Ltd.

[2] Governments had no solid solution so they depended on central banks for monetary stimulus to keep the economy running (while turning a blind eye to its market distortion effects and its fuelling of the next financial bubble). We are all too aware of this as we are now on the receiving end of this fundamentally flawed structure where central banks, the ones responsible for creating distorted market conditions with artificially low interest rates, are threatening to hold insurers accountable should something go wrong.

[3] Speech by Mark Carney at the Conference on Inclusive Capitalism, London, 27 May 2014.

Fourthly, insurance needs to be provided on a level playing field. All capital should be regulated in a consistent manner. Certain capital (e.g. alternative capital making its way into reinsurance) should not benefit from a difference in supervisory approaches based on capital form. Alternative means of coverage need to meet the same requirements as highly regulated capital (traditional capital).

Fifthly, insurers need to think about the bigger picture and act in advance. Prepare for uprising industries and businesses. Insurers should form strategic alliances with developers and operators of smart grids, driverless cars, seawater desalination plants, etc., and work together on getting the data necessary to come up with innovative, effective and sustainable insurance products.

Lastly, insurers need to be long-term capacity-providers and not a fair-weather fan. Being there to provide insurance coverage when a catastrophe is imminent or remaining in the market after a major event is what is expected of us and what will keep us relevant. Raising premiums discretionally or taking away coverage immediately after an event questions the integrity of our business. In order to make this model work, there need to be systems in place. For instance, any profit recognition for major risks with a return period of tens (hundreds) of years needs to be smoothed out across the same period. This is not philosophy; it is simple economics. Accounting standards should allow for pre-event cat reserves. This too allows insurance to contribute to creating an inclusive society. Natural catastrophe-ridden countries (many in Asia) are interested in and seriously considering this approach.

There must be many other approaches to keep insurance in the centre ring amid fluid and challenging times. This will be particularly important as governments and central banks look for ways to create and sustain growth in a fair and balanced way. We too must rise to that challenge and show we have the financial and intellectual recourses to fulfil a major role going forward.

The Orderly Resolution of Lumbermens

By John K. Conway, James W. Schacht and Kenneth R. Wylie[+]

Introduction

This article provides a brief overview of the resolution of Lumbermens Mutual Casualty Company (a U.S. property/casualty insurer) and its insurance subsidiaries and affiliates through a nearly 10-year commercial run-off. In the context of the current debate in the United States and internationally regarding the systemic risk caused by insurer failures, the Lumbermens Mutual Group (LMG) run-off provides an example of how the U.S. insurance regulatory system can handle an insurer wind-down in a way that avoids undue hardship on the insurer's claimants and policyholders. Also, it is an example of an insurer wind-down that does not present a systemic risk to the American insurance and financial services sectors and certainly not the broader American or global economies. The wind-down of Lumbermens did not require any governmental assistance.

Lumbermens was formed in 1912 to handle the risk exposures of the Chicago-area lumberyard industry under the then newly enacted workers compensation laws in the State of Illinois. By 2001, Lumbermens grew to become the sixth largest workers compensation carrier in the United States and one of the largest property/casualty carriers in the country.

Following a series of initiatives in the 1990s to strengthen Lumbermens' balance sheet and diversify its writings within the limitations inherent to a mutual insurance company structure, the company remained capital constrained in the eyes of rating agencies, who downgraded the company to below A- status in late 2002. The company was quickly forced to enter a run-off status, the largest property/casualty run-off in American history.

[+] Respectively, former General Counsel, Lumbermens Mutual Casualty Company; President, The Schacht Group; Senior Counsel, Sidley Austin LLP. The information provided in this article was obtained from public and/or other non-confidential sources. The opinions expressed are those of the authors only and not of any organisations with which they were or are affiliated.

Under the close administrative supervision of the Illinois Department of Insurance (the Department), beginning in early 2003, Lumbermens was able to resolve 90 per cent of its direct and assumed liabilities by mid-2012, resulting in a company group with greatly reduced liabilities and a simplified corporate and contractual structure. At that time, the Department chose to place Lumbermens and certain of its remaining insurance subsidiaries and affiliates into receivership in preparation for the final stage of its wind-down and dissolution.

Run-off

The commercial run-off of LMG was an unprecedented and highly successful endeavour. Over nearly ten years, without any form of governmental intervention or financial assistance, Lumbermens was able to (i) pay over US$10bn in current claim obligations in full as they became due (without any *involuntary* discount or other decrease in claim payments as a result of Lumbermens' financial condition or regulatory status), (ii) monetise over US$9bn in reinsurance recoverables and direct premium receivables, (iii) implement the orderly simplification of its very large and complicated organisational and reinsurance structure, (iv) resolve over US$1 billion in future liabilities to insureds and reinsureds on a purely *voluntary* basis, while (v) maintaining the confidence of the national regulatory community through frequent and in-depth communication, assisted by the leadership and cooperation of the Department.

The Lumbermens run-off is a prime example of how regulators and company personnel can implement the best features of the American insurance regulatory system for the benefit of all constituencies. It also confirms the benefit of early and decisive action by the board of directors of Lumbermens, who decided to accept the inevitability of a run-off solution and to take prudent and responsible steps for the benefit of the company's claimants and policyholders.

The flexibility of a commercial run-off permitted the gradual non-renewal of Lumbermens' in-force business over a 12-month period, placing a consistent, but limited, responsibility on the company's producers to obtain substitute coverage over that extended period. The availability of coverage in the U.S. insurance marketplace permitted most policyholders of Lumbermens to quickly find replacement coverage. While Lumbermens was a substantial player in the U.S. insurance industry, it was not a significant player in the financial services sector and was not interconnected with other insurers, banks or other entities measured by either the size or the nature of such interconnections so as to present a systemic risk to the U.S. (or global) economic system. Most importantly, the very nature of a commercial run-off is to permit the gradual unwinding of significant counter-party risk exposures with direct insureds and reinsureds, with cash payments occurring as would be expected of normal operating companies in the ordinary course. In that way, the actions mitigated the potential stress of unexpected liquidity pressures. This is in sharp contrast to failures that create a "run on the bank" concern voiced by banking and other non-insurance governmental officials in the U.S. and globally. Finally, no taxpayer moneys were used during the wind-down of LMG.

The decision to enter run-off. A rating downgrade at year-end 2002 was quickly met with the decision to enter a run-off. As Lumbermens rapidly changed from an operating company to a full-scale wind-down, its focus shifted from being a profitable *underwriting* company to strictly and solely a *claims-paying* company. As a result of this shift in focus, 2003 became a transition year characterised by a wide variety of transactional initiatives to aggressively shed business lines and expenses.

The execution of the formal run-off plan, beginning in 2004 through mid-2012, was characterised by highly focused attention on liability reduction, through both the ordinary course of claim payments and voluntary disengagement agreements with large insureds, further aggressive expense savings and consistent treatment of counter-parties. The challenges facing LMG occurred in an environment that was not supportive of either a private market rescue solution or pursuit of a traditional state insurance receivership proceeding. A key challenge was the over 200,000 open claim files in early 2003 and the nationwide scope of the business that would have created unnecessary stress to a state insurance receivership proceeding and the 50-state guaranty fund system. The recent failures of almost 30 other writers of workers compensation were straining the operational resources of the U.S. guaranty fund system as then configured. Again, while those challenges in 2003 would not have had a significant adverse impact on the insurance industry (let alone the financial services sector or the U.S. economy), it was determined these challenges could be better addressed through the commercial run-off of LMG.

Advantages of run-off. Consideration of a commercial run-off of LMG under the supervision of the Department avoided an insurance receivership proceeding of LMG that could have had an adverse impact on claimants and policyholders (i) due to delays in the payment of claims, particularly in workers compensation and (ii) elimination of the obligations to provide a claim defence for the benefit of liability policyholders because of the immediate cancellation of ongoing policies. A commercial run-off was a better way to preserve the value of pre-paid claims handling agreements covering workers compensation, general liability and automobile liability, the bulk of the company's claim counts.

A commercial run-off under the supervision of the Department, as the domiciliary regulator for the LMG insurance companies, allowed for the introduction of "economic" financial statements through the use of permitted accounting practices in contrast to the use of statutory accounting principles more suitable for an ongoing company. This flexibility is inherent to the state insurance regulatory mechanism in the U.S. and provides for the ability to tailor a run-off solution to the specific situation presented.

The Department's financial regulators, in contrast to a statutory receiver, were familiar with company operations and financial results, and thus could enhance the transition to ultimate receivership through review and approval of LMG's implementation of transactions involving surplus and liquidity initiatives. Finally, the Department in its capacity as the guardian of the interests of policyholders and claimants—the key constituents in the context of a commercial run-off—was able to protect against the possibility of inconsistent treatment of those policyholders and claimants.

Guiding principles. To enhance the run-off plan, certain guiding principles and initiatives were followed:

1) All valid obligations that met insurance policy provisions and applicable law were timely paid or otherwise settled.
2) LMG's assets, including reinsurance recoverables on both paid and unpaid claims, were managed to maximise the value of those assets, consistent with continued solvency and liquidity.
3) Supervision by the Department included all filings normally required of an operating company with the preparation of financial statements on an "economic basis", while maintaining accounting-based solvency. Additional confidential filings were also specifically designed to assist the Department in its role.
4) Transparency and accountability to policyholders and other creditors were a primary feature of the run-off plan, including regularly scheduled meetings with state insurance regulators and guaranty funds. Disclosures on LMG's publicly available filings were drafted to be both wide and deep, while selective disclosures to private constituencies such as individual claimants were strictly avoided.
5) Retention arrangements were put in place to keep personnel in place to avoid the flight of institutional memory essential to the wind-down.
6) The distribution of assets to the extent appropriate with the run-off plan followed the priorities set forth in Section 205 of the Illinois Insurance Code.
7) A new Illinois Law was enacted to facilitate disengagement transactions (Section 204(m)(C)), which provided that transfers made during the run-off that have been approved by the Department would not be considered a prohibited or voidable transfer in the event the company was later placed into receivership.

Summary

The LMG commercial run-off was a success. In many respects, the run-off was an unprecedented exercise with a high degree of creativity and flexibility in regulatory oversight by the Department in conjunction with focused attention on continued reduction of expenses and policy liabilities by the company. This focus was achieved with the benefit of institutional memory and without the loss of asset and liability opportunities which may have resulted from a premature receivership. The run-off reduced the size of the LMG liabilities by 90 per cent and the number of open claim files by 95 per cent, and greatly eased its eventual transition to the receivership begun by the Department in July 2012. Significantly, the LMG resolution illustrates the lack of systemic risk to the U.S. insurance or financial sectors of a large property and casualty wind-down and the avoidance of any governmental assistance.

Remarks by Connecticut Insurance Commissioner Thomas B. Leonardi at The Geneva Association's Regulation and Supervision Seminar, 24 March 2014, Geneva, Switzerland

The financial crisis highlighted a number of weaknesses in the oversight of our financial system. During the crisis, we witnessed some institutions suffer from a high degree of leverage and insufficient capital, while others suffered from an inability to liquidate assets to settle obligations as quickly as they came due. Some companies suffered from all these symptoms, combined with an unhealthy dose of arrogance. The crisis in turn unleashed a whole host of regulatory initiatives, including: 1) the analysis of the causes of systemic risk and an attempt to identify companies that may pose systemic risk going forward; 2) the recognition that regulators and company management both need to have better tools to assess enterprise risk; 3) the nearly universal use of supervisory colleges to reduce any gaps in supervision; and 4) more recently, the decision to pursue group capital standards for large International Active insurance Groups (IAIGs).

In short, for the past five years, policymakers, regulators, and standard setters have been wrestling with how to ensure that we address the factors that led to the last crisis, without creating a supervisory approach that exacerbates or brings about the next one.

Which brings me to the question of global capital standards for large IAIGs. The feasibility of implementing a global standard broadly depends on its adaptability to the realities in our jurisdictions. For example, a regulatory system that allows a holding company discretion to move capital from a more conservatively regulated area, like insurance, to a more risky area like derivatives trading, may need a different regulatory approach than a system where there are clear legal walls to control such capital flows. In the United States, the authority of the state insurance regulator is a reflection of the decentralized, functional approach to regulation in the US, so any additional authorities or tools we seek to create must fit within this federalist framework, a framework that is a fundamental component of our system of government.

Now some of you may be surprised to hear me say that there are some valid arguments for a group capital standard…these include:

- First, having a uniform measure to assess the relative capital adequacy of IAIGs;
- Secondly, a group capital standard might be useful in assessing the capital adequacy of un-regulated entities, or entities that are not currently subject to capital rules;
- Third, it may provide a view on risk that reflects diversification across the group or, at the other end of the spectrum, that shows concentrations of risk within the group;
- And lastly, it could provide comfort that there is a cushion or buffer within the group to absorb losses.

Notwithstanding these points, as many of you know, I have often questioned the need to move forward aggressively with a Global Capital Standard (GCS) right now, for three key reasons:

- What's the problem we are trying to solve,
- How can you have a GCS without a Global Accounting standard; and
- There are different solvency regimes across the globe, and some are not fully implemented yet.

In addition to these points, we also need to be aware of other the potential pitfalls of group capital assessments: For example, in the US we regulate insurance on a legal entity basis. We expect insurers operating within our borders to meet US Risk Based Capital requirements as well as other solvency tests. If the liabilities are in the US, we expect the assets and capital that support the US business to be here as well. So one needs to be very careful about drawing conclusions from group capital assessments. Assets from US insurers may not be available to absorb losses in non-insurance parts of the group or in other jurisdictions for that matter. In most cases there is no legal obligation of the holding company to move money to a weak affiliate. Perhaps the strongest protection to the financial system and policyholders might well be that each legal entity, including the holding company, holds capital commensurate with its risks. But you can't always tell that from a consolidated group view.

We also need to keep in mind that the larger the size and scope of the group, the more difficult it is to develop meaningful capital standards. Do you develop capital standards for an electronic company? An auto company? A railroad? Or all the other activities that might be undertaken by affiliated entities that are part of a large insurance group?

Notwithstanding all of these questions, my colleagues at the NAIC and I continue to work with the international regulatory community in the hope of achieving an appropriate construct that does not harm companies or consumers, and we have devoted substantial resources to that effort. But we also need to be sure that as we move forward, we do so in a deliberate manner. We need to recognize that these are incredibly ambitious time frames. In fact, when I testified in Congress last month, I suggested that these time frames bordered on reckless. We are attempting to develop, test and implement a Backstop Capital Requirement (BCR) this year, the Higher Loss Absorbency (HLA) next year, and the GCS by year end 2016, and all of this while the Field Testing Task Force (FTTF) for Comframe (which includes testing the BCR, HLA and the GCS) is ongoing. We are not allowing time to take the lessons learned from the FTTF and incorporate those lessons into the BCR before moving headlong into the HLA. We have limited resources in many jurisdictions, and at the IAIS, to achieve this and so many other high priority initiatives.

Beyond the practicalities of implementing a capital standard remain the details of what exactly it includes. My good friend Gabrielle Bernardino delivered an important speech in Brussels a couple of weeks ago, and many on our side of the Atlantic, both from the US industry and regulatory communities, interpreted his words to mean that there must be one single capital standard worldwide, and that Solvency 2 should be that de facto international standard. I can appreciate Gabrielle's point of view and his desire to validate the system he and his colleagues have been diligently seeking to build. But for a global standard to have relevance beyond Europe, it must be implementable in the US and in emerging markets. It should raise the bar and foster compatibility and comparability across jurisdictions, without being unattainable or requiring Equivalence. Indeed, if the global capital standard is just a debate for the largest and most sophisticated markets, what then is the relevance of the IAIS on this issue if only 3 or 4 jurisdictions are capable or willing to meet the standard?

I cannot predict the outcome of the IAIS's work, but application of a global capital standard for insurance in the US, if we decide to go down that path, will require it to wrap cleanly around the legal entity standards that have served our industry and policyholders so well. It must acknowledge the walls that exist to protect policyholders, and the different accounting treatment that exists in the US. I know that many of our international colleagues do not understand or like the state-based system, but it works and has worked for more than 150 years. And yes the Fed will regulate two or three of the largest US-based IAIG's and a handful of insurance groups that own thrifts, but keep in mind that there are over 6000 other insurance companies in the US that will remain the sole province of state regulators. And the Fed, as the consolidated regulator of those few large companies, will still be working very closely with state regulators who are accountable to policyholders in the regulation of the very large domestic insurance legal entities that comprise those large groups.

I know I have said this on many occasions at international events, but many of my colleagues still seem to think that somehow the Federal Insurance Office, or the Fed, or some other federal agency, can make GCS or Comframe the law of the land in the US. They can't. When I met with President Obama in the Oval Office for nearly an hour back in November, he could not have been clearer in his unqualified support for our state based system of regulation. And a number of governors, including my boss, Governor Dan Malloy a Democrat from of CT, and Governor Terry Branstad, a Republican from Iowa, have expressed bilateral support for state regulation. You will likely be hearing vocal support from other Governors in the days ahead as well. This is an issue that both Democrats and Republicans, blue states and red states, are in strong agreement.

The bottom line is that currently, there are only two ways that these international standards can be adopted in the US: One is if Congress effectively repeals McCarron Ferguson, the Federal law, passed nearly 70 years ago, that cedes the authority to regulate insurance to the states. If you view the congressional hearing I referred to previously, you will know that there is no appetite in Congress to do that any time soon…in fact several of the questions from the committee members were focused on their concerns that we not abdicate our regulatory authority or our system that has worked so well for the past 150 years, to international standard setting bodies.

That's not me saying it…that's members of the US Congress saying it. The second way in which international standards can be incorporated into the US insurance regulatory regime (again be it Comframe or GCS) is if a super majority of 42 state insurance regulators vote to support it, and then their state legislatures pass laws to codify it, and subsequently our governors agree to sign those measures. Without that broad level of support, they will not become law in the US, the world's largest insurance market.

So what we do need to do is find a practical and acceptable way to achieve global convergence in the long run, as opposed to pushing forward with suggested changes now that will not be adopted by several jurisdictions that regulate large sectors of the worldwide market. Thank you.

LIMRA Study Shows Life Combination Products in Double-Digit Growth Pattern

By Catherine Ho+

Introduction

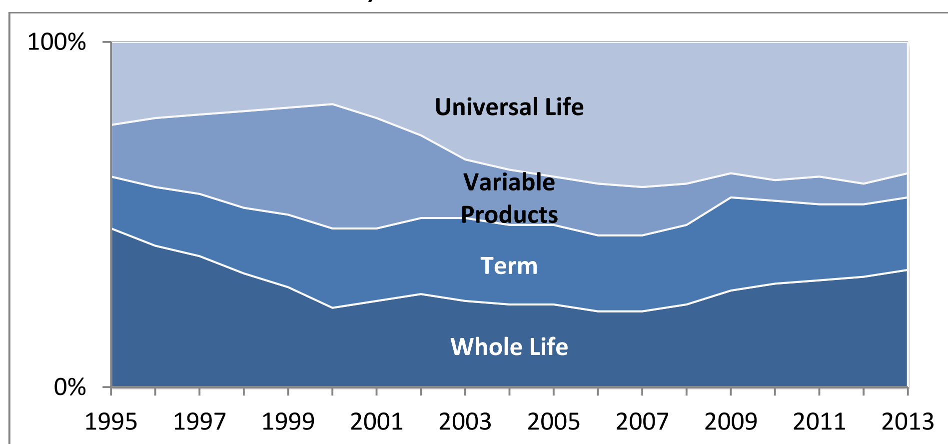
Over the past seven years, LIMRA has been tracking annual sales of life combination products, a subset of the U.S. individual life insurance market. New sales premiums for 2013 marked the fifth consecutive year of double-digit year-over-year growth. Life combination products are defined as life insurance products that pay benefits when the insured meets certain criteria for chronic illness or long-term care. Benefits are also potentially payable to the beneficiary upon death if the insured never meets the chronic illness or long-term care criteria, or did not exhaust all the benefits.

With individual life sales declining in 2008 and 2009 due to the U.S. financial crisis and economic recession, recent double-digit growth in total new premiums for life combination products has made them a hot topic.

History

Life combination products have been available for several decades. A few select carriers offered these products prior to the 1990s, but growth did not happen until more recently. While it is and was a great product at the time, market conditions were not ideal for life combination products. Individual life sales in the late 1990s were dominated by variable universal life (VUL) products, with buyers taking advantage of the aggressive stock market growth. It was a bull market in conjunction with unusually low interest rates, making VUL products much more attractive compared to other life insurance products. Sales drastically declined after the burst of the dot-com bubble. Within three years, sales were half of what they had been at the peak. Both carriers and agents moved away from variable products in favour of universal life products.

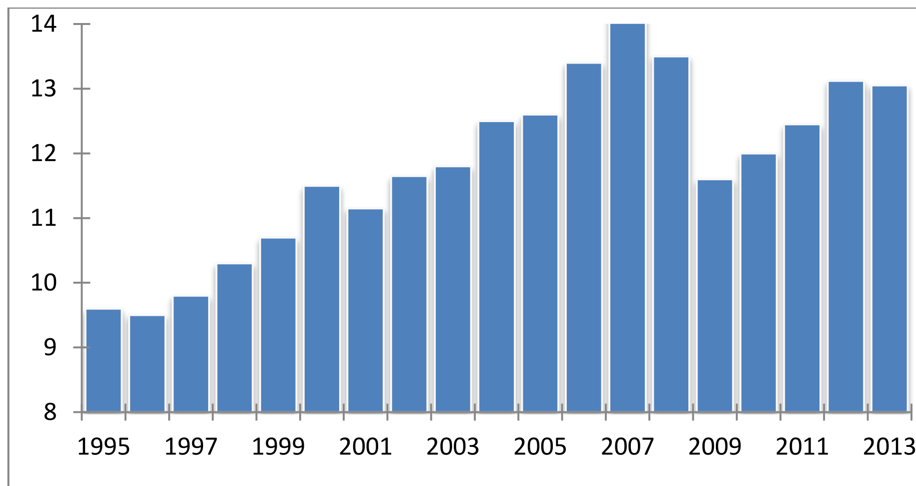
Figure 1. Individual life sales—new annualised premium market share



+ ASA, MAAA, Research Actuary, LIMRA.

Shortly after the fall of VUL, lifetime or secondary guarantee universal life (UL) products gained popularity. With interest rates still low and equity markets stabilised, the pricing of lifetime guarantee UL among carriers became fierce. The low pricing of lifetime guarantee UL, a flourishing U.S. economy, and the uncertain future of estate tax regulations helped pushed life insurance sales to their peak in 2007. During this time period, stand-alone long-term care insurance (LTCI) was also thriving. The Federal Long Term Care Insurance Program was created in the early 2000s. Then, in 2006, the Deficit Reduction Act allowed all 50 states to roll out LTC partnership programmes.

Figure 2. Individual life sales—new annualised premium (US$ billions)



While life combination products grew during this period, they did not keep pace with other products. The turning point occurred during the financial crisis of 2008 to 2009; individual life insurance sales declined in 2008 and then plummeted in 2009 back to what they had been in the early 2000s after the dot-com crash. Consumers became weary of complex financial instruments and opted for simple, straightforward life insurance products.

Long-term care insurance sales also suffered during the financial crisis. The decline of LTCI sales started a few years prior when LTC insurers issued premium rate increases repeatedly over several years. The frequent premium rate increases generated consumer uncertainty towards LTCI carriers. This brought about a market of potential LTCI buyers who were “on the fence” about buying the insurance due to the cost and potential premium rate increases.

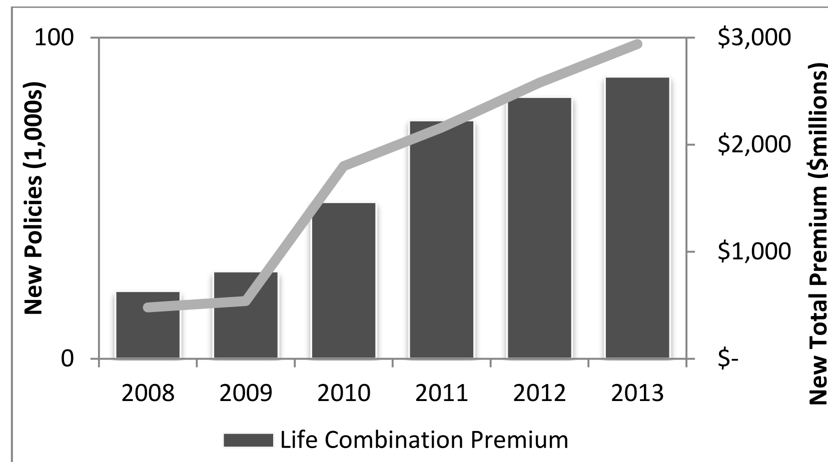
These events coalesced to form an ideal setting for the growth of life combination products. Many of the early products were fairly simple and clear-cut compared to other life insurance products. With life combination products, the need for LTCI is hedged. LTCI shoppers who worry about the possibility of not utilising the long-term care benefit are more satisfied with life combination products.

Another factor that further contributed to the growth of life combination products was the Pension Protection Act, which, starting in 2010, allowed for tax-free funding of LTCI when combined with life insurance or an annuity. This regulation also clarified the tax status of long-term care benefits from life combination products.

Combination products

Life combination products have experienced double-digit growth in the last five years. More than seven carriers have entered the market during this time and more are expected to in the near future. Total new premiums for 2013 reached US$2.6bn with just under 98,000 policies sold. Shortly after the tax clarification from the Pension Protection Act (2010), new products and new carriers began entering the life combination market.

Figure 3. Life Combination products sales—new total premium (US$ billions) and policies (1,000s)



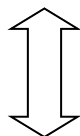
There are two distinct products within the life combination space: acceleration riders and extension of benefit riders. The most prevalent products (by number of policies sold) are the acceleration riders, where the death benefit from the life insurance is withdrawn for long-term care or chronic illness needs. More recently, due to the increase in carriers adding this rider to their product lines, the acceleration rider has developed into a "must have" for many agents. While the main objective of the sale is life insurance coverage, the added feature of the acceleration rider has been beneficial both from an agent and a consumer perspectives.

To promote the long-term care benefits of life combination products, stand-alone LTC has often been positioned as a "use it or lose it" proposition. LIMRA's past survey results have shown that the idea of life combination products resonates strongly with consumers. But once costs are figured in, the concept loses some of its lustre.

Table 1 compares the average annualised premium and benefit amounts for stand-alone LTC and life combination products based on LIMRA's *2011 ILTCI Sales Survey & Supplement* and *2012 Life Combination Survey*. Stand-alone LTC, by far, provides the cheapest LTC coverage. The key difference for stand-alone LTCI buyers is that a high number of them do expect to use the LTC benefits. While buyers for life combination products place more weight on the life insurance benefit.

Table 1. Average premium and benefit for LTC and life combination products

Consumers who feel more at risk for LTC



Consumers who feel less at risk for LTC

	Average Annualised Premium	Average Monthly Benefit/Life Death Benefit	Total Max. LTC Benefit
Stand-alone LTCI	$2,400	$5,000	$420,000*
Life combination —Extension of benefits	$6,950**	$109,000	$327,000**
Life combination —acceleration	$6,600	$326,000	$326,000

* Average LTC benefit based on $5,000 monthly benefit for seven years
** Annualised premium is 10% of single premium. Max. LTC benefit assumed to be three times the death benefit

Conclusion

At current sales levels, life combination products represent approximately 8 per cent of the U.S. individual life insurance market. Because of the sizable portion of single premium payments in life combination products, total premiums is used as a measure rather than annualised premiums. By contrast, annualised premiums is the standard measure for LIMRA's *U.S. Individual Life Sales Survey*.

LIMRA's *2013 U.S. Individual Life Combination Products Survey* consisted of 19 contributing carriers. While most carriers offer a LTC rider on one product, there is a growing trend to offer the riders on more products in the life insurance portfolio. As consumers increasingly understand the financial necessity of LTC insurance, life combination products could eventually become a permanent fixture for individual life insurance in the U.S.

Insurability of Cyber Risk[4]

By Christian Biener, Martin Eling and Jan Hendrik Wirfs[+]

Introduction

Every reported incident of data breach or system failure resulting in high financial or reputational loss increases decision-maker awareness that current insurance policies do not adequately cover cyber risks. There are many examples of the high economic and social relevance of cyber risk such as the recent NSA, Sony, or LGT data breaches. Recently, the G20 group denoted cyber attacks as a threat to the global economy—an assessment that is not surprising considering that expected annual losses from cyber risk are estimated between US$300bn and US$1tn,[5] whereas the respective 10-year average for catastrophic losses is only US$200bn.[6] Insurance is seen as one possibility for managing cyber risk exposure. The market, however, lags behind the expectations for this potentially huge new line of business with penetration levels estimated between 6 per cent and 10 per cent of companies.[7] In our analysis, we discuss the adequacy of insurance solutions to manage cyber risk.

Definition of cyber risk

The term "cyber risk" refers to a multitude of different sources of risk affecting the information and technology assets of a firm. The definition of cyber risk we employ here is a broad one and is based on how regulators of insurance and financial markets categorise cyber risk—that is, as operational risk. However, we focus on operational cyber risk here, referring to those operational risks relevant for information and technology assets. We thus define cyber risk as "operational risks to information and technology assets that have consequences affecting the confidentiality, availability or integrity of information or information systems".[8] Following the operational risk frameworks in Basel II and Solvency II, we categorise cyber risk into four classes: (1) actions of people (e.g. inadvertent loss of data by employee), (2) systems and technology failures (e.g. malfunction of hardware), (3) failed internal processes (e.g. insufficiently defined responsibilities), and (4) external events (e.g. fire).

Market overview

Commercial property and liability insurance is available in most insurance markets worldwide. However, property policies typically only cover damage to physical assets such as production facilities and exclude cyber risk, as also is the case with liability policies in general. In response to this setting, a specialised market providing coverage for cyber risks has emerged in recent years, most prominently in the United States.

As yet, however, market coverage is relatively low. Moreover, outside the United States, insurance coverage for cyber risk is not well known and not much used. In Europe, for example, about 25 per cent of corporations are not even aware that this type of insurance exists and only 10 per cent have purchased cyber risk coverage.[9] Figures for the United States show a similarly low average level of coverage of about 6 per cent, but large variations between industries among the Fortune 1000 companies.[10] According to Betterley, current annual gross premiums for cyber insurance in the United States are US$1.3bn and growing 10–25 per cent on average per year.[11] Continental Europe

---

4 This is the abridged version of the article to appear in *The Geneva Papers on Risk and Insurance—Issues and Practice,* Vol. 40, No. 1, 2015.

+ Institute of Insurance Economics, University of St. Gallen, Switzerland.

5 See McAfee (2013).

6 See Munich Re (2014).

7 See Willis (2013a, b), for the United States, and Marsh (2013), for Europe.

8 See Cebula and Young (2010).

9 See Marsh (2013).

10 See Willis (2013b).

11 See Betterley (2013).

is estimated to generate premiums of only around US$192mn, but this figure is expected to reach US$1.1bn in 2018.[12]

Methodology and results

In our paper we discuss the insurability of cyber risk along the lines of a set of common criteria to shed light on the causes of lacking cyber insurance market development. Baruch Berliner[13] introduced a simple, yet stringent and comprehensive, approach for differentiating between insurable and uninsurable risks. This approach, which is based on nine insurability criteria, is frequently used to analyse insurance markets. The criteria are categorised into three broad groups that classify risks in terms of actuarial, market, and societal conditions. We analyse each criterion, taking into account the findings from previous literature. In addition, for the actuarial criteria we extract cyber risk loss data from an operational risk database and analyse their statistical properties. In the following we list the main problems in insuring cyber risk and summarise the most interesting findings.

- **Development of frequency and severity of losses:** for the development of cyber risks over time we find the number of incidents before the year 2000 to be relatively small, which is not much of a surprise since digital economic values were still relatively limited. After that point, however, the number of incidents continuously increased and, in the last years, accounts for a substantial part of all operational risk incidents. These findings emphasise the increasing economic importance of cyber risk in recent years. One interesting observation, however, is that the average loss decreased over the last years, which indicates an increasing use of self-protective measures that reduce losses in the event of a cyber attack.
- **Risk pooling:** correlations among cyber risks can be relatively high as compared to other risks. In addition to the commonly cited small size of current cyber risk pools efficient risk pooling and diversification is problematic and hardly achieved.[14] The development of a viable cyber insurance market could thus benefit from increasing reinsurance capacity to better spread the exposure.
- **Scarcity of data:** a principal problem in insuring cyber risks is the scarcity of data and lack of understanding of this new type of very dynamic risk.[15] Insurers react to the high level of uncertainty by setting high deductibles and low maximum coverage that result in insurance policies that are of little value to many risk managers.
- **Risk of change:** dynamic changes of cyber exposures are often drastic and fast. Not only technical aspects of progress in hardware and software as well as the use of novel networks threaten stable loss estimates, the sphere of data and systems security and integrity also is prone to a significant degree of regulation that is adapted over time. An analysis of historical cyber risk data thus could be misleading if the nature of the underlying risk has undergone substantive change.
- **Information asymmetries:** moral hazard and adverse selection are often viewed as primary impediments to market development. The complex interrelations of modern information systems result in significant vulnerability to cyber risk even though single firms invest in self-protective cyber risk measures. The interrelated nature of information systems also makes it difficult to discover, much less prove, sources of losses and identity of perpetrators, which potentially increases a firms' reluctance to invest in self-protective measures.[16] In the extant cyber insurance literature, there is some evidence that firms that have experienced a cyber attack are more likely to purchase insurance, resulting in adverse selection.[17] Furthermore, the lack of data on cyber losses makes it difficult to sort firms into different risk types, thus amplifying adverse selection.[9]
- **Product value:** today's cyber insurance policies contain significant exclusions such as self-inflicted losses, the access of unsecure websites that will not trigger a claim payment. At the same time we observe relatively low cover limits of about US$50mn and exclusions of many indirect costs such as reputational losses.[18] Potential policyholders thus question the value of these products.

---

[12] See NAIC (2013).
[13] See Berliner (1982).
[14] See ENISA (2012).
[15] See Herath and Herath (2011), Gordon *et al.* (2003), Baer and Parkinson (2007), ENISA (2012).
[16] See Ögüt *et al.* (2011).
[17] See Shackelford (2012).
[18] See Mukhopadhyay *et al.* (2005), Gatzlaff and McCullough (2012).

Conclusion and recommendations

Significant economic impacts from and increasing media attention to cyber risk make managing it imperative. In this context cyber insurance has two virtues. One is that insurance coverage puts a price tag on cyber risk and thus creates incentives for risk-appropriate behaviour. The other is that simply by applying for cyber insurance, companies become more aware of and self-protective against this threat.

However, a number of problems with the insurability of cyber risk impede the market development. The main difficulties involve randomness of loss occurrence, information asymmetries, and cover limits. However, we are able to conclude on a positive note. With increasing market development, the insurance risk pools will become larger and more data will be available. In addition, we see room for improvement in systematic data collection. For instance, insurers could either combine resources and exchange data on a multilateral basis as is done, e.g., with operational risks in banking or alternatively regulators could provide a common platform for data sharing. The rate advisory organisations that exist, for example, in the form of the Insurance Services Organization (ISO) in the United States could provide a starting template. Government involvement may even be more feasible in the case of cyber risk for several reasons. One is the infancy of the industry that impedes the development of an independent organisation for this function. A second relates to the fact that governments can require data reporting whereas independent insurers cannot. A third reason is that government schemes should be more closely aligned with public interests than would be an independent entity. In addition, regular industry surveys may capture the dynamic changes affecting the cyber insurance market and provide guidance.

A number of new competitors have entered the market in recent years and more are planning to do so. This will increase insurance capacity and market competition and keep prices down. This is also a favourable development in the context of the criticised lack of sufficient reinsurance capacity. In light of our discussion in this paper, it would seem important to establish minimum standards on coverage limits and pre-coverage risk assessment as well as clear-cut definitions of cyber risk, all of which will reduce, if not eliminate, some of the problems of insuring cyber risk. Indeed, the consulting and risk assessment services of insurance companies prior to offering cyber insurance coverage seem to be a central driver of product value, thus increasing demand.

References

Baer, W. S. and Parkinson, A. (2007). "Cyberinsurance in IT Security Management", *IEEE Security and Privacy* 5(3): 50–56.

Berliner, B. (1982). *Limits of Insurability of Risks,* Englewood Cliffs, NJ: Prentice-Hall.

Betterley, R. (2013). "Cyber/Privacy Insurance Market Survey 2013: Carriers Deepen Their Risk Management Services Benefits—Insureds Grow Increasingly Concerned with Coverage Limitations, http://betterley.com/samples/cpims13_nt.pdf, last accessed: 16 December 2013.

Cebula, J. J. and Young, L. R. (2010). *A Taxonomy of Operational Cyber Security Risks,* Technical Note CMU/SEI-2010-TN-028, CERT Carnegie Mellon University.

Chabrow, E. (2012). "10 Concerns When Buying Cyber Insurance", last accessed: 18 January 2014.

ENISA (2012). "Incentives and Barriers of the Cyber Insurance Market in Europe", last accessed: 18 January 2014.

Gatzlaff, K. and McCollough, K. A. (2012). "Implications of Privacy Breaches for Insurers", *Journal of Insurance Regulation* 31: 195–214.

Gordon, L. A., Loeb, M. P. and Sohail, T. (2003). "A Framework for Using Insurance for Cyber-Risk Management", *Communications of the ACM* 44(9): 70–75.

Haas, A. and Hofmann, A. (2013). *Risiken aus Cloud-Computing-Services: Fragen des Risikomanagements und Aspekte der Versicherbarkeit,* FZID Discussion Paper, No. 74-2013.

Herath, H. and Herath, T. (2011). "Copula Based Actuarial Model for Pricing Cyber Insurance Policies", *Insurance Markets and Companies: Analyses and Actuarial Computations* 2(1): 7–20.

Marsh (2013). *Cyber Risk Survey 2013,* last accessed: 16 December 2013.

Mukhopadhyay, A., Saha, D., Mahanti, A. and Chakrabarti, B. B. (2005). "Insurance for Cyber-Risk: A Utility Model", *Decision* 32(1): 153–169.

McAfee (2013). *The Economic Impact of Cybercrime and Cyber Espionage*.

Munich Re (2013) *2012 Natural Catastrophe Year in Review*.

Munich Re (2014) *2013 Natural Catastrophe Year in Review.*

National Association of Insurance Commissioners (NAIC) (2013), "Cyber Risk," http://www.naic.org/cipr_topics/topic_cyber_risk.htm, last accessed: 7 December 2013.

Ögüt, H., Raghunathan, S., and Menon, N. (2011), "Cyber Security Risk Management: Public Policy Implications of Correlated Risk, Imperfect Ability to Prove Loss, and Observability of Self-Protection," *Risk Analysis* 31(3): 497–512.

Shackelford, S. J. (2012), "Should Your Firm Invest in Cyber Risk Insurance?" *Business Horizon* 55: 349–356.

Willis (2013a), "Willis Fortune 500 Cyber Disclosure Report," http://blog.willis.com/downloads/cyber-disclosure-fortune-500, last accessed: 16 December 2013.

Willis (2013b), "Willis Fortune 1000 Cyber Disclosure Report," http://blog.willis.com/downloads/cyber-disclosure-fortune-1000-2013, last accessed: 16 December 2013.

Cloud Computing: a Fundamental Shift in IT

By Farhad Khalilnia+

Synopsis

This article presents a broad overview of cloud computing, addresses common questions and some of the relevant issues that face sensitive and regulated industries such as finance and insurance.

Cloud coming-of-age

Cloud computing today refers to the process of leasing computing assets and the set of added services and assurances that accompany these assets, like provisioning services, backup systems, applications or service level agreements.

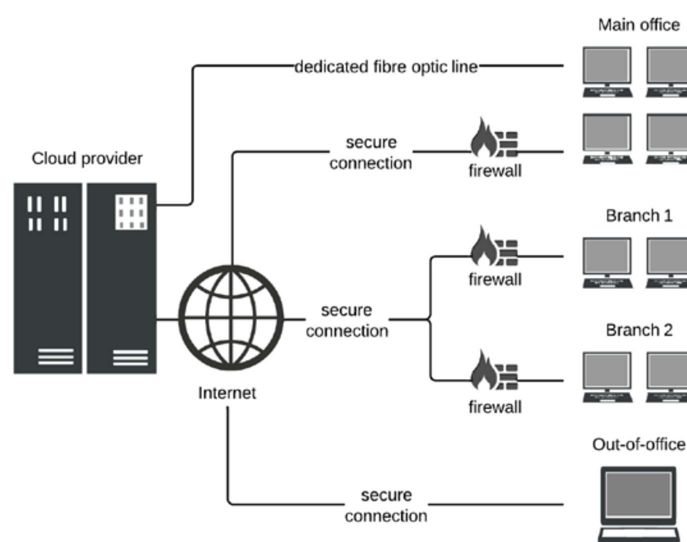
The recent surge in cloud computing is due the convergence of a number of technologies making it more secure, user-friendly and cost-effective, as well as a mindset shift as people have been exposed to the likes of Hotmail, Dropbox, Facebook and numerous other cloud-based services.

Developments in Internet networking now allow encrypted and secure connections across shared lines, virtual private networks (VPNs) and access to dedicated high-speed point-to-point connections across continents. Storage technologies have evolved to allow shared physical storage space—hard disks—with software separation without compromising confidentiality. Equally, the computing power—the CPUs and RAM—that runs the applications can be effectively shared and separated.

The above combination unlocks the potential for economies of scale in businesses that have traditionally thought it necessary to run their own IT infrastructures— similar to the advent of electrical power stations in the late 19th century, before which factories and wealthy households ran their own generators, including raw material sourcing, stokers and engineers.

It is now possible to plug into the net, use all of your computing resources as necessary, without concerning yourself with how it is provided, and pay one transparent flat fee.

Figure 1. A basic cloud set-up

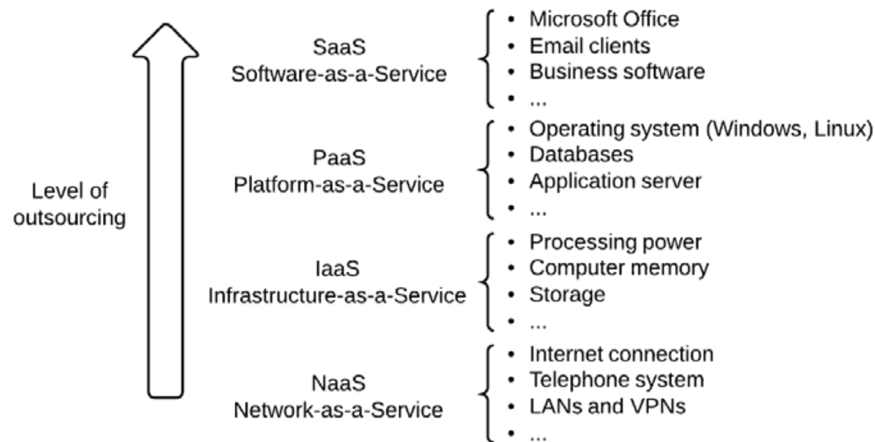


+ Farhad Khalilnia is founder and CEO of the Swiss private cloud provider Penta Corporate Hosting Ltd.. He was one of the pioneers of server-based IT infrastructures for business in Switzerland in the last 1990s. Penta is based in Geneva and Dubai, and specialises in compliant, audited and secure cloud-based IT for the financial sector and other sensitive industries.

How it works

There are different levels of IT cloud outsourcing, illustrated in figure 2 below:

Figure 2. Levels of IT outsourcing



Having an outside company manage your network or network-as-a-service, such as telephones, Internet connections and routers, is already widely adopted.

Outsourced infrastructure-as-a-service is also a familiar, typically local IT company that will install computers and servers in your office and dispatch technicians for maintenance. In a cloud set-up, there is still a need for basic desktop computers. However, these serve merely to connect to the off-premise hosted data centre, sending keyboard strokes and mouse clicks one way and receiving the monitor image on the other. Today's high-speed connections make the interaction seamless and office computers only need basic specifications as the real work takes place in the cloud.

Platform-as-a-service dispenses with the need to buy and maintain your own operating systems and databases. The necessary platforms are run from a data centre and delivered on a continuous basis—including updates, security patches, new versions and so on.

Software-as-a-service takes the concept a step further and delivers the end-user applications—the actual software used to work such as Microsoft Office and custom or off-the-shelf programmes.

Opportunities for risk mitigation

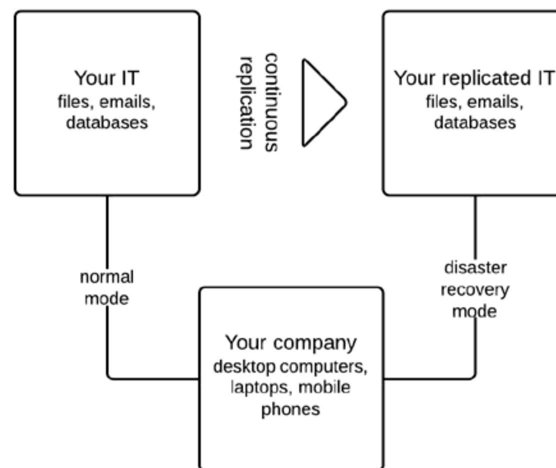
With IT so central to modern business, the cost of downtime or data loss can be high, even existence threatening. A properly run IT department will devote substantial resources to manage these risks.

Geographically separated and physically isolated data centres allows for easier and more cost-effective risk mitigation than an in-office server. For example, multiple electricity and internet suppliers, generators, fire suppression systems and biometric access controls among other safeguards can be designed for and brought in for several providers.

Virtual threats are managed centrally and for multiple clients simultaneously, meaning more and better equipment and expertise can be dedicated to implementing and monitoring processes, ensure quick reaction, and keep systems and knowledge up to date.

Business continuity and disaster recovery are well-developed disciplines that have evolved beyond the traditional backup copy. Deduplication ensures that multiple copies of files are only backed up once, while the parallel copying of multi-threaded restores drastically reduces the time to get back up and running again. Continuous active-active backup between data centres means minimal data loss at any given moment and the ability to automatically fail-over without the end-users even noticing that there is a problem.

Figure 3. Business continuity and disaster recovery set-up



Installing and maintaining a state-of-the-art business continuity and disaster recovery infrastructure is expensive and resource intensive. A cloud provider is able to use the same sophisticated infrastructure for many companies and spread the cost.

Is it secure?

Cloud is a very broad term that refers to innumerable different infrastructure set-ups. It is possible, for example, to have your own hardware and network connections set up in a completely "private" cloud with no physical sharing whatsoever. On the other end of the scale are "public" clouds where there is little or no control over where, how and with whom your data is stored.

One way to conceptualise it is to consider that the risk of intrusion or data loss is exactly the same in-house as in the cloud, given the exact same security measures. The question then becomes, can your in-house set-up match what a dedicated cloud provider can bring to bear? Does your server get knocked every time the vacuum cleaner goes by? Is all the hardware replaced every three years? Is access to the server room logged? Are the USB ports isolated from company data? How long will it take to restore the company network in case of a fire?

The technology today can completely separate data on shared hardware with zero leakage. You can also choose to have all your data encrypted so that not even the cloud provider can read it or have a physical key to access your own hardware within the external data centre.

Regulatory compliance

Regulated industries such as finance and healthcare are mostly required to meet certain standards in IT and data handling. Certification schemes and legislation vary, but generally involve meeting certain best practices with regards to hardware set-ups, operational processes, and keeping the data in certain jurisdictions. Previously, this translated into tight in-house control of IT that could be audited for regulatory compliance.

Cloud technology these days can meet and exceed the most stringent regulatory compliance standards, which means an interesting advantage over in-house IT—a single audit or certification ensures all the hosted companies meet the required compliance standards. Again, the costs can be spread across multiple clients.

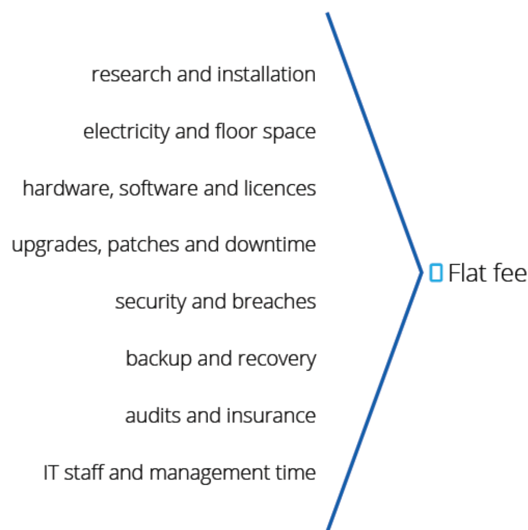
Changing cost structure

The true cost of in-house IT can be elusive—like when owning a car. The transparent costs include hardware, software licences and IT staff. However, the financial impact during the whole life cycle includes lost productivity while employees troubleshoot their own or colleagues' problems, purchasing research, migration expenses, electricity and floor space, downtime and recovery, training, insurance, decommissioning and auditing, among

dozens of other items. In a cloud set-up, most of these costs are managed by the provider while the business pays one flat predictable fee (see figure 4).

Capital expenditure on IT is reduced to barebones desktops or laptops while the outlay for heavy duty machines, servers, and allowance for future capacity is moved to scalable and predictable operational expenditure.

Figure 4. Total cost of ownership



Trust, but verify

The one disadvantage of outsourced cloud computing is a loss of control—at the end of the day, your data is being handled by an external supplier.

For that reason, it becomes critical that the custodian of your data plays it straight and transparent, and does not gloss over difficulties. Ensure they can deliver what is promised, that they are financially secure, and that you can take your data elsewhere if relations deteriorate.

The key to a successful outsourced cloud implementation is trust—backed by checks, certifications and auditing.

Career Opportunity:
Director – Financial Stability Programme

The Geneva Association is currently looking for a Director of its Financial Stability Programme, a key pillar of the Association's global activities.

The successful candidate will lead the Association's research in this area, including the development of subject matter expert networks and the oversight of relevant publications and reports. S/he will also be actively involved in discussions on financial stability and regulation, and an integral part of the dialogue with Members, regulators and relevant institutions.

S/he reports directly to the Secretary General. The working language is English and the role is based in Basel.

Download complete job description.

Interested candidates should send their CV and an accompanying covering letter to applications@genevaassociation.org.

THE RESEARCH PROGRAMME ON INSURANCE AND FINANCE

The research programme on insurance and finance comprises academic and professional research activities in the fields of finance where they are relevant to the insurance and risk management sector.

The programme is dedicated to making an original contribution to the progress of insurance through different initiatives in the field of insurance and finance. It engages in: highlighting issues of key importance, promoting studies of the function of finance in insurance, discussing the relevance of financial concepts and instruments to the industry, detecting new and promising theoretical developments and diffusing knowledge and the results of research worldwide.

The Geneva Association

The Geneva Association is the leading international insurance think tank for strategically important insurance and risk management issues.

The Geneva Association identifies fundamental trends and strategic issues where insurance plays a substantial role or which influence the insurance sector. Through the development of research programmes, regular publications and the organisation of international meetings, The Geneva Association serves as a catalyst for progress in the understanding of risk and insurance matters and acts as an information creator and disseminator. It is the leading voice of the largest insurance groups worldwide in the dialogue with international institutions. In parallel, it advances—in economic and cultural terms—the development and application of risk management and the understanding of uncertainty in the modern economy.

The Geneva Association membership comprises a statutory maximum of 90 Chief Executive Officers (CEOs) from the world's top insurance and reinsurance companies. It organises international expert networks and manages discussion platforms for senior insurance executives and specialists as well as policymakers, regulators and multilateral organisations. The Geneva Association's annual General Assembly is the most prestigious gathering of leading insurance CEOs worldwide.

Established in 1973, The Geneva Association, officially the "International Association for the Study of Insurance Economics," has offices in Geneva and Basel, Switzerland and is a non-profit organisation funded by its Members.

The Geneva Association Insurance and Finance Newsletter, N° 14, August 2014

This newsletter for finance directors, senior financial managers in insurance companies and researchers in the field of finance is published by The Geneva Association as an information and liaison bulletin to promote knowledge and understanding of financial issues in insurance. It also fosters contacts between finance experts at insurance companies and at universities and other institutions with an interest in insurance. Any suggestions concerning the content or layout of the newsletter are welcome. Please notify us if you are interested in receiving this publication regularly. To subscribe to the Newsletter (hard copy or electronic version) please go to www.genevaassociation.org/subscriptions.

Editor: Etti Baranoff, etti_baranoff@genevaassociation.org. **Production:** Valéria Pacella
Available at www.genevaassociation.org

The opinions expressed in Geneva Association newsletters and publications are the responsibility of the authors. We therefore disclaim all liability and responsibility arising from such materials by any third parties.

© 2014, The Geneva Association, Route de Malagnou 53, CH- 1208 Geneva. Tel: +41 22 707 66 00

ISSN: 1662-050X

FORTHCOMING CONFERENCES OF THE GENEVA ASSOCIATION

2014

September

15-17	St. Gallen	**41st Seminar of the European Group of Risk and Insurance Economists (EGRIE)**, sponsored by The Geneva Association
22	Munich	**International Colloquium on Global Capital Standards (BCR, HLA, ICS)**, hosted by Munich Re

October

23-24	New York	**6th EE+CR Seminar on "Cities under siege—extreme events, resilience and the role of insurance"**, organised in collaboration with and hosted by XL Group

November

4	London	**10th International Insurance and Finance Seminar of The Geneva Association**, hosted by Prudential plc
6-7	Madrid	**11th Health and Ageing Conference on "Emerging health risks and insurance"**, hosted by MAPFRE Foundation
18-19	Munich	**10th CRO Assembly**, hosted by Munich Re

2015

May

13-16	Singapore	**42nd General Assembly of The Geneva Association**, hosted by the Monetary Authority of Singapore (Members only)

August

2-6	Munich	**3rd World Risk and Insurance Economics Congress (WRIEC)**, organised by EGRIE in cooperation with APRIA, ARIA and The Geneva Association

2016

June

8-11	Rome	**43rd General Assembly of The Geneva Association**, hosted by the Italian Members (Members only)