The Geneva Association

The General Assembly

review

2012

The Geneva Association
(The International Association for the Study of Insurance Economics)

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 policy-makers, 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.

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Secretary General's Statement

John H. Fitzpatrick
Secretary General

Welcome to The Geneva Association's 2012 *General Assembly Review*.

While I was appointed Secretary General at the start of The Geneva Association General Assembly, my familiarity with the Association is longstanding. It is a truly unique organisation, not least due to this annual gathering of insurance leadership where in-depth discussions on the strategic issues that face the insurance industry are held with and alongside regulators, academics and other experts.

The General Assembly is a fascinating vignette of the opportunities, challenges and strategic considerations occupying our Members and the wider industry. It is not only a moment when key Association research is presented and discussed, but also a time when themes and concepts for ongoing research are formulated and developed. This review therefore provides the reader with an insight into the discussions over the busy two days in Washington this year and a flavour of the concerns and deliberations of some of the leading figures in the global insurance industry.

The Assembly was particularly pleased to welcome IMF Managing Director, Christine Lagarde, as a keynote speaker. Her perspective as a central actor and commentator in the continued attempts by politicians to break free from the world economic crisis was both interesting and instructive. Her views on the crisis, the role of insurance as a stabiliser in economies and the implementation of systemic risk regulation are provided on page 7 of this report.

Members also welcomed presentations from Senator Mark Warner of Virginia on the issue of the U.S. debt crisis (page 13) and Michael McRaith, Director of the newly formed Federal Insurance Office (FIO). Mr McRaith (page 19) provided his perspective on the key considerations for the development of the international regulatory architecture in the coming months and the importance of complementarity and compatibility of regulations between the U.S. and the EU. Gabriel Bernardino also commented on the development of Solvency II (page 20) as Chairman of the European Insurance and Occupational Pensions Authority (EIOPA).

While the impending creation of new rules for insurers regionally and internationally are understandably an area of focus of our Members and therefore our research, the Assembly also focused on broader and longer-term issues for the industry. The growing challenges of ageing populations and the changing climate are two good examples of areas where insurance can and does play a significant role in societies and economies.

As an industry, insurance arguably represents the best placed private sector counterparty to offer solutions to these and other challenges, and relieve governments of some of the growing financial burden that these challenges represent. The publication and press conference on the Geneva Reports No 6, *Addressing the Challenge of Global Ageing—Funding Issues and Insurance Solutions*, the day before the Assembly, set the scene and highlighted areas where the insurance industry can offer solutions to this fundamental and global challenge. A review of the press conference and an article on the subject can be found on pages 23 and 25 respectively.

The Assembly also featured presentations from academics and industry experts on low probability, high-impact events including pandemics,

Secretary General's Statement

space weather and cyber-risks. A break-out session on the United Nations Environment Programme—Finance Initiative's (UNEP-FI) Principles for Sustainable Insurance was also held, providing CEOs with an understanding of the considerations that signing the following week in Rio de Janeiro would entail.

As well as the presentations and discussions, the Assembly provided Members with an excellent opportunity to meet and network amongst each other, as well as with regulators and other invited experts. With more than 50 CEO attendees the sessions proved to be vibrant, often leading to vigorous discussions on the issues that are facing our industry.

Next year will be The Geneva Association's 40th anniversary and the General Assembly will be hosted by our London-based members. It promises to be a landmark event. I look forward to welcoming Members to that anniversary meeting. Of course, we will continue to keep Members and our networks updated on these important topics between now and the General Assembly in London next year.

I hope you enjoy the report.

John H. Fitzpatrick
Secretary General
The Geneva Association

Financial Stability

“Breaking from the cycle of crises”

Christine Lagarde,
Managing Director,
International Monetary Fund

In her speech to the Members of The Geneva Association in Washington, D.C. during the Association's General Assembly, Christine Lagarde, Managing Director of the International Monetary Fund (IMF), touched upon the difficulty for insurers to maintain their stabilising role for the global economy in the current environment of low interest rates and market volatility.

“There is an urgent need to break free of the cycle of crises,” she said, while pointing out that “efforts by central banks and policymakers to restore calm in the markets have not had the intended effects” and that fears of a deepening crisis have returned. The IMF foresees 1.5 per cent growth in developed countries for 2012, with modest recession in the eurozone. With 5.75 per cent growth, emerging markets provide the only bright spot, said Lagarde, but this may not last as growth is abating in many areas.

Lagarde highlighted several factors of global concern:

- A worldwide employment crisis: 200 million unemployed in total, of which 75 million young people, or one in five; in Southern Europe, the ratio is closer to one in two.
- The U.S. is approaching a fiscal cliff, as automatic tax increases and spending cuts are scheduled to take effect in early 2013.
- The geopolitical crisis in the Middle East.
- Potential spikes in oil prices.
- Lack of progress in reducing debt in the U.S. and Japan.

Quoting Samuel Beckett, “the sun shone, having no alternative, on the nothing new,” Lagarde said policymakers have been reactive rather than proactive, offering solutions that are “too little too late. We can't carry on. There has to be something new.”

To break this behind-the-curve cycle, Lagarde said there has to be a determined and concerted effort on several fronts in the eurozone:

- Accommodative monetary policies should be maintained and the European Central Bank should remain ready to use unconventional tools such as addressing liquidity concerns. Use of common resources to provide direct support to banks would also help relieve tensions.
- Fiscal adjustments must be gradual and steady. If growth is worse than expected, governments should maintain fiscal measures rather than fiscal targets.
- The deeper integration of Europe should be expressly stated. If people know where Europe is headed, this will provide more certainty. Monetary union will need to be supported by financial and fiscal integration, including unified supervision, a single bank resolution authority with a common backstop, and a single deposit insurance fund.
- Serious structural reforms are required in product markets, and should go hand-in-hand with labour market reform, to provide more flexibility and allow the disenfranchised (youth and long-term unemployed) to find their way back to the workplace.
- There needs to be an emphasis on long-term sustainability over short-term gains.

“You are key actors in attaining global financial stability. As such, you must take into account not only the stability of your institutions but also the stability of the system as a whole.”

With regards to financial regulation, she recognised the progress made under Basel III, but noted the agenda was not finished and called for greater consistency to avoid arbitrage. She also highlighted the need for a balanced view from the insurance industry, “not just from your own backyard,” and asked insurers for a greater appreciation of the public interest because of the volume of liabilities and assets involved. “The debate on G-SIFIs is important to address sectoral interests and protect the general public interest,” said Lagarde. She agreed that there is a lack of a harmonised view in insurance regulation, particularly between the U.S. and Europe, and that much more work needs to be done.

As priorities, Lagarde listed the need for credible, coordinated and consistent regulation that encompasses a larger field; proper and well-functioning supervision; and greater accountability, meaning that CEOs must be accountable for their institutions, risk management should be enacted at the highest level of reporting, and incentives systems must be aligned with the long-terms goals of institutions. “You are key actors in attaining global financial stability. As such, you must take into account not only the stability of your institutions but also the stability of the system as a whole.”

Following her speech, Henri de Castries, CEO, AXA Group, returned to the current difficulty for the insurance industry to act as a stabilising force on the world economy because of misguided regulation and monetary policies that are maintaining artificially low interest rates. Lagarde said that a way out of this situation will require short-term solutions as well as more systemic principles and a long-term vision to renew investor confidence.

“The best way for the insurance industry to safeguard its role as a stabiliser is imperatively to engage in constructive dialogue with the actors designing the regulatory framework.”

She added that the best way for the insurance industry to safeguard its role as a stabiliser is to engage imperatively in constructive dialogue with the actors designing the regulatory framework. “There has to be a level of convergence to avoid territorial disputes and turf issues, otherwise we will have arbitrage that will hurt the insurance sector and public interest.”

Terri Vaughan, CEO, National Association of Insurance Commissioners (NAIC), said that by localising risks, insurance has provided a structure that aids in national supervision—but big companies are also international players and the ability to move risks around must be guarded against. Vaughan asked therefore to what segment of the business will regulation apply? Over which segments will supervisors have jurisdiction?

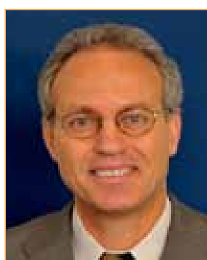
Lagarde disclaimed any in-depth knowledge in this specific area to respond properly to Terri Vaughan, though she did touch upon the long-term nature of the insurance business model and the fact that it was different in this regard to banking. However, Largarde also said it seemed to her unlikely that no insurance or reinsurance company will be designated as G-SIFI at the end of the process, in answer to a direct question by Nikolaus von Bomhard on the subject.

Responding to Denis Kessler, Chairman and CEO, SCOR, on the issue of an end to globalisation, Lagarde agreed that there is increased fragmentation and renationalisation of risks and activities after decades of globalisation, as well as increased populism and nationalism. She pointed out, however, that there is also a concerted drive by those most likely to lead others to move forwards with integration and in finding collective solutions, because they understand the dangers of fragmentation, and stated that she believed there would be a coalescing around the benefits of globalisation.

Christine Lagarde, Managing Director, IMF, and Henri de Castries, CEO, AXA.

In her concluding remarks, Christine Lagarde highlighted the work done by the IMF in assessing the observance of IAIS guidelines for institutions in systemically risky countries, and in carrying out stress tests and proposing stress test methodologies in developing countries. She also spoke about assessments carried out by the IMF with regards to risks that can destabilise world economies, providing political leaders with a certain level of information so that they can make informed decisions. “We are going to be very close to the cliff in the U.S. and to the abyss in Europe, but this might be necessary for the required reforms to be implemented,” said Christine Lagarde.

Long-term stability in a volatile world



*by Daniel Haefeli,
Head of Insurance
and Finance,
The Geneva Association*

A current vital concern for the insurance industry is the pervasiveness of low interest rates that affect its ability to play a long-term, stabilising role for economies and may in fact imperil its resilience to short-term shocks.

Conditions in the financial world today make for what Henri de Castries, CEO of AXA Group and Chairman of the Discussion Session I at the General Assembly in Washington D.C., called "the Perfect Storm": extremely low interest rates, a poor equity market and high volatility.

The situation of low interest rates in dominating economies, with a high spread in others, is expected to last—at least for the five coming years, according to Henri de Castries, who also touched upon the effect of low interest rates for insurance on long-term savings, inflation instability with the risk of sharp rises later, market distortion and excessive leverage.

In this environment, insurers must maintain an active asset-liability-management (ALM), diversify their products, tighten their reinvestment policies and increase margins. They can also reduce the interest rate sensitivity of life savings products through a variety of features such as flexible or lifetime guarantees or surrender charges, according to panellist Kurt Karl, Chief Economist at Swiss Re.

Life insurance is particularly suffering from low attraction and low investment yields, affecting profitability and causing an ALM challenge. Non-life insurers suffer less from a low-interest environment because of the short time lapse between premium income and claims payments, which means a higher rate of short-term investments with limited exposure to decreasing interest rates.

For existing business, "where liability duration is perfectly anticipated and is matched by the asset duration, insurers are immune from interest rate movements," Karl said. However, "because insurers' price adjustments to lower investment yields tend to be gradual, a prolonged period of low interest rates is usually not favourable for non-life insurers' profitability. Nevertheless, the increase in insolvency risk is small when interest rates decline."

Ideally, "interest rates will later begin to rise gradually, returning to an historical average over the next decade," said panellist Michael Sproule, CEO of New York Life Insurance Company. There is the risk, however, that, on the one hand, interest rates remain flat for the next ten years or more, as in Japan; on the other, that they spike because of expansive monetary policy, which begs the key questions of "when?" and "by how much?"

Savings and consumption rates are also affected by low interest rates and slow growth. In such an environment, individuals feel less compelled to save and more inclined to consume. Indeed, as highlighted by Michael Sproule, the U.S. is experiencing inadequate savings (1 to 4 per cent) at the same time consumption has risen above 70 per cent of GDP.

Accounting, volatility and uncertainty

Between the point of sale of a policy and the moment the policy is completed, an insurer expects to make a certain amount of cumulative

profits. Until the policy is actually completed, however, the virtual amount of profits can vary substantially. For this reason and because assessment generally does not match business methods, the insurance sector is subject to a mismatch in assessing assets and liabilities. As Michael Spoule indicated, it can in fact increase volatility and capital requirements.

> "In times of crisis, consumers don't run from the insurance industry because they have a fundamental confidence in the stability of the system."

He further pointed out that over the past 15 years, price-to-book value multiples have dropped from a high of 2.37x to 0.68x, creating a situation where the par ratio of 1 no longer constitutes a floor but a ceiling. This increases the pressure for further capitalisation at a time when the insurance industry has seen heavy value destruction—market capitalisation of top global life insurance companies has dropped from US$1.2tn to $700bn in five years.

Uncertainty does not only affect the macroeconomic environment. It also pervades the political arena, the regulatory situation and, in many countries, characterises legislative decisions. Faced with such volatility, low growth and high fixed costs, Michael Sproule suggests strategic alternatives for insurers, such as acting as low-cost commodity providers and differentiating their individual business model from competitors.

Spoule underlined the fact that "insurance is a fat-tailed business in a fat-tailed world," affected by sudden and heavy-impact catastrophes that increase people's sense of vulnerability. He cited in the last 100 years: two world wars, 1918 pandemic, the Great Depression, the interest rate spike of 1979-1982 and the 2007-2008 global financial crisis. "Bad things happen on a regular basis," said Sproule. "The questions are: what will they be, how bad will they be and are we prepared for them?" He conveyed quite accurately the sentiment of CEOs regarding the current climate by saying: "The world is a mess but this is a group that can do something about it."

Terri Vaughan, CEO, NAIC.

An historical perspective

Basing her comments on a review of the important role played by insurers as a source of stability during the Great Depression, panellist Terri Vaughan, CEO of the National Association of Insurance Commissioners (NAIC), concurred that "history has demonstrated that, with their focus on long-term value and not short-term market value volatility, insurers do not have the same pressures to sell in a down market, and they are usually among the first to start buying. Thus, they do not add to instability, rather they can serve a stabilising role."

Indeed, the 1929 stock market crash, which precipitated a global financial crisis that lasted well into the 1930s, led to discussions and regulatory debates that are somewhat mirrored in the current supervisory climate, ultimately resulting, in December 1931, on a vote to cease using current market values for insurer's financial statements. In effect, "we are relearning the lessons that were learned by scholars and supervisors during the Great Depression: market prices don't necessarily reflect fundamental values," said Vaughan.

The current debate on accounting standards should take into account the long-term view, with the inclusion of market disclosures, in particular to safeguard against "zombie" companies. Terri Vaughan believes that regulators understand today the long-term nature of the insurance business and that if a vote took place now, regulators would take the long-term view by a margin of two to one. She further emphasised that "the debate about whether mark-to-market accounting for assets contributes to contagion in a financial crisis is critical for the insurance sector. If fundamental values and market values can deviate in the short term, a sector that can ride out this volatility has an important role to play. (...) There is good reason to believe that, where the business is long-term, market-consistent valuation may not be optimal."

"The world is a mess but this is a group that can do something about it."

Highlighting this importance of general purpose accounting requirements for reporting and valuation, Nikolaus von Bomhard, Chairman of The Geneva Association and Chairman of the Board of Management at Munich Re, suggested that there are two ways to address the issue: one can base assets on market value and provide an explanatory note on the long-term view; or provide amortised values with a note on the real value of assets.

Terri Vaughan concluded her presentation by noting that since the 1930s many new products have been developed by the insurance sector, and corporate structures have changed. Nevertheless, the life insurance sector is demonstrating a similar resilience and playing yet again a stabilising role in the ongoing financial crisis that began in 2008. It would appear that this is implicitly understood by consumers, who exhibit a fundamental confidence in the stability of the insurance system in times of crisis.

■

From left to right: *Henri de Castries, CEO, AXA; Kurt Karl, Chief Economist, Swiss Re; Michael Sproule, Executive Vice President and CFO, New York Life Insurance Company.*

Mark Warner: "Debt reduction, an urgent priority"

Senator Mark Warner of Virginia addressed Members of The Geneva Association on the issue of the debt crisis, which he has worked on since assuming his office in 2009. In particular, he serves on the Committee on the Budget, as well as that on Banking, Housing and Urban Affairs (including the Subcommittee on Securities, Insurance, and Investment).

Warner began by commenting on the lack of current political leadership in the U.S. as well as in Europe, and painted a sober picture of the U.S. economy with US$16tn of debt and too wide a spread between federal spending at 25 per cent of GDP and the revenue tax rate at 15.5 per cent. "We need to cut programmes and raise revenue," said Warner.

He noted that as the world's reserve currency, the U.S. had a little more running room for debt reduction but that it remained an urgent priority. Referring to a bipartisan plan currently under review in the Senate that adapts the Simpson-Bowles reform to reduce the debt by US$5tn over the next 10 years and move the debt-to-GDP ratio down, Warner admitted that "the chances of success [in passing legislation] are probably nil until the elections." The Senator added, however, that there was standby legislation in the event of an emergency such as a crisis in the Middle East or if Europe unravels.

The automatic cuts that take effect early next year, concomitant with the end of the Bush taxes, form a "self-imposed crisis" which, Warner hopes, "should prompt action from the House to adapt the bipartisan approach." He recognised that there were structural strengths to the U.S. economy but that the country must now show political leadership, adding that "we need business leadership that is supportive of these actions. There is little institutional support for political action. We need your voice."

The Senator concluded by citing former U.K. Prime Minister Winston Churchill, "You can always count on the Americans to do the right thing—after they've tried everything else," adding that he believes that the U.S. is approaching the moment when it has tried "everything else." It is now time for the U.S. Government to step up and Warner thinks it will. "It should not be this hard. If we get through this, the administration can do the work it is supposed to," he said.

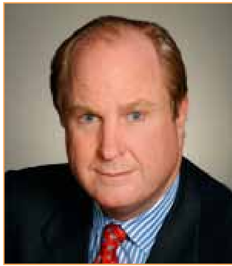
In response to a question by Henri de Castries, Chairman of the Management Board and CEO, AXA Group, on the effect of low interest rates on future instability and the insurance industry's ability to invest long-term, Mark Warner agreed that monetary policy has replaced fiscal policy, but that this should change when a credible budget deal is signed. He urged Members present to keep up the pressure on political leaders.

The session ended with a question from Charles Brindamour, CEO, Intact Financial Corporation, on the key points of the emergency budget plan. Warner answered that in the event of a crisis the starting point will be more tax reform, notably to reduce and eliminate spending in the tax code in the form of credits and deductions, and reducing the differential between capital gains and income tax rates. The ultimate goal is to turn the 50-page Simpson-Bowles report into an actual legislative report that combines US$1.2tn in additional revenue with cuts in healthcare and entitlement programmes, interest rates, and discretionary spending.

Industry Valuations: Then, Now and Future

by John Strangfeld,
Chairman and CEO,
Prudential Financial Inc.

and



by Donald Guloien,
President and CEO,
Manulife Financial,

Chairmen of the discussion session on Industry Valuations

The financial crisis of 2008-2009 proved to be deeper and more severe than ever expected. What started out as a credit crisis effectively shut down the capital markets. All asset classes became correlated and there was very little differentiation in valuations within the financial services sector. Valuation multiples fell significantly for all sectors in financial services, regardless of performance, and volatility was unprecedented. While the insurance industry was relatively unscathed from the crisis in terms of operating fundamentals, this was not reflected in share prices.

Since the market has recovered, the insurance industry's valuation has not returned to pre-crisis levels. It is important to examine the possible reasons for the lag in share price performance and investors' expectations under the "new normal" market conditions. It is also necessary to analyse the insurance industry's potential and the potential catalysts for achieving higher valuations.

In the aftermath of the crisis, there was a distinct difference between its real impact on the insurance business model and the combination of operating fundamentals and investor perspective. Investors viewed the crisis as a total meltdown with dramatic consequences and expressed major concerns about asset quality, capital adequacy and liquidity. There was also a loss of confidence in financial statements as values for major financial names evaporated.

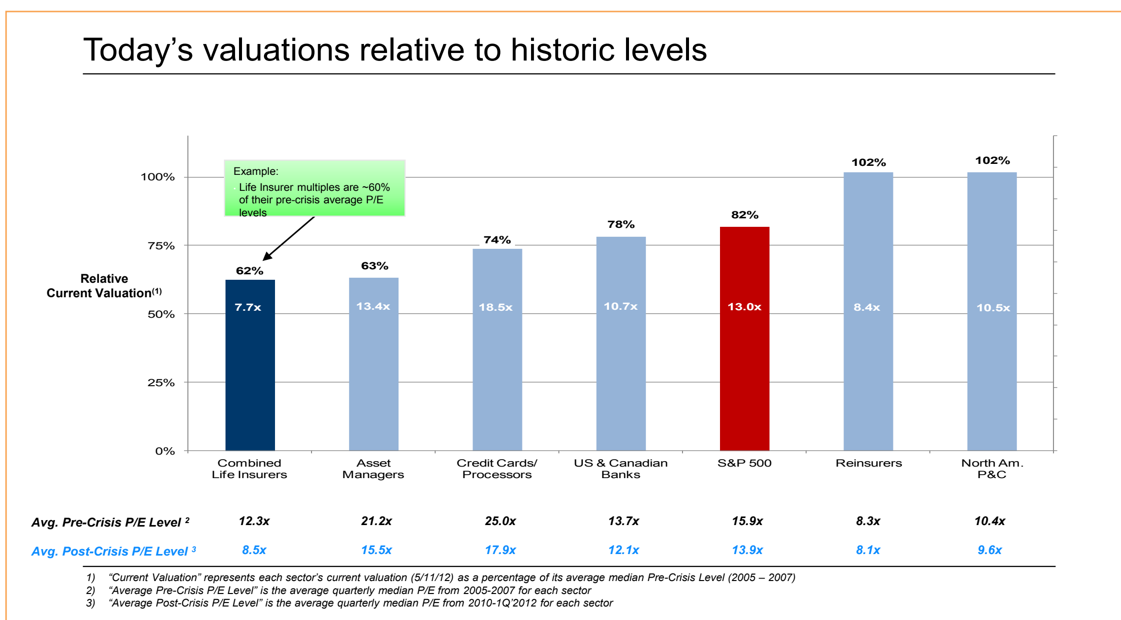
In reality, the insurance business model benefited from continued recurring revenues and stable liability structures, experienced minimal change in the number of surrenders and lapses, and saw only a modest impact on asset management fees, including incentive fees. Customer demands for insurance solutions continued to drive sales. Business lines were unaffected from a regulatory perspective, and US GAAP margins remained intact, but some concerns about future profitability arose such as, inter alia, the impact of persistent of low interest rate guarantees, policyholder optionality and the effectiveness of hedging.

Lasting impact of the crisis, downward pressure on valuations

During the crisis and beyond, there has been heightened government and regulatory scrutiny and even intervention. Industry participants took several actions as a result of the crisis and continue to pursue these actions today. Amongst these are de-leveraging; intensifying their focus on liquidity; exiting non-core businesses; conserving capital; varying the quality of capital; curtailing capital distributions, repurchasing shares and cutting dividends; and creating product lines that are more shareholder-friendly by raising prices and de-risking products.

Today, several lasting impacts arising from the crisis risk putting more downward pressure on industry valuations. More regulation, SIFI designations at domestic and global levels, Solvency II, the Volcker Rule and related uncertainty are weighing on valuations. Increased capital requirements will lower returns on equity (ROEs) and less leverage will limit potential revenue. The need for more liquidity will also come at a cost. In this environment, investors will remain very cautious—a significant hangover from seeing financial services icons collapse during the crisis. As a result, a substantial amount of money remains on the sidelines in the form of cash and bonds.

In the case of life insurers, the impact of lower ROEs and a higher cost of capital/risk premium appear to be pushing share prices lower. Life insurers' book value per share is roughly 25 per cent higher than it was at the beginning of the crisis; however, price-to-book value is some 60 per cent lower, declining from 1.9x in June 2007 to 0.8x in December 2011.



Source: Prudential Financial.

Though life insurers' ROEs are lower, the risk-free rate is also lower. The 10-year U.S. Treasury rate dropped to 2.8 per cent in 2011 versus 4.6 per cent in 2007. Given the reduction in risk-free rates, it is worth asking whether investors should be seeking lower ROEs from potential investments. But due to lower ROEs, a lower interest rate environment and uncertain capital requirements, as well as a potentially higher cost of capital/risk premium, life insurers' valuations have not recovered to the same extent as other sectors. By contrast, reinsurers and North American P&C insurers have recovered their pre-crisis valuations.

> "Cash is the only language investors are likely to understand in insurance."

Without doubt, the competition for investors' capital is fierce. Investors are not only looking at the risk and return potential of life insurers relative to pre-crisis, they are also comparing life insurers against other possible equity investments, such as industrials and consumer discretionary companies that are generating annual returns of as much as 21 per cent.

Surprises and volatility during the crisis, the interest rate environment, the European situation, credit losses and regulatory uncertainty are all reasons explaining a potentially higher risk premium. Sigmund Gjesdal, Fund Manager Norges Bank Investment Management in London and panellist at the discussion session II, pointed out that these are exogenous factors over which the insurance industry has little control but that could

contribute to enabling insurance sector valuations to recover: "Certainly, regulatory uncertainty must be removed. The global SIFI designation process is having a negative impact."

Improving insurance sector valuations

There are factors, however, which insurers can control and measures they can take. In particular, they can adapt business models: "Simplify, de-risk, increase capital generation and return," Gjesdal said. The insurance sector must also address specific concerns such as updating assumptions and outlooks in case of new interest rate drops, demonstrating to investors the ability to adapt to new situations, providing more product detail and introducing new products that are shareholder- and consumer-friendly.

Insurers should be very conscious of investors' views on risk and desire for capital discipline. They should also aspire to a return to realistic levels of valuations, regarding 2007 more as a bubble than a standard, Gjesdal suggested. They can then achieve those levels by letting valuations "take care of themselves." Catalysts for reaching historical or realistic valuation levels include focusing on performance (muted by concerns about sustainability and "reaching for yield"), presenting a clear strategy that involves growth and capital deployment, improving transparency and communication (providing economic and product information), and aiming for strong and active capital distribution.

From left to right: *Donald Guloien, CEO, Manulife Financial; John Strangfeld, CEO, Prudential Financial Inc.; Davide Serra, Algebris Investments; Sigmund Gjesdal, Norges Bank Investment Management.*

Putting life back into life stocks

Life insurers weathered the 2008 financial crisis relatively well. Despite life insurers' earnings and book value per share proving more resilient than banks and life insurers' ROEs showing less volatility throughout the crisis, investors refuse to put a higher multiple on the life insurance sector, said panellist Davide Serra, Founding and Managing Partner of Algebris Investments. Indeed, the de-rating of U.S. life insurance companies was worse than that of banks and Europe experienced a massive de-rating of insurance as well. U.S. life insurers and European life and multiline insurers are experiencing a higher cost of capital, in some cases quite sharp increases.

Investors' concerns with life insurance include:

- the lack of consistent cash flow and a constant definition of cash flow—a key issue for valuation;
- risks surrounding variable annuities, negative spread of new business and low interest rates;
- concern over regulatory interference; and,
- the lack of clarity of profit appropriation between policyholders and shareholders in certain situations.

Based on these concerns and the argument that "cash is the only language investors are likely to understand in insurance," Davide Serra suggested that life insurers should seek to strike a successful balance between growth and cash flow to shareholders. In particular, share count should be reduced and cash returned to the investor base—investors will then have the cash to return it to the insurer.

He further advised insurers to simplify their annual reports and balance sheets, and clarify their free cash flow. "Investors prefer cash cows to empire builders and black boxes," said Serra. This last advice generally summed up the very insightful—and provocative—suggestions made to CEOs by the panellists at the discussion session on valuations, as they addressed many questions and concerns on how to reassure and expand the investor base in an uncertain and volatile financial environment.

"There was a disconnect with regard to the financial crisis between investors' perspective and the real impact on the insurance business model and operating fundamentals."

The Supervisory Framework

The Geneva Association has been contributing to the regulatory and supervisory debate since 2009. At this year's General Assembly, the Association invited speakers Michael McRaith of the Federal Insurance Office (FIO) and Gabriel Bernardino of the European Insurance and Occupational Pensions Authority (EIOPA) to update members and answer their questions about the current status of the supervisory framework in Europe and the United States.

“Clarity, compatibility and complementarity”

Michael McRaith, Director, Federal Insurance Office

In his speech to the Members of The Geneva Association, Michael McRaith, Director of the Federal Insurance Office (FIO), touched upon the internationalisation of insurance and the demographic changes that are affecting society and economies such as longevity, the growth of the retirement-age population, and the development of the middle class in emerging economies.

McRaith then highlighted the importance of international supervisory standards that can enable the insurance industry to move into new jurisdictions and compete on an equal footing. He cited as an example the opening of the car insurance market in China and its enormous potential, with around 1,000 new drivers each day in Beijing, a city that represents only 2 per cent of the country’s population.

“Policies should be based on facts as insurers experience them every day, not ideals or theories,” said McRaith, underlining the need for a practical rather than ideologically-driven approach to regulation, and for building a staff that understands insurance as a risk-transfer vehicle. He said that in this regard, the FIO is participating in, and coordinating for the U.S., a dialogue between EU and U.S. insurance supervisory authorities. This dialogue will conclude in December 2012 and will provide clarity for those insurers operating in both U.S. and European jurisdictions. “The objective is compatibility and complementarity between the EU and the U.S.” repeated McRaith on several occasions during his speech.

Reverting to ComFrame, the Common Framework for the Supervision of Internationally Active Insurance Groups initiated by the International Association of Insurance Supervisors (IAIS) in July 2010, McRaith said that “it is a difficult and onerous process but an essential one.” He declared himself encouraged by the spirit of commitment shown by supervisors around the world and said not to heed false alarms on compliance issues. “ComFrame intends to reduce regulatory impediments for non-domestic entities to lead emerging markets to greater privatisation and help insurers seeking to expand,” he said.

With regards to the designation of financial institutions as systemically risky, McRaith agreed that insurers should not be treated similarly to banks but claimed that a quantitative assessment should complement a qualitative assessment of insurance companies. He also stated that “ComFrame does not have to endorse Solvency II or any specific national regulatory framework” in order to move forwards.

McRaith ended by saying that the FIO welcomed insurers’ perspective and input as it expands its engagement and resources. In particular, he encouraged insurers to participate actively as U.S. policy is developed on these insurance matters. He also wished to allay fears of potential conflicts between regulatory frameworks, where a firm could be designated a G-SIFI in the U.S. but not in Europe. “The FIO serves on FSOC (the Financial Stability Oversight Council). There is a tremendous openness to move forward responsibly just as at the IAIS, and the FIO is working to align FSOC and IAIS timing, processes, criteria and methodologies.”

Nikolaus von Bomhard, Chairman of The Geneva Association and Chairman of the Board of Management at Munich Re, asked whether it was possible that “given the consequences and in today’s environment, no company will be designated a SIFI?” “Many things are possible,” responded McRaith. “Definitely at the national and international levels,

participants are intent on being factual and on developing a process that is not ideological, in order to avoid designating a firm [as a SIFI] that, on its merits, does not deserve it."

Von Bomhard then highlighted the potential difficulty for regulators not to designate a single firm a SIFI in the current economic climate. "I'll have that courage," said McRaith. "Our chore is to educate people in differentiating banking and insurance, and explaining the particular reasons behind AIG's collapse. If we are able to do that, it will be easier to judge institutions on their merits."

"Our chore is to educate people in differentiating banking and insurance. If we are able to do that, it will be easier to judge institutions on their merits."

Finally McRaith returned to the issue of equivalence in regulatory regimes, stating that it was too important for the EU and the U.S. to engage in a process whereby one party unilaterally determines the professionalism of institutions in other jurisdictions. "We must evaluate best practices. Solvency II has excellent procedures that we can consider to move towards a point of convergence. But there are other areas where we won't," said McRaith.

He added that people should not get hung up on words. "What has been framed as 'equivalence' might be labelled something else. We do need to be cooperative to avoid two incompatible regulatory regimes and insurers should not be worried about that."

Patrick Liedtke, Managing Director and outgoing Secretary General of The Geneva Association, pointed out that "while the original philosophy behind the methodology as expressed in the IAIS's November 2011 paper is sound, the implementation is neither fully in line with that approach nor would it be effective in identifying the sources of systemic risk. The implementation proposal makes no clear distinction between systemically risky and non-systemically risky activities and a number of indicators do not respond properly to decreasing risk as they increase the G-SIFI score rather than reduce it." He asked what could be done about this situation. McRaith responded by encouraging everyone present to submit to the IAIS their comments on the assessment methodology which is currently under review.

"Four guiding principles of supervision"

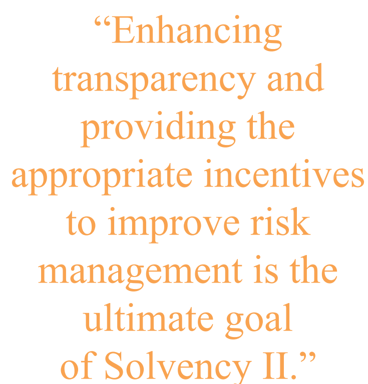
Gabriel Bernardino, Chairman, EIOPA

The European Insurance and Occupational Pensions Authority (EIOPA) was set up with the key objective of protecting policyholders, pension scheme members and beneficiaries, and the expectation of taking a leading role in promoting transparency, simplicity and fairness in the market for consumer financial products or services. "The role of regulation is not to set the price of risk or abolish risk but to set the framework for risk to be managed better," said EIOPA Chairman Gabriel Bernardino to top insurance CEOs at The Geneva Association General Assembly in Washington D.C.

Bernardino added, "This is the goal of Solvency II and there is one sound guiding principle: more risk should imply more capital." According to Bernardino, the tools are already available to apply Solvency II in the event of a crisis with regards to capital requirements and extended

recovery times. He also highlighted the need for anti-cyclical application behaviour to be better prepared to resist a crisis.

Touching upon the issue of equivalence in regulatory regimes, Bernardino agreed that common solutions must be found and that definitions need to be outlined but a flexible approach is preferable. He urged the insurance industry to trust EIOPA to make the right decisions. "EIOPA started to foster ties with regulators from such countries as Bermuda, Switzerland and Japan,for which a full equivalence assessment is already performed, and is now working closely with eight further countries. EIOPA is committed to find convergence, enhance business possibilities, avoid duplication and provide efficient regulation," said Bernardino. He added, however, that "convergence does not mean harmonisation."



Though certain activities such as non-insurance businesses must be considered to lead to systemic risk, according to Bernardino, "this assessment might change over time depending on changes in insurance models and innovation," citing maturity transformations or greater leverage as examples.

In the latter part of his speech, Bernardino set forth four fundamental principles that should guide supervision: sustainability, affordability, simplicity and transparency. Sustainability implies growth, but not at any cost. Affordability refers to EIOPA's objective to keep additional reporting and controlling efforts to a minimum, such as avoiding the unnecessary duplication of activities.

As regards simplicity, Bernardino highlighted the fact that while the insurance industry necessarily innovates and creates new solutions to pressing challenges, consumers demand products that they can easily comprehend. "Enhancing transparency and providing the appropriate incentives to improve risk management is the ultimate goal of Solvency II," Bernardino summarised.

Following the presentation, Henri de Castries, Chairman of the Management Board and CEO, AXA Group, expressed his appreciation for EIOPA's approach to supervision but also questioned whether it was reaching its goals, expressing his doubts that Solvency II itself was "sustainable, transparent, affordable and simple". He pointed out that there has been no significant failure of any insurer in Europe throughout the crisis and that pragmatism should prevail, and asked whether Solvency II will create a capital problem.

In response, Bernardino said that the system must address current volatility issues and that Solvency II as it stands today is much more transparent than it was before. He admitted that it was perhaps not very simple but recalled that Solvency II was at its inception an initiative of the insurance industry. He expressed once again his belief that Solvency II will strike the right balance between affordability and security. He also repeated that it was the insurers' responsibility, however, to design more simple and affordable products.

Ageing and Health

The challenge of global ageing

Global ageing and its impact on the financing of retirement represents one of the greatest societal and economic challenges of the 21st century. On the occasion of its 39th General Assembly, The Geneva Association presented its recent work on the topic, The Geneva Report No. 6, *Addressing the Challenge of Global Ageing—Funding Issues and Insurance Solutions*, at the National Press Club in Washington, D.C.

Fuelled by falling birth rates and increased longevity, the demographic challenge is not a recent one—though it is becoming an increasingly urgent one. The implications appear well recognised in the insurance community, with a number of executives considering old age income security as one of the most serious insurance risks over the next years.

The Association has been studying the phenomenon of global ageing for many years through its Health and Ageing programme, as well as its Life and Pensions or "Four Pillars" programme, which celebrates this year its 25th anniversary.

This programme argues that, in addition to state social security, stakeholder or employment pensions and private savings—known in Europe respectively as Pillars I, II and III—members of older generations make a valid economic and social contribution to the functioning of our service economies through a flexible extension of their working life.

The programme further advocates the consolidation of the sources of pension financing by encouraging the complementary development of the second and third pillars, and more generally the modernisation of social security through greater integration of private insurance.

"Insurance, through its expertise in underwriting, pricing and management of longevity risks, offers comprehensive solutions to address those risks," said Dr Nikolaus von Bomhard, Chairman of the Board, Munich Re, and Chairman of The Geneva Association. "It can and does make a significant contribution to the economic challenges of ageing populations."

The demographic challenge is reshaping the economic and social landscape of the 21st century. According to Richard Jackson, Director and Senior Fellow, Global Aging Initiative, Center for Strategic and International Studies, the share of elderly will grow from 15 per cent of the population in developed countries to an average of 25 per cent by the middle of the century, with other regions such as Brazil, Indonesia and China following closely. In Japan, the share will even reach 40 per cent.

The challenge of longevity and retirement funding is exacerbated by a depressed economic environment, with high unemployment in Europe, low interest rates and high market volatility globally and inadequate savings rate in most developed countries. "Graying means paying—more for pensions, more for medical services, and more for long-term care," said Jackson.

While developing countries are facing rising fiscal burdens of government benefit programmes, in emerging markets the challenge is "to guarantee a measure of security to the old that does not now exist without at the same time placing a large new burden on the young," said Jackson. "These challenges are taking place in a context of almost certain future slower economic growth and in a more risk-averse business climate and social mood."

Indeed, population ageing and the resulting slowdown in workforce growth—impacting GDP growth, savings and investments, entrepreneurship and economic performance—could contribute to the prospect of enduring economic stagnation. Solutions will require that governments, employers and individuals change their current behaviours and norms, according to John Strangfeld, Chairman and CEO of U.S.-based Prudential Financial Inc. and Vice-Chairman of The Geneva Association.

"Addressing the impact of the rapidly aging world population will require a comprehensive, broad based response from both the public and private sectors," said Strangfeld, referring to solutions that include raising the retirement age of government-sponsored pension plans, relying on risk-transfer techniques, developing a new generation of insurance products appropriate for retirees, and educating the public on the risks involved.

"The insurance industry, with its risk management and investment expertise, particularly in the areas of longevity and investment risk, is uniquely suited to play a key role in meeting the changing needs of aging populations," said Strangfeld. "It is also required by the regulatory framework to maintain adequate capital reserves to meet long-term obligations."

In an example of corporations transferring their longevity risk to the insurance sector, in this case through a group annuity contract, the *Financial Times* reported in early June that Prudential Financial agreed to take on "as much as $26bn of pension liabilities from General Motors, for the assets backing the plan and cash payments that could total $3.5bn. The deal reduces the US carmaker's pension liabilities by about a fifth."

John Strangfeld feels that this will be a growing trend in the U.S. He said that pension issues are increasingly overshadowing operating results of American companies. There are also additional funding requirements and considered changes in the accounting standards. Finally, these pension liabilities concern current retirees not future pensioners… All of these factors contribute to firms reassessing their pension situation, and how they can responsibly address the needs of the corporation and its pensioners.

"The principal risks associated with these types of funds are actuarial and investment risks, and those type of risks are much better suited to a financial institution than they are to a car company—by their own admission," said John Strangfeld. "We think it's the shape of things to come."

From left to right: *Patrick M. Liedtke, former Secretary General of The Geneva Association; Nikolaus von Bomhard, Chairman, The Geneva Association and Chairman of the Board of Management, Munich Re; John Strangfeld, Vice-Chairman, The Geneva Association and Chairman and CEO, Prudential Financial Inc.; Richard Jackson, Director, Global Aging Initiative, CSIS.*

Funding issues and insurance solutions

by Patrick M. Liedtke
former Secretary General of
The Geneva Association
and co-editor of
The Geneva Reports No. 6,
Addressing the Challenge of Global Ageing—Funding Issues and Insurance Solutions

Funding longer lives is becoming increasingly difficult under current schemes, with the sustainability of public and corporate pension schemes at risk. Responsibility for retirement funding is shifting to individuals who are not best equipped to assess and manage such longevity. Against this backdrop, insurers can devise and implement innovative solutions, and make a meaningful contribution to old-age security.

The first state pension scheme was created by Otto von Bismarck in 1889 to support "those who are disabled from work by age and invalidity". But while the retirement age was 65, this was at the time almost 30 years higher than the average life expectancy at birth in Germany: 35.6 years for men, 38.4 for women.

On this basis, with life expectancy having progressed more dynamically over the past 100 years than at any time in human history, the retirement age in most of Western Europe should be well above 90 years. Even if we had only tried to keep the average duration of pension payments constant over the past four decades, the retirement age today would be into the 70s. This is all a far cry from where we stand in today's discussions about rather modest rises in the statutory retirement age in many countries.

After World War II, pension schemes become ever more generous whilst dependency ratios, i.e. number of people of working age to number of those not in the labour force (children and pensioners), remained relatively static. As the baby boom receded and boomers approached retirement age, the dependency ratio dropped to roughly 3.5. In the current environment of increasing life expectancy and low fertility rates, it is therefore becoming more and more difficult to finance retirement.

Governments worldwide suffer from high sovereign debt and individuals are forced to shoulder more retirement risk and yet they are often not the best able to understand and manage that risk. The insurance industry is in a unique position to form part of the solution to these challenges with its expertise in underwriting, pricing and management of longevity risks, offers comprehensive solutions to address those risks and a meaningful contribution to old-age security. It also has the skills and experience to design innovative products specifically catering to those who opt to work beyond the formal retirement age.

The Geneva Reports N° 6, *Addressing the Challenge of Global Ageing—Funding Issues and Insurance Solutions*, takes an in-depth look at the issue from various perspectives, notably in Chapter 1, "How demography is reshaping the economic and social landscape of the 21st century" (Jackson) and Chapter 2, "Global ageing: root causes and implications for key stakeholders" (Courbage and Liedtke).

What should be done?

Chapter 5 of the report, "Funding for old age: an overview and comparative analysis of the solutions" (Parsons), provides a detailed picture of the broad spectrum of insurance solutions designed to manage the retirement planning and financing responsibility. Given that the aim of retirement planning is usually the securing of a predictable income throughout retirement, he cites the following risks that insurance can manage:

- the risk of outliving retirement income;

- the risk of value loss due to premature death;
- the risk of having no access to money in the event of a hardship;
- the risk of inflation eroding the value of retirement income; and,
- the risk that investments will decrease in value at the very time they need to be sold.

To tackle these challenges, several solutions are available to individuals. Converting retirement savings into a regular income stream for life via life annuity benefits is one of the more popular, which mitigates the risk of outliving retirement income. These products come in several forms, such as joint life annuities, certain and contingent annuities, or annuities with return of premium, which provide benefits to survivors of the policyholder in the event of premature death.

Retirement income insurance protects individuals against sudden misfortune that could drastically reduce available income in retirement. Inflation-linked annuities protect policyholders against the real-income eroding effect of inflation. And variable annuities with living benefits limit the impact of poor investment performance.

Chapter 7 by Greg Becker of RGA also looks at the insurance industry's role in addressing longevity funding issues, whilst Chapter 3 by Milka Kirova of SwissRe, reviews the funding and risk transfer mechanisms of insurance and how it has and can contribute to old-age protection. Chapter 9 by Kai-Uwe Schanz, Special Advisor to The Geneva Association and co-editor of the report, looks at how key stakeholders in the global ageing debate—governments, employers, individuals and households, and (re) insurers—have specific and coordinated roles to play in sustainably tackling old-age security and funding issues. Finally, Chapter 11 by the IMF looks at the general challenge of public pension reform in advanced economies.

Recommendations for governments

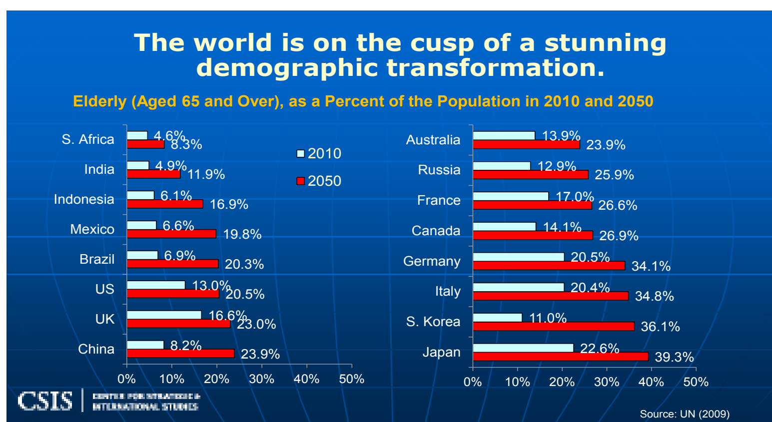
Our experts agree that if no corrective action is taken, the cost of state pensions as a share of developed countries' GDP will double from about 8 per cent now to approximately 15 per cent by 2050. Add public expenditure on health and figure could go up to 24 per cent by 2050. Pension reform is a prerequisite to long-term fiscal stability.

While governments cannot—and probably should not—be expected to cover fully the financial cost of retirement systems, they can and should provide a long-term planning and financial stability framework that will support a constructive societal resolution of the problem. Therefore, what should governments contemplate in order to maximise their contribution to addressing the old-age challenge?

Because longevity is one of the root causes of chronological population ageing and contributes to the challenge of financing old age, raising the retirement age is a highly plausible solution, particularly in developed countries when people reach old age in better health and with higher education. It is also possible to consider eliminating incentives for early retirement; the main objective of these policies was to improve youth employment, but this is an empirically proven fallacy as the amount of labour is not fixed. Indeed, it would be worthwhile to offer incentives for part-time work beyond the official retirement age. To do so, governments

should encourage change in attitudes and help retirement be perceived as a gradual process.

In this regard, The Geneva Association has been promoting a "Four Pillars" approach to old-age financing for 25 years through its Life and Pensions Programme. This involves harnessing the first three pillars consisting of government-sponsored pay-as-you-go systems, occupational schemes and individual savings, and allowing labour-market participation beyond retirement age as a fourth pillar. Chapter 8 of the report by Krzysztof Ostaszewski (Head of the GA's Life and Pensions Research Programme and Editor of *The Four Pillars Newsletter*) provides a holistic view of how and why all pillars need to work in concert.



Source: United Nations (2009), presented by Richard Jackson, Director, Global Aging Initiative, Center for Strategic International Studies (CSIS).

Governments can also provide a conducive institutional framework for increased private sector participation, increase labour force participation, encourage higher fertility and facilitate immigration. Finally, they can reduce pension benefits via a variety of methods, Italy for example, which increased the number of contribution years needed for entitlement. Directly increasing pension contribution rates and taxes, however, appears to be increasingly unsustainable and further increases could threaten to stifle economic activity.

Recommendations for employers

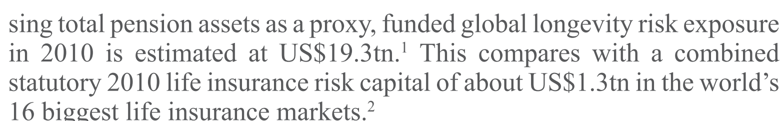
Employers must first and foremost review their risk-bearing capacity and consider in particular risk transfer/insurance options for the continuation of Defined Benefit schemes. Another, increasingly popular solution is buying longevity insurance cover from an reinsurer, as demonstrated by Swiss Re's recent £1.4bn cover for AzkoNobel's U.K. pension funds.

In addition, employers should explore ways to implement tailored solutions for individual employees, make retirement and pension issues a cornerstone of employee communication, and capture the potential of "silver workers" by providing opportunities for employees reaching the statutory retirement age to pursue employment under more flexible conditions.

Recommendations for insurers

Longevity risk presents the life insurance industry with massive opportunities: each year of increased life expectancy adds trillions of dollars to governments' and employers' retirement liabilities but also provides often unexplored production capacity. Biometric risk being a core business of life insurers, the industry clearly has the expertise, skills, data and diversification power (the natural offset between longevity and mortality exposures) to address longevity risk.

Life insurers already offer well-proven longevity indemnity products such as individual annuities. However, the exposure at hand is gigantic:



sing total pension assets as a proxy, funded global longevity risk exposure in 2010 is estimated at US$19.3tn.[1] This compares with a combined statutory 2010 life insurance risk capital of about US$1.3tn in the world's 16 biggest life insurance markets.[2]

Against this backdrop, one has to remain realistic as to the global insurance industry's capacity to take longevity risk onto its balance sheet. For this reason, it is important to support the development of innovative risk mitigation solutions and the direct involvement of capital markets. The key focus of the industry should be to optimise product pricing and design, rethink existing business models and, importantly, contribute to educating the public on the cost of longevity.

Recommendations for individuals

Individuals need to accept responsibility for their retirement. They should understand the importance of pursuing a multi-pillar approach, in particular saving more (Pillar III), and realise that though the perceived cost of insurance (particularly at a younger age) is high, not being insured is ultimately the more expensive solution.

The average replacement rate (retirement pension as a share of earnings while working) in the OECD is close to 60 per cent. Some countries, e.g. the U.K., significantly fall short of this average. At half of the OECD average, Britons would have to save 7 per cent of their income to close the gap, i.e. to reach the OECD average.[3] Once this has been achieved, individuals must then mitigate the risk of outliving savings.

Conclusion

It is evident that a comprehensive strategy involving all stakeholders is required to solve the problem of old-age financing. This strategy must take a holistic and strategic perspective of the challenges we are trying to address, be it financial stability or the securing of retirement, and it must ensure that operational or knee-jerk reactions to specific problems do not needlessly interfere with potential solutions to the macro-challenges.

The issues of financial stability reform, the rules and regulation of accounting and the reform of solvency laws are in this regard of particular concern. For example, the recent announcement of the proposed inclusion of variable annuities without any discrimination as to particular types of annuity products (which are very different from each other) as a systemically risky activity could impede an area of the insurance business that has real benefit for individuals and a role to play in addressing funding retirement. There is a need for such products and there is no evidence that in their regular forms they create systemic risks.

How we go forward with regulation and supervision of the many aspects that influence directly or indirectly old-age security solutions is critical to achieving long-term success. We need to pay special attention to the many complex interconnections and correlations. Anything short of an enlightened multi-dimensional approach will fail.

1 OECD (2011) *Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries*. Paris: OECD Publishing.

2 Swiss Re (2011) *World insurance in 2010. Premiums back to growth—capital increases*, *sigma* No. 2. Zurich: Swiss Re.

3 OECD (2011), *op. cit.*

Longevity and pandemics

by Denis Kessler,
Chairman and CEO, SCOR

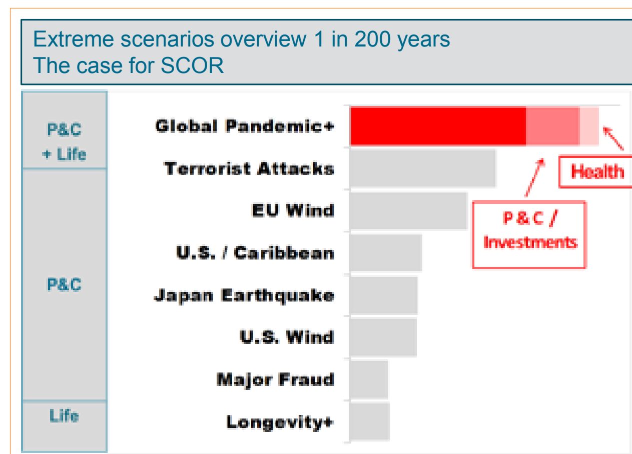
Chairman of the breakout session on Longevity and Pandemics

Pandemics are events with a low probability of occurrence but with a very high potential for loss. They therefore represent a major tail-risk for insurers and reinsurers.

New outbreaks are almost certain to take place in the coming decades, though it is near-impossible to predict when they will take place or how severe they might be since they depend on chance events in evolution.

Sir Roy Anderson of the Imperial College, London, stated to Members of The Geneva Association at the 39th General Assembly in Washington, D.C., that this greater probability of pandemic occurrence is due to a confluence of factors, in particular "an increasingly globally mixed society with rapid and frequent air travel", and "increased population growth and the associated growth in domestic animals living in close proximity."

Life (re)insurers are particularly affected, as well as P&C lines of businesses for which pandemic risk can be as or even more severe than other major risks—including natural catastrophes. There have been 11 outbreaks in the past 300 years and five major influenza pandemics recorded in the past 120 years totalling about 80 million deaths according to estimations by scientists and historians. Pandemic risk factors are subject to lively ongoing scientific debates regarding their spread patterns and their possible origins: viruses or bacteria acquired from animals, mutations of viral or bacterial genomes?



Source: SCOR.

> "Pandemic risk can be as or even more severe than other major risks—including natural catastrophes."

Mitigation measures are also subject to debate; they include minimising morbidity and mortality, buying time while a vaccine is developed, minimising duration of the epidemic and its impact on the economy, and minimising peak prevalence below a defined level to avoid a collapse of health care systems. One has to be aware, however, of potential conflicts between policy options aimed at minimising the duration of an epidemic and those seeking to reduce its peak, since very often attempts to "squash" the peak tends to lengthen the duration of the outbreak, according to Prof. Anderson.

Large-scale computational models in analysing the spread and control of infectious diseases now exist to provide scenario analysis tools used to support the policymaking process and test the effectiveness of specific strategies and mitigation or containment plans, according to Alessandro

Vespignani of Northeastern University in Boston, also a panellist for the breakout session at the General Assembly. "Mathematical models have become important tools and current research ranges from the analysis of stylised models, which provide basic insights into epidemiological theory, to computational approaches for large-scale simulations able to gauge the actual threat of diseases with pandemic potential."

Pandemic and longevity risks for insureds and insurers

In normal times, infectious disease death rates are dramatically lower for the insured population. Based on lessons learned from the 1918 Spanish influenza, this would appear to remain true in the case of pandemics if one correlates better health with greater wealth and/or insurance coverage: "A 10 per cent increase in per-head income was associated with a 9-10 per cent decrease in mortality," writes Prof Christopher Murray of the Harvard Public School of Health, while Edgar Sydenstricker of the U.S. Public Health Service declared that "the lower the economic level the higher was the (disease) attack rate even after allowances had been made for the influence of color, sex, age and certain other conditions." Indeed, age is another filter, along with income and access to treatment, that limits the exposure of insureds, mortality being generally lower in higher age brackets.

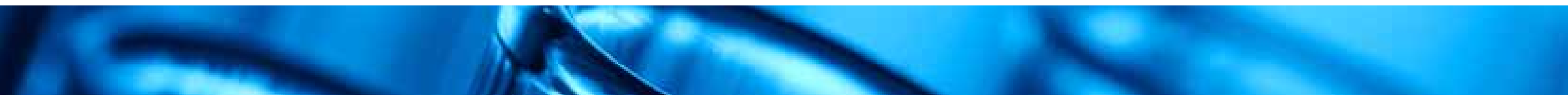
Insurers and reinsurers can limit their own exposure to pandemics by taking several mitigation measures, such as maintaining the risk under their risk limits and/or transferring the risk through stop-loss tail coverage, CAT bonds, mortality swaps or non-recourse embedded value (EV) securitisation.

"Longevity risk seems easier to assess and manage than pandemic risk—but do we have a sufficiently clear picture?"

Another measure for insurers to limit their exposure is to hedge the risk with the longevity business. Indeed the longevity risk insurance market is growing rapidly, particularly in the U.K. This is due to several factors, among which demographic changes, new regulatory requirements (Solvency II and the calculation of the SCR Life Underwriting Risk, and International Financial Rerporting Standards-IFRS), and the low profitability earned on assets.

Indeed, longevity risk does seem easier to assess and manage than pandemic risk—but do we have a sufficiently clear picture? Do we have sufficient knowledge of the determinants of longevity to be able to predict accurately enough its future changes and correctly price the longevity risk (policies underwritten today are intended to run for several decades)? Is the increase in life expectancy the same within a population? Is there a physiological limit to the increase in lifespan seen in recent years?

Another issue is the correlation between the longevity of pensioners and the mortality of the working population: what are the consequences in

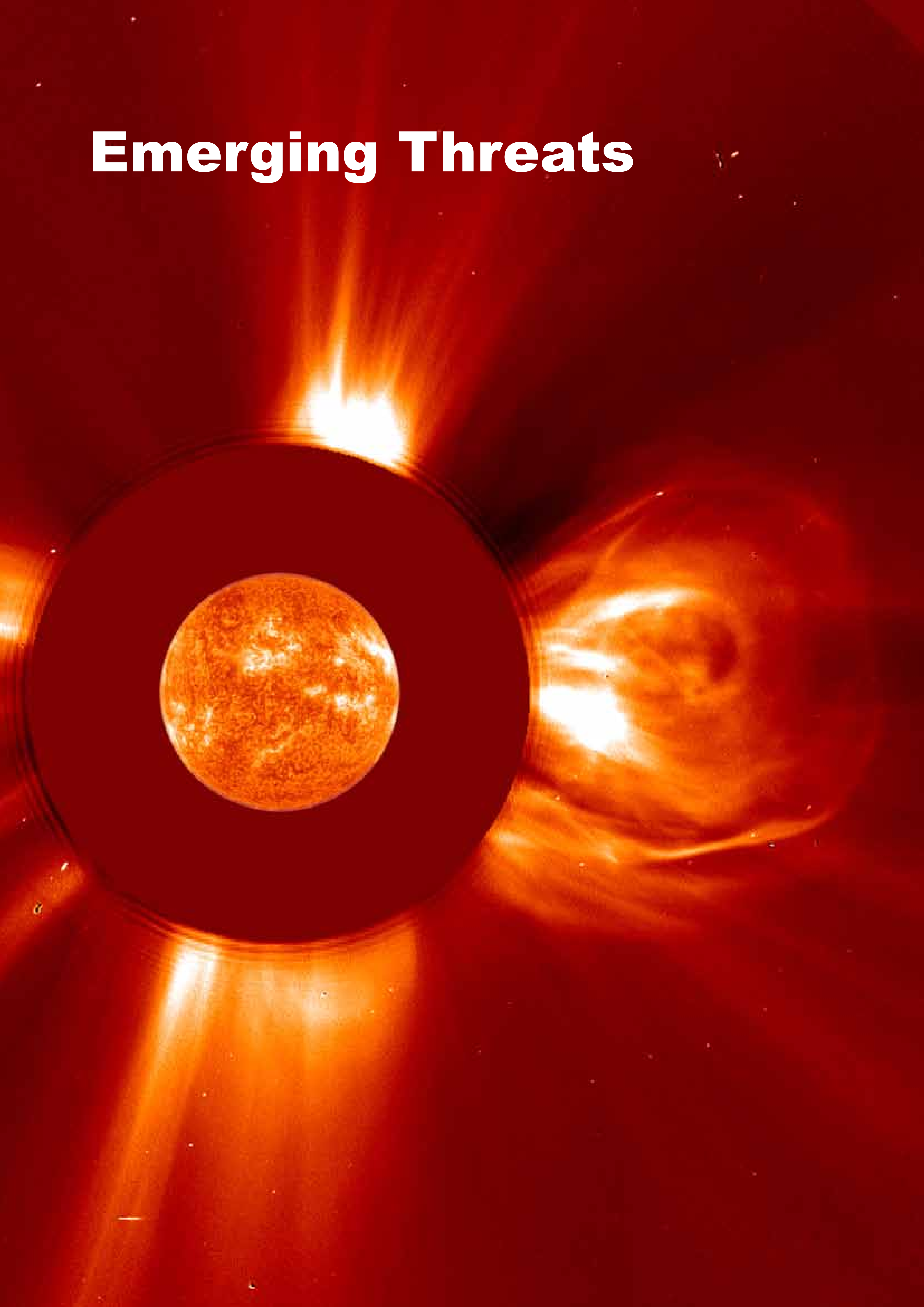


terms of capital for (re)insurers? There are two major trends affecting longevity risk. Firstly, there is a "compression" of mortality curves, i.e. a given proportion of deaths is taking place in a shorter age interval than before, and secondly life expectancy continues to increase worldwide, with an explosion in the numbers of centenarians (in Japan, the multiplication factor is by four every ten years, twice as much as in other developed countries).

"The occurrence of new pandemics in the coming decades is a certainty, though it is near-impossible to predict when they will take place or how severe they might be."

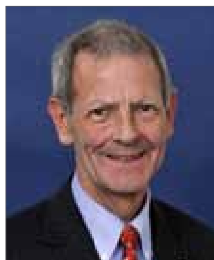
To conclude, pandemic diseases represent a serious risk for which (re)insurers must be prepared and in which insurance can play a role in terms of mitigation. "Analytical and statistical methods are available today to help assess pandemic impact and the potential consequences of various interventions" says Sir Anderson. "Mathematical models provide a sophisticated quantitative framework to evaluate risk and to facilitate policy formulation. They cannot, however, predict either the timing of emergence or the nature of a novel infectious agent."

Breakout session 2 on "Longevity and Pandemics" at The Geneva Association 39th General Assembly in Washington, D.C.



Emerging Threats

Climate Risk and The Principles for Sustainable Insurance (PSI)



by Walter R. Stahel
Vice Secretary General and Head of Risk Management
The Geneva Association

In the light of the United Nations' Principles for Sustainable Insurance, Members of The Geneva Association were faced with the decision to sign the Principles or not—and if so, when.

In June 2012, the United Nations Environment Programme Finance Initiative (UNEP FI) officially launched the Principles for Sustainable Insurance (PSI) in connection with Rio+20, the 20th anniversary of the UN Framework Convention on Climate Change at the Earth Summit 1992, at the International Insurance Society (IIS) annual meeting.

The PSI are the latest step of the United Nations to create incentives for economic actors to accept a voluntary responsibility beyond their traditional activity. The historic analysis shows a trend towards a radicalisation of the thinking behind the UN outreach process, but also a fight for dominance within the UN system. This radicalisation can therefore be expected to continue, with liability questions on Environmental, Social and Governance (ESG) issues continuously gaining importance.

PSI are unique in two ways:

- they only aim at insurance companies, and
- they incorporate all issues and business lines of insurance, from underwriting to claims management to investment and corporate strategy.

PSI are based on a series of research studies conducted by UNEP FI in 2006-2009 on risks and opportunities in the insurance business associated with ESG issues. PSI state that "no definitive list of ESG issues exists, but they typically are issues that have traditionally been considered non-financial or not material, with a medium or long-term horizon."

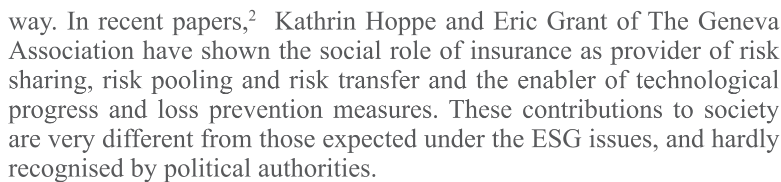
Twenty years after the Earth Summit at Rio, UNEP FI "remains the United Nations' only dedicated partnership with the financial sector".[1] UNEP FI has thus become the spearhead on pushing ESG issues with the financial sector, with a focus on social and governance issues.

Over the decades between The Stockholm Conference, Agenda 21, The Statement of Commitment and the PSI, three evolutions have occurred.

1. Governments, for the most part, have made little and uneven progress in implementing the laws and policies outlined for them in Agenda 21 (witness the Kyoto Protocol).
2. The United Nations have expanded the scope and mission of the private sector from engaging in private-sector partnerships to protect the environment to engaging in broader partnerships and giving equal weight to economic, social and governance issues.
3. Governments' little and uneven action in implementing Agenda 21's principles has led to UNEP engaging in supra-national agreement with the private industry in order to achieve sovereign goals.

The UN Economic and Social Council (ECOSOC) has traditionally been the tool to achieve a balanced development. The PSI tilts this balance by naming non-governmental organisations (NGOs) and intergovernmental organisations (IGOs) as stakeholders and giving them rights to fight inequalities—which are important issues but in a detached singular

1 UNEP FI Position paper on Rio+20, *who we are*.



way. In recent papers,[2] Kathrin Hoppe and Eric Grant of The Geneva Association have shown the social role of insurance as provider of risk sharing, risk pooling and risk transfer and the enabler of technological progress and loss prevention measures. These contributions to society are very different from those expected under the ESG issues, and hardly recognised by political authorities.

The failure of the Rio+20 conference in July 2012 has underlined the failure of the political system of world governance and increased the competition for leadership within the UN System:

- ECOSOC has since proposed an annual 1 per cent tax on the fortunes of all billionaires worldwide.
- The member governments have decided at Rio+20 to create a UN Sustainability Conference to coordinate the economic, social and environmental issues.
- UNFCCC (UN Framework Convention on Climate Change) has now shifted its focus from the science of climate change including mitigation and adaptation to fund rising—how to finance the climate change needs of the third world.

The focus on money—the UN Global Green Fund (the only tangible result of COP 17 in Cancun) is already asking for US$ 100 billion annually to be paid by the private sector—is becoming more apparent after Rio+20. Even if the final version of the PSI is intended to be "voluntary and aspirational", the earlier version clearly had stated a mandatory membership with no clause to opt out. As such, signing—or not signing—the PSI imply important operational, reputational and legal considerations.

"Insurance plays an early warning role in many areas where risk management is paramount (...). In this sense, insurance can be a strong lever of ESG."

The PSI: a statement

At Discussion Session A at The Geneva Association General Assembly, Randolph Evans, Partner at McKenna Long & Aldridge LLP, drew the audience's attention to the PSI wording—each of the four principles begin with "we will…"—and said that the commitment must be taken seriously. "It goes to the heart of the business, including corporate strategy," he said. He also stressed that while investors' questions and interest in ESG issues grow, there is no absolute definition of ESG, which varies between vision and reality, and in this case lies in the hands of NGOs and IGOs, not in the hands of the signatories and the PSI board.

Signing the PSI is a statement—but so is not signing them. Either decision opens pressure points from investors and social groups. There are also competitive issues—a UN-sponsored project can offer marketing advantages—as well as negative ones. The UN is not particularly well perceived in the U.S., for instance, and so far no U.S. insurer has supported it. Yet "ticking the box" shows an insurer's commitment, while waiting can project the image of being "behind the curve". Whatever the final decision is, Evans advised Members to take it as soon as possible—and make sure they have a record as to why they made it.

2 K. Hoppe, "The Value of Insurance to Society", *Risk Management Newsletter* No 51, May 2012, and *The Social and Economic Value of Insurance,* The Geneva Association, 2012.

A voluntary framework

Insurance plays an early warning role in many areas where risk management is paramount, such as weather mitigation and health prevention. In this sense, insurance can be a strong lever of ESG, according to Anthony Kuszinki, President and CEO of Munich Re America. For this reason, insurers should abide by the “aspirational, inclusive and voluntary” aspects of the UNEP FI framework, i.e. companies should sign because they want to—not because of external pressure.

Kuszinki added that the core group that has drafted the PSI is committed and very powerful, and that the PSI is “simply the next step after Global Compact and PRI (Principles for Responsible Investment)”. He told Members to consider that the PSI are perhaps what they should be doing anyway. Good intentions can lead to bad places, however, and insurers could ultimately be accused of “enabling bad practices.” The issue of compliance must also be resolved.

A good investment

Mark Fulton, Global Head of Climate Change at Deutsche Bank, believes that insurance is the ideal sector to profit from the PSI, and that the initiative is a step forward since the PRI in 2005: PSI (liability) and PRI (assets) overlap on the path to socially responsible investment, according to Fulton, who suggested that the impact on equities will be stronger than on bonds.

Fulton believes that the best companies are ahead with regards to investment in ESG and that a lot of the push is employee-driven. Sustainability is common sense—insurers, however, must be aware that returns may only be in the longer term, particularly with regard to new special products that are being designed.

Academic studies tend to show that ESG-based investments produce higher investing returns, and Fulton believes that they will produce superior risk-adjusted returns. “PSI will become common practice, because companies following ESG issues as a result have a cheaper cost of capital and a higher ROE,” he said.

Source: Deutsche Bank, presented by Mark Fulton, Global Head of Climate Change, Deutsche Bank.

Nevertheless, as often stressed by several Member CEOs, each insurer must take a careful look at the implications of the PSI for his company. Randolph Evans offered several steps that can be taken to determine the best path forward.

In summary, “The PSI are a milestone in the continued evolution of the relevance of environmental, social and governance issues in business, including in the insurance

industry. If implemented by many in the industry, the PSI, along with other sustainability initiatives, could help influence and shape how environmental, social and governance issues are considered in the future and how the industry and stakeholders work together toward the common goal of 'sustainability'. In this journey, the legal, operational, and reputational implications should not be ignored."

From left to right: *Walter Stahel, Vice Secretary General and Head of Risk Management, The Geneva Association; Michael Butt, Chairman, AXIS; Randolph Evans, Partner, McKenna Long & Aldridge UP.*

The history behind PSI

The United Nations Economic and Social Council (ECOSOC) was founded on 23 January 1946; its concern are the world's economic, social and environmental challenges. Under a 1946 UN Charter, the Council is the place where such issues are discussed and debated, and policy recommendations issued. ECOSOC has broad responsibility for some 70 per cent of the human and financial resources of the entire UN system, including specialised agencies, "functional" commissions and five regional commissions.

In 1963, the United Nations Research Institute for Social Development (UNRISD) was established as an autonomous space within the UN system for the conduct of policy-relevant, cutting-edge research on social development, within the broader goals of the UN system of reducing poverty and inequality, advancing well-being and rights, and creating more democratic and just societies.

In 1965, The United Nations Development Programme (UNDP) was established as the United Nations' global development network. It advocates for change and connects countries to knowledge, experience and resources to help people build a better life. Additionally, the UNDP works internationally to help countries achieve the Millennium Development Goals (MDGs).

In 1972, The United Nations Conference on the Human Environment, held in Stockholm, was the first global environmental meeting and set a precedent for international cooperation in addressing environmental degradation: 113 UN members attended and agreed that they shared responsibility for the quality of the environment, signed a declaration of principles, known as the Stockholm Declaration and approved an environmental fund and an action plan. The representatives also established the U.N. Environment Programme (UNEP) to coordinate action, monitor research, collect and disseminate information and play an ongoing role in international negotiations about environmental issues.

In 1992, 179 UN members gathered in Rio de Janeiro, Brazil at the Earth Summit meeting to focus on some of the most critical global issues society faced and continues to face: environmental preservation and inequality. They adopted Agenda 21, an extensive action agenda outlining how countries can ensure sustainable development globally, nationally, and locally, taking on board the definition of the Brundtland Report (*Our Common Future*, 1985) "Sustainability is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs". Agenda 21 identifies governments as responsible for ensuring that the world develops sustainably in a way that is compatible with environmental protection.

UNEP's mandate was now defined to encourage economic growth that is congruent with the protection of the environment. UNEP believed that the private sector could valuably contribute to protecting the environment while maintaining the health and profitability of their businesses.[3] At the Earth Summit, the concept for the UNEP Financial Institutions Initiative on the Environment was launched along with a statement by banks on the environment and a bank initiative.

In 1995, UNEP launched a voluntary statement, the UNEP Statement of Environmental Commitment by the Insurance Industry with a group of insurance and reinsurance companies.[4] This was followed by the establishment of the Insurance Industry Initiative (III) which funded research activities and sponsored awareness meetings, workshops and the annual regular meetings of the Initiative.

3 *http://www.unepfi.org/about/background/index.html*

4 These companies included General Accident, Gerling Global Re, National Provident, Storebrand, Sumitomo Marine, & Fire, Swiss Re, and some pension funds.

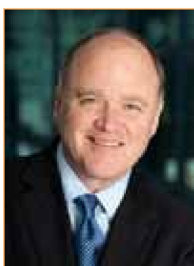
In 1997, the bank and insurance statements merged to become The UNEP Finance Initiative (UNEP FI). The Statement of Commitment is voluntary and acknowledges the principles of sustainable development outlined in Agenda 21 and the Brundtland Report. Signatories pledged to aim at "achieving a balance of economic development, the welfare of people and a sound environment."[5]

A unnoticed shift from the economic, social and environmental (ESE) objectives of Agenda 21 to environmental, social and governance (ESG) issues then took place at the end of the 1990s within the UN system: "Governance" replaced Economics, the market. This shift became first manifest in July 2000, at the foundation of the UN Global Compact (UNGC), a United Nations initiative to encourage businesses worldwide to adopt sustainable and socially responsible policies and to report on their implementation. The Global Compact is a principle-based framework for businesses, stating ten principles in the areas of human rights, labour, the environment and anti-corruption. Under the Global Compact, companies are brought together with UN agencies, labour groups and civil society.

In 2005, the United Nations Secretary-General, in coordination with UNEP FI and UNGC, invited a group of the world's largest institutional investors to join a process in developing the Principles of Responsible Investment. PRI are based on the notion that ESG issues, such as climate change and human rights, can affect the performance of investment portfolios and should therefore be considered alongside more traditional financial factors if investors are to properly fulfil their fiduciary duty. The six principles provide a global framework for mainstream investors to consider these ESG issues.

5 *http://www.unepfi.org/about/background/index.html*

Cyber attacks and IT security



by Mike McGavick,
CEO, XL Group plc.

Co-chairman of the discussion session on Cyber Attacks

Cyber insurance incorporates a wide number of risk products under different names, in particular Internet insurance and privacy insurance. The former originated around 1998 with the emergence of businesses conducting commerce over the Internet and the resulting uninsured exposures.

At the time, the primary concerns were covered business interruption and associated costs due to hacking, and extortion (the threat by a hacker of publishing personal information). With the passing of California SB 1386 in 2002 and the subsequent adoption of similar data breach notification laws by 48 states and various other U.S. and international data regulations (i.e. HIPAA, Gramm-Leach Bliley and the EU Data Protection Framework) new wordings emerged that covered first party breach notification, defence of a regulatory action and loss of personal information.

According to Matthew Norris, Hiscox Partner and Head TMT, and panellist at The Geneva Association General Assembly's third Discussion Session, "there have been few reported losses to older covers while the loss history of more recent privacy covers is characterised by a few very large losses. A few high-profile data breaches have resulted in primary and excess layers being paid."

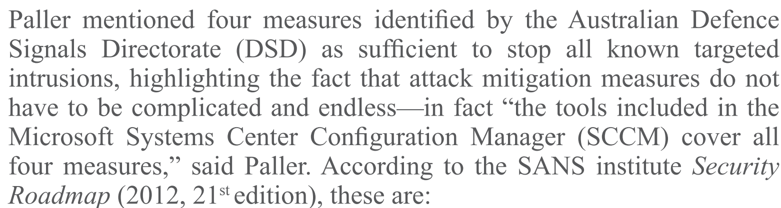
Cyber attacks today are far more pernicious and potentially devastating than before. Norris cites "Russian Doll" worms as an example: "If apparently non-malicious code is downloaded, this results in more non-malicious code being downloaded, etc., until six sets of code later, a malicious code is released. Many of these attacks are zero-day exploits—attacks that take place between the vulnerability being known and the fix being created." Cyber attacks have also evolved in terms of motivation and hackers today are often sophisticated professionals working for organised crime or foreign nation states.

"Social engineering uses human fallibility to bypass security. Skills are more important than tools: you can't buy protection; people are your protection."

Reasons for attacks, methods and lines of defence

The reasons for these breaches are manifold. Panellist Alan Paller, Director of Research at the SANS institute listed several: extortion, in particular with regards to personal health information, intellectual property theft for military and economic missions, terrorism, data theft, malware implanting, phishing or social engineering, application control and stealing, and taking control of kinetic weapons such as when Israeli forces took over the Syrian radar system in the recent conflict, annulling the Syrian defence system.

Social engineering generally uses embedded technology to achieve its aims, such as activating Bluetooth technology on cell phones to listen in on private conversations and acquire information that allows hackers to spoof emails and implant malware that will copy confidential data. The recent Flame malware, discovered on 28 May 2012, imitated Microsoft authentication software, spread over local networks or via USB stick and activated Bluetooth or took over computer webcams to record audio, screenshots, keyboard activity and network traffic. It also has the ability to analyse data (such as nuclear technology) and use it against government or industrial/commercial sites.



Paller mentioned four measures identified by the Australian Defence Signals Directorate (DSD) as sufficient to stop all known targeted intrusions, highlighting the fact that attack mitigation measures do not have to be complicated and endless—in fact "the tools included in the Microsoft Systems Center Configuration Manager (SCCM) cover all four measures," said Paller. According to the SANS institute *Security Roadmap* (2012, 21st edition), these are:

1. Patch all applications (PDF viewer, Flash Player, Microsoft Office, Java,...) and use latest version of applications.
2. Patch operating system vulnerabilities and use the latest operating system version.
3. Minimise the number of users with domain or local administrative privileges and have such users employ a separate, unprivileged account for email and web browsing.
4. Use application whitelistings[1] to help prevent malicious software and other unapproved programmes from running, e.g. Microsoft Software Restriction Policies or AppLocker.

Paller went on to say that "skills are more important than tools: you can't buy protection; people are your protection." Panellist Patrick Arnold, General Manager of Cyber Security at Microsoft Corporation, concurred that security is often foremost an issue of awareness and personnel than hardware and software. He listed as effective techniques to resist aggression: separating out who has access to what; implementing a rigorous in-house development cycle; and prioritisation. "Social engineering uses human fallibility to bypass security—have strong passwords!"

"The industry has experienced a low loss history in cyber attacks but there is the potential for an accumulation of law suits in a short period of time."

Richard Ward, CEO, Lloyd's and co-Chairman of the panel, emphasised the growth of cyber threats in terms of frequency as well as impact. Recent victims of cyber/hacking attacks include Citibank, Googlemail, IMF, Lockheed Martin, Sony and LinkedIn. Many governments now indentify cyber attacks as one of the major threats to national security, indeed the U.K. ranks cyber risk in the top tier.

Despite this trend and a growing cyber insurance market, most traditional insurance policies do not generally cover cyber risk, according to Ward. The market, however, is growing and is expected to do so, particularly in Europe with new proposed EU legislation. There are therefore emerging challenges for insurers, among which Ward cites potential aggregation, lack of data to quantify and price risks accurately.

Business opportunities and risks for insurance

Pointing to zero-day hacking exploits, Matthew Norris further asks whether there is a way for an insurance underwriting process to predict and asses adequately such a rapidly changing and sophisticated risk as cyber threat. He also questions whether the rapid, almost aggressive growth of cyber risk underwriting is due to soft casualty insurance market conditions. In particular he highlights the need to assess whether

1 "Whitelisting: accepting only applications and behaviors that are on the approved list and denying everything else." (SANS, 2009: *Application Whitelisting: Enhancing Host Security*, A SANS Whitepaper, October)

the market is striking the right balance between the growth opportunity and the risks of new harsh laws.

Class action suits other than the illegal distribution of medical records have not gained any traction, particularly in the case of credit card fraud, because there is no bodily or emotional harm. There is, however, the potential for the accumulation of law suits in a short period of time. The advent of cloud computing is also a concern, since a security breach in such an environment could trigger multiple claims.

“Though the perils for safe underwriting exist and more formal risk models need to be developed, there are certainly opportunities for creative product innovation.”

Notwithstanding covered losses to Heartland Payment Systems, Global Payments, TJX, SAIC and others, the industry has recognised a favourable loss experience. A shift in the judiciary position on class certification, the enactment of even stricter privacy laws with provisions for statutory damages and increased regulatory enforcement coupled with ever expanding carrier wordings and expanded coverage could drive a rapid increase in claims.

Another area of concern for insurance companies underwriting cyber risks is indemnity weaknesses. Policies should be reviewed, particularly old policies that exclude theft or deletion but not data copying, which is the norm today. Sony, for instance, recently tried to establish whether there was cover under their Comprehensive General Liability (CGL) policies after they experienced a data breach. “Are there privacy exposures being picked up unexpectedly in Errors & Omissions, CGL or Property lines of business?”

Additionally, potential aggregation exposure, if a cluster of businesses insured by the same carrier are all relying on the same third party vendor for anything from hosting to managing email marketing and the vendor sustains a breach, presents a concern as an insured may incur multiple losses to various claims from the same event. To mitigate the exposure, insurers need to underwrite to the quality of the vendors and review any possible contract indemnification the insured may have. Recent examples that illustrate this exposure are the breaches by Amazon Web Services and Epsilon.

There is also a significant cyber terrorism threat to critical infrastructure. For example, the inherent weaknesses in computer systems that monitor and control industrial, infrastructure, or facility-based processes cause significant problems for utilities (often referred to as SCADA—Supervisory Control and Data Acquisition). Citing Norris, “Process control software was a target of the extremely sophisticated and probably state-sponsored Stuxnet worm used to attack Iranian nuclear facilities. Such hacks could lead to property damage, bodily injury and pollution. Who should underwrite this risk?”

Though the perils for safe underwriting exist and more formal risk models need to be developed, there are certainly opportunities for creative product innovation. Insurance can attempt to reduce risks through pricing signals, such as refusing to cover cyber risks if companies don’t take minimum security measures, in particular the four major ones outlined above. The difficulty resides in the lack of security standards, however top companies often find that their security departments work together, effectively creating cross-company standards.

Cyber risk management

"Businesses are becoming reliant on technology to run their operations and services and while this brings obvious benefits, it also means companies are increasingly vulnerable to systems failures, data losses and cyber attacks," said Richard Ward, CEO of Lloyd's and Chairman of the discussion session on cyber risks at The Geneva Association's 2012 General Assembly. "Trends towards more social networking, the growth of cloud computing and varying (and often lagging) national regulations will only add to this complexity."

Ward referred to a report produced by Lloyd's in 2010, *Managing digital risks: trends, issues and implications for business*, which identifies a number of major areas of digital risk for business, including:

- Operational risks: the risks of loss resulting from inadequate or failed processes, people and systems, or from external events. These risks will lead to impacts such as loss of service to customers, loss of data, loss of the internal network, or disruption to supply chains.
- Financial risks: financial losses may result from the inability to operate business processes, as well as from fraud and theft.
- Intellectual property risks: the loss of product plans, marketing plans or critical intellectual property to competitors can seriously damage a company's ability to compete.
- Legal and regulatory risks: if an organisation is shown to be in breach of its regulatory requirements, it could ultimately face sanctions or a fine.
- Reputational risks: public visibility of incidents can cause harm to company's image, brand and reputation. In extreme cases, security incidents may cause shareholders to lose confidence in a company and will potentially affect its share price.

Left to right: *Richard Ward, CEO, Lloyd's; Alan Paller, Director of Research, SAWS Institute; Matthew Norris, Hiscox Partner and Head of TMZ.*

The Lloyd's digital risk report highlights a number of ways businesses can begin to address cyber risks. It suggests that cyber risk needs to become a Board-level concern. Risk managers need to establish ways of regularly monitoring cyber risks and providing an informed view to their companies. In particular, Boards need to be made aware of cyber risks and regularly updated on new developments and trends.

The report also recommended that risk managers need to develop comprehensive digital risk management strategies that involve a range of mitigations, as well as risk transfer solutions. Risk managers need to prioritise which of the many IT security options available will best mitigate risk for their company. They also need to consider how to best use technology standards, guidelines and research into digital risks to help manage cyber threats. In order to effectively manage cyber risk, businesses should consider transferring some of these risks to third parties through insurance solutions. While many traditional insurance policies do not cover or mention digital risk, there are a growing number of cyber risk products and solutions becoming available.

Space weather and its impact

by Richard Ward,
CEO, Lloyd's

Chairman of the breakout session on Space Weather

A Lloyd's report published in 2010 highlighted that space weather could potentially affect major global systems and create huge disturbances in the transport, aviation and power sectors. Because space weather affects major global systems, a very severe event could even present a systemic risk.

Space weather describes events that occur in near-Earth space and can disrupt modern technologies on Earth. Like weather on Earth, space weather comes in different forms and different strengths. The most commonly recognised form of space weather is probably solar storms. These eruptions on the sun "produce streams or clouds of plasma that travel out into space and, if directed our way, affect the Earth's environment," explained Dr David Boteler of the Geological Survey of Canada to participants at the breakout session on space weather during the 39th General Assembly of The Geneva Association.

Space weather is governed by a typically 11-year solar cycle that allows us to predict, at some level, when effects are likely to be most frequent. At the maximum of the solar cycle, violent events are common on the sun, although they can occur at any time. The next "solar maximum" period is next likely to take place between 2013 and 2014, "which means an elevated geomagnetic storm risk from 2012-2017, peaking in early 2015," according to a 2012 report by Atmospheric and Environmental Research Inc.

When those events eject solar matter and energy—known as "coronal mass ejection"—towards Earth they produce space weather phenomena, such as intense magnetic and radiation storms. Boteler provided an overview of how the plasma produced by solar flares interacts with Earth's magnetic field, increasing electron levels in radiation belts that affect satellites, and ion levels at the top of the atmosphere that affect radio communications. Solar flares also cause intense electric currents via Earth's magnetic field that induce electric currents in long conductors such as pipelines and power transmission lines.

"A power outage affecting densely populated regions and lasting several weeks would have widespread, catastrophic impacts through the economy and society."

These geomagnetically induced currents (GIC) flow to the ground through transformers at substations connected to the lines, "producing partial saturation of the transformer core, changing the operating conditions of the transformers," said Boteler. "Increased power consumption by the transformers can cause voltage dips and system stability problems leading, in extreme cases, to power blackouts."

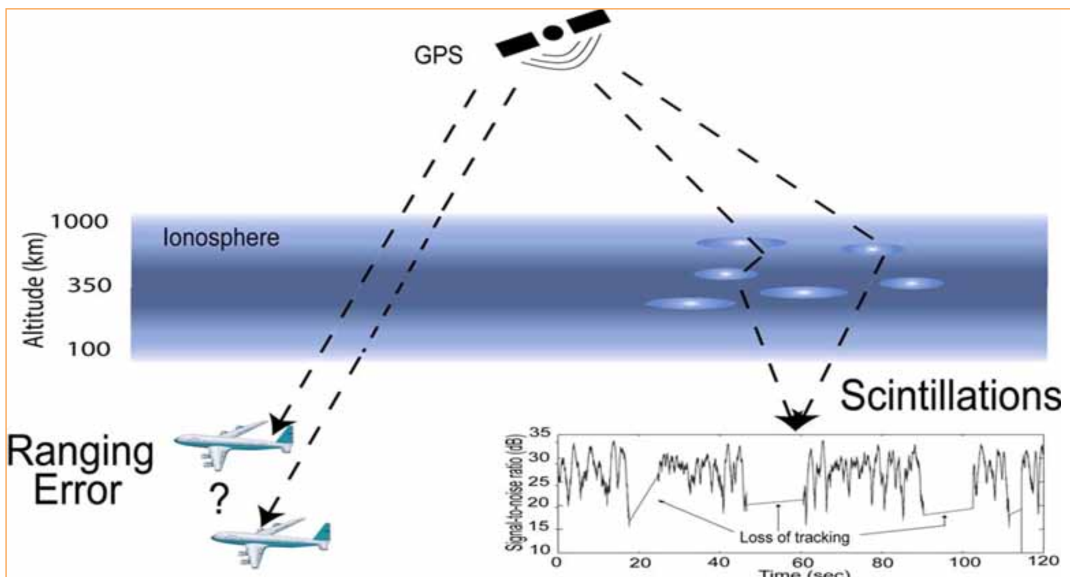
An intense magnetic storm in September 1859 disrupted telegraph services worldwide. Since then, the growth of technology has left society even more at risk from space weather. Indeed, as we become ever more reliant on modern digital technologies and as systems become more interconnected, a major space weather event like the 1859 storm in the next few years could seriously disrupt unprepared businesses and society as a whole.

Vulnerable sectors and industries—the potential for systemic risk

A Lloyd's report published in 2010 highlighted that space weather could potentially affect major global systems and create huge disturbances in the transport, aviation and power sectors. Because space weather affects major global systems, a very severe event could even present a systemic

risk. For example, a loss of power could lead to a cascade of operational failures that would leave society and the global economy severely disabled.

Electrical power systems and grids are particularly vulnerable to space weather. Space weather also has a major impact on aviation, primarily because it interferes with navigation. Indeed, all GPS systems are vulnerable to space weather. "Shortwave radio communication depends on ionospheric conditions and ionospheric disturbances can result in complete loss of communications," explained Boteler. "Satellites are directly affected by the charged particles in the space environment, causing false commands and damage to satellite electronics."



Source: Geological Survey of Canada, presented by David Boteler.

Established in September 2011, a Solar Storms Working Group (WG) made up of Allianz, Lloyd's, Munich Re, Swiss Re and Zurich, and organised under the auspices of the Emerging Risk Initiative of the Chief Risk Officers' Forum, has reviewed existing scientific knowledge of solar storms and their effect on power supply systems, and issued the following statement, as presented by Eberhard Faust, Munich Re's Head of Research (Climate Risks and Natural Hazards), during the breakout session:

> *Extended power outages in urban areas, which might consequently be without water and food for long periods, could have unforeseeable societal and economic consequences. Operators of high-risk technologies such as nuclear power plants are particularly dependent on the reliability of the power supply system. We are convinced that a power outage affecting densely populated regions and lasting several weeks would have widespread, catastrophic impacts through the economy and society.*

"Technological options to strengthen the resilience of bulk power supply systems are available that can reduce the risk for the overall economy and for society."

> “There could be a business opportunity to extend insurance to cover threats from moderate space weather events to assets and services based on earth.”

Measuring and forecasting space weather events

Current research shows that the average occurrence interval of an extreme storm is 50-100 years, according to panellist Dr Nicole Homeier, astrophysicist at Atmospheric and Environmental Research Inc. in Lexington, Massachusetts. Homeier cited recent studies by Love and Riley (2012) estimating a 6-12 per cent chance of an occurrence in a 10-year time period.

Events such as the 1989 solar storm that knocked out power supply systems in Quebec, Canada for nine hours are expected to occur every 50 years, said Faust, adding that “At present, only some grid operators are prepared for events of a magnitude comparable to the 1989 event.” The 1859 super solar storm witnessed worldwide, also named “the Carrington Event” after the astronomer who observed and recorded it, is considered to occur with a frequency of less than once in a century. Such a super storm would have a catastrophic impact if it happened today.

The size and orientation of a plasma cloud is measured by satellite, specifically the Advanced Composition Explorer (ACE), the Solar and Heliospheric Observatory (SOHO) and the Global Geospace Science (GGS) WIND satellites. Measurement can only be taken, however, if the plasma cloud passes the satellites, and these are located at a position of gravitational balance point located one-tenth of the distance between the Earth and the Sun.

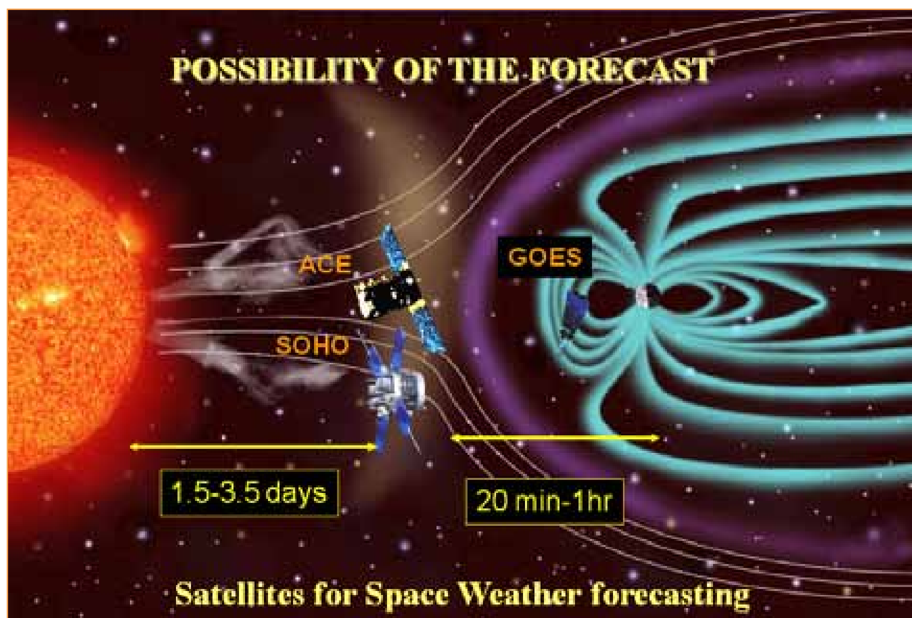
Being so relatively far from the Sun, the forecast can only be made 20-60 minutes (depending on solar wind speed) before the cloud reaches the Earth. “Obtaining continuous monitoring at locations closer to the Sun

From left to right: *Eberhard Faust, Head of Research, Climate Risk and Natural Hazard, Munich Re; David Boteler, Geological Survey of Canada; Richard Ward, CEO, Lloyd’s; Nicole Homeier, Atmospheric and Environmental Research Inc.*

will require a constellation of spacecraft in solar orbit: something that is not going to happen any time soon," said Boteler in concluding his presentation.

Insurance implications

It is likely that the risks of space weather impacts will already be covered to some extent under existing insurance policies, such as property and business interruption, as space weather will not specifically have been excluded. Insurers therefore need to consider potential accumulations of exposures to the risks posed by large solar events. As the understanding of space weather impacts on business expands, so will the business opportunities to provide risk management solutions, including insurance against the risks posed by those impacts.



Source: Geological Survey of Canada, presented by David Boteler.

Geomagnetic currents would particularly impact lines of business covered by property, liability, credit and marine insurance (property damage, business interruption, Director's and Officer's liability where obvious prevention measures were not taken, insolvency issues, harbours at a standstill,etc.). Radiation from solar storms could impact space and aviation insurance by causing damage to satellite solar panels and electronics, the malfunctioning of steering onboard computers, a loss of communication between aircraft and control towers, inhibiting polar routes, and exposing airline crew and passengers to higher levels of radiation.

The insurance industry has considerable experience of insuring space assets and includes the risks from space weather when pricing these assets. There could be a business opportunity to extend insurance to cover threats from moderate space weather events to assets and services

based on Earth. In terms of the severe threats that attract most media attention, it is likely that these could create such widespread disruption that governments would need to get involved. There may be opportunities for insurance, therefore, but these probably need to operate within a wider strategy set by government.

Indeed, the insurance sector can support joint efforts by governments, regulatory authorities, scientific experts, electricity generators and distributors, and other industries, to mitigate the risk associated with extreme space weather events. One of the difficulties in initiating such efforts resides in the fact that the impact of solar storms is not as immediately perceptible as, for instance, the consequences of an earthquake, flood or hurricane. Homeier also highlighted the controversy that existed over the potential severity of space weather events. "If the severity of these storms is not accepted as a problem, mitigation will not be enacted," she said.

"Because of this non-perceptual character of the hazard and technological vulnerability," Faust concluded, "controversial issues and even various different industry and policy interests might evolve and hamper the initiative for risk mitigation." Against this background, the initiative will be most convincing if not only individual insurers but rather a group of leading worldwide insurers is promoting risk mitigation exigency.

Photo Gallery

Opening night at the Newseum on Pennsylvania Avenue.

John Strangfeld, CEO Prudential Financial and Vice Chairman, The Geneva Association (left); Nikolaus von Bomhard, Chairman of the Board, Munich Re, and Chairman, The Geneva Association (right).

Mike McGavick, CEO, XL Group plc. (left); Liam McGee, Chairman, President and CEO, The Hartford (right).

From front to back: *Patrick M. Liedtke, former Secretary General, The Geneva Association; Yoshihiro Kawai, Secretary General, IAFS; Jan H. Holsboer, Honorary President The Geneva Association; Donald A. Guloien, President and CEO, Manulife Financial Corporation..*

From left to right: *Ignacio Eyries, CEO, Caser Group; Jan H. Holsboer, Honorary President, The Geneva Association; John H. Fitzpatrick, Secretary General, The Geneva Association.*

Masaaki Nagamura, Deputy General Manager, Tokio Marine & Nichido Fire Insurance Company Ltd (left); Walter R. Stahel, Vice Secretary General and Head of Risk Management, The Geneva Association (right).

John Strangfeld, Chairman and CEO, Prudential Financial Inc. and Vice Chairman, The Geneva Association (left); Patrick M. Liedtke, former Secretary General, The Geneva Association (right).

Statutory Assembly of The Geneva Association, 7 June 2012, Washington D.C.

Obituaries

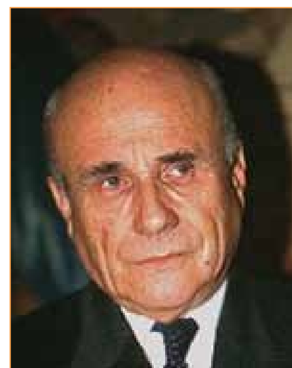
Farewell to Geneva Association founder, Fabio Padoa-Schioppa, and to former Member and preeminent banker Antoine Bernheim

The Geneva Association, bids farewell to two prominent men who made an invaluable contribution to the creation and development of the Association.

Fabio Padoa-Schioppa was born in Naples on 7 January 1911 and is best known as Managing Director of Assicurazioni Generali SpA from 1968 to 1976, and Vice-Chairman from 1970 to 1977. As early as 1971, Fabio Padoa-Schioppa and other CEOs of major insurance companies discussed founding an insurance institute, recognising the growing importance of risk management and insurance in ensuring a viable global economy. Padoa-Schioppa became a Member of The Geneva Association at its creation in 1973 and succeeded former French Prime Minister Raymond Barre as President of the Association from 1975 to 1983. He remained a Member until 1996, working tirelessly to further the research and consolidate the activities of the Association in the realm of insurance economics.

Fabio Padoa-Schioppa

Born in Paris on 4 September 1924, Antoine Bernheim guided the second stage of development in the life of The Geneva Association, as Board Member from 1997 to 1999 and from 2002 to 2010. His invaluable networking and business skills supported the rapid development of the Association during this period. Thanks to Antoine Bernheim's strategic leadership and close work with Board Members, the Association increased its involvement in global discussion on issues of insurance and risk management, and began interfacing more effectively with the industry. He also contributed to the Association's research, such as the article on "Challenges in Insurance Markets", published in *The Geneva Papers on Risk and Insurance—Issues and Practice*, The Geneva Association's flagship publication.



Antoine Bernheim

Fabio Padoa-Schioppa and Antoine Bernheim both led extraordinary lives, leaving an indelible mark on the field of insurance and largely helping to shape The Geneva Association as a leading insurance economics think tank.

Fabio Padoa-Schioppa studied law in Milano before starting work in insurance in Vienna. He interrupted his career several years later to study—and teach—philosophy in Florence. He then returned to the insurance industry, moving to Trieste in 1949. In addition to his positions at Generali, Fabio Padoa-Schioppa was former President of the Comité Européen des Assurances (CEA) and councillor of the Italian National Council for Economy and Labour (CNEL). He lived his final years in Milan after retirement and died on 18 August 2012. In early 2011, The Geneva Association celebrated his century, namely through a Tribute written by Orio Giarini, former Secretary General, "The Century of a Gentleman."

Antoine Bernheim hails from a renowned Jewish family of businessmen active in the financial and industrial sectors. He started his career at Bourjois, a family business owned by distant relatives, the Wertheimers. He was named Associate of the French bank Lazard Frères et Co. from

1967 to 1999, and then moved on to becoming Chairman of Assicurazioni Generali SpA for over 12 years. He was also Vice-Chairman of a number of large French companies, including LVMH and Bolloré, and shaped the careers of a number of successful French businessmen, including Bernard Arnault, Chairman and CEO of LVMH, and Francois Pinault, Chairman of PPR. Antoine Bernheim counselled former French President Nicolas Sarkozy, and was granted the Grand-Croix de la Légion d'honneur, France's highest honour, in October 2007. He died on 5 June 2012 in Paris.

This review is a retrospective on some of the key discussions at The Geneva Association's 39th annual General Assembly in Washington D.C. Comprising essays by CEOs, Chief Regulators and leading commentators it is intended to provide an insight into the General Assembly, the most prestigious gathering of insurance CEOs worldwide, and some of the strategic issues discussed by the insurance leadership. Subjects include financial stability in insurance, climate risks, developments in liability and law, demographics, as well as opportunities open to the industry.

The Geneva Association is the leading international insurance think tank for strategically important insurance and risk management issues. Its members are the CEOs of the world's 90 leading insurers and reinsurers.

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