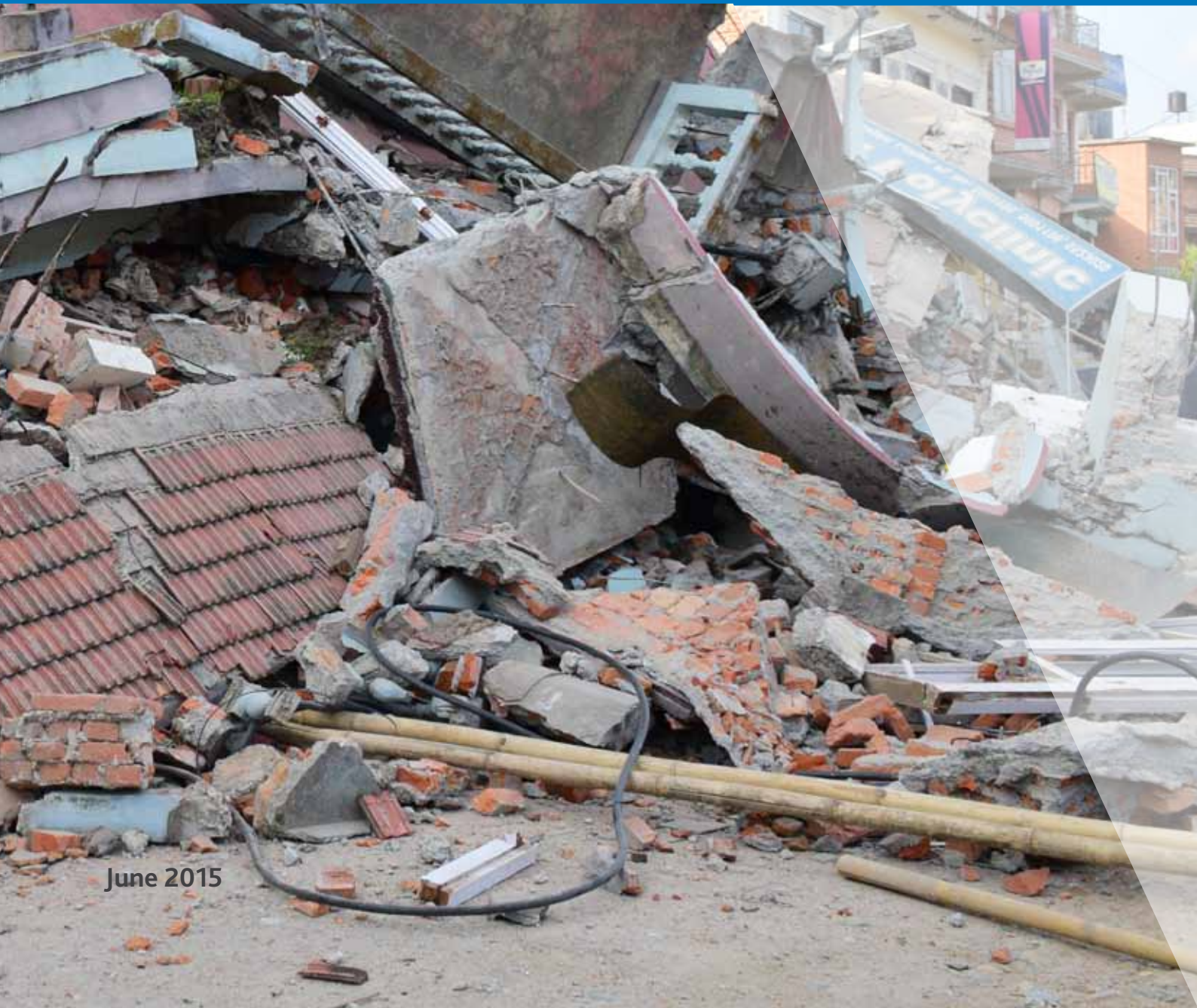


Insurance as contributors to problem solving and impact reduction

A GENEVA ASSOCIATION CONFERENCE REVIEW



June 2015

The Geneva Association

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

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

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

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

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FOREWORD

Anna Maria D’Hulster

Secretary General, The Geneva Association.



As the Hyogo Framework for Action 2005-2015 reaches its conclusion, the UN World Conference on Disaster Risk Reduction (UNWCDRR) was established to develop and adopt a post-2015 framework for disaster risk reduction. It is one of a series of important UN meetings that will take place in 2015 aiming to develop a global agreement on adapting to and mitigating the impacts of climate change. These meetings culminate in December 2015 in Paris at the 21st Conference of the Parties to the United Nations Framework on Climate Change in Paris.

While it is clear that insurance plays a fundamental role in enhancing societal and economic resilience to disasters, the industry faces two key barriers to increasing its contribution to national and international disaster risk reduction efforts. Firstly, the social and economic role that insurance plays in mitigating the disaster effects is not well recognised or understood by governments. Secondly, the value of insurance as an *ex ante* tool to increase societal and economic resilience to disasters impact and as a risk signalling tool is also poorly understood and hence badly under-utilised.

In order to address these issues at the most important international disaster risk reduction event since 2005, The Geneva Association hosted a conference on Insurance as Contributors to Problem Solving and Impact Reduction as a side-event of the UNWCDRR in Sendai, Japan on 16 March 2015.

Together with global experts from academia, the risk management industry and members of governmental and non-governmental organisations we gained a better insight on these barriers through discussing three fundamental questions:

1. How can the insurance industry’s wealth of knowledge better serve societal resilience?
2. How can the insurance industry navigate community actors to behave risk consciously? And,
3. How can the insurance mechanism be better utilised as an effective social system to enhance disaster risk reduction?

These questions were tackled by a set of panels comprising some of the world’s leading experts in disaster and risk management and the essence of their respective contributions is provided within this conference review.

The Geneva Association’s Extreme Events and Climate Risks programme is a leading industry forum for discussion about, and advocate of, insurance and risk management solutions to disaster impact reduction and climate risks. As such The Geneva Association will continue to be engaged in these global discussions on behalf of our distinguished membership and the wider insurance industry, throughout 2015 and beyond.

Finally, I would like to extend our sincerest thanks to Shuzo Sumi, Chairman of the Board of Tokio Marine and co-Chair of our Climate Risks and Extreme Events Working Group and his team for acting as local host and sponsor of this meeting.

WELCOME

Shuzo Sumi

Co-Chairman and session host of The Geneva Association's Extreme Events and Climate Risk working group.
Chairman of the Board, Tokio Marine & Nichido Fire Insurance Co., Ltd.



I am very pleased that The Geneva Association has been given an opportunity to contribute to the global debate at this 3rd United Nations World Conference on Disaster Risk Reduction. This is not the first time that The Geneva Association has held a public forum on the topic. Eighteen months ago, we convened in Sendai to discuss the events of 11 March 2011 and learned a lot from Tohoku University scholars about the devastating consequences of the East Japan earthquake and tsunami.

The Members of The Geneva Association and Extreme Events and Climate Risk (EE+CR) working group shared their thoughts on the event and the role that insurance can play to make the world safer. My own memory of 11 March remains vivid. I can clearly recollect the moment when the shock was felt in my office in downtown Tokyo and the actions that followed. We took all possible measures to provide relief to the local residents who were suffering hardship. More than 90 per cent of reported claims were settled within 90 days of the occurrence.

The way that insurers handled claims and worked in the community following the Tohoku earthquake and tsunami changed perceptions of insurance in Japan. Indeed, insurance was among the first forms of financial relief to reach the disaster-stricken region, paying approximately USD 12 billion to more than 780,000 household owners. The Earthquake Reinsurance scheme proved effective. The programme is a government-backed system and is a living example of how the public and private sectors can work together and respond quickly to post-disaster recovery.

The insurance industry's experience and risk evaluation skills may help refine emergency preparedness programmes by working with national or local governments, as well as assist businesses in running risk-conscious operations. We have the potential to become a major contributor to local disaster risk reduction. Through this afternoon's programme, we hope to provoke creative thinking on how the insurance industry's knowledge can better steer the world towards risk awareness, and how the insurance mechanism can better be utilised to design disaster-resilient social systems.

In two days, we are expecting the roll out of the post-2015 framework. I am convinced that insurance will play a more significant role in mainstreaming disaster risk reduction in the design of this framework, and I am very excited to see an active and constructive debate taking place in this room.

KEYNOTE SPEECH

Margareta Wahlström

Special Representative of the United Nations Secretary-General for Disaster Risk Reduction and Head of the United Nations Office for Disaster Risk Reduction (UNISDR).



Insurance plays an important role in what we do at UNISDR, and what I hope we can explore together is how insurance can develop this role in implementing and supporting the disaster risk reduction framework for the coming decades—a role that is multifaceted and not just the classic image of the insurance industry, which suffers—as many of you have told me—from biased perceptions of unsettled claims.

The insurance industry covers a wide range of activities. It is not one homogenous body of expertise—there are risk experts to brokers to investors... We on the outside need to learn what we can expect from the different parts of the industry, and to whom we take questions and ask for contributions. Insurers have come a long way in their willingness to share data, and this must certainly continue—as must the sharing of data by the government, as exemplified in Australia after the floods and the wildfires when the government turned to the insurance industry to ask for information on what we might expect in the future, and provided the data to assist them in answering that question.

The importance of insurance to post-disaster recovery is self-evident and well documented, for individuals as well as governments. If people and communities are insured, their recovery is much faster, and in a better and more sustainable manner. Insurers, however, also contribute *ex ante* to a change in behaviour. It is important to harness the risk expertise of the industry to really influence and technically assist the public and private sectors in their assessment and management of risk.

A more complex facet of insurance than the role that it plays in protecting individuals and communities and an essential aspect that we would like to address is the instruments used to prevent and mitigate risk. We hope to develop in particular an understanding of the mechanisms that put capital at risk, and how to build risk into capital so that there is a positive and deterrent factor in how investments are being made, by both the public and private sectors.

The world is underinsured, not only in poor countries but also in wealthy countries. Hopefully the insurance industry has a greater understanding of why insurance is not used more widely as a risk transfer instrument. I think the factors are a mix of politics, social considerations, perception, personal responsibility and tradition. Perhaps one of the things we have to do together in the coming years is “unpack” this mixed bag of factors and tackle them.

In some parts of the world, governments have taken on a much larger share of the insurance burden and therefore more risk for losses. Either the private sector is taking on less risk or the overall burden has grown—but it looks like it is taking on less. This is a very peculiar development, occurring while the insurance

industry has developed. Certainly we need to address the factors contributing to underinsurance and assist the insurance industry in stepping out of its traditional mode of operation. We need in-depth information not only about what customers believe they need, but also the environment and how they react.

A success story in the contemporary effort to have the insurance industry do things that will motivate people to insure themselves in the future comes from the Philippines, with a very mobile and rapid payout of insurance claims. Indeed, as Chairman Sumi pointed out, the insurance industry is often the first to ensure payouts and provide financial relief. That is a very powerful and motivating position in which to be. It helps people understand the benefits they can receive from the insurance industry, and contributes to increasing insurance penetration. The industry is also, in this manner, more immediately involved at the community level.

The bigger issue is the accumulated risk for the future. Here the industry's risk expertise is the most important instrument it has—the understanding of the actors (insurers are among them, so they must of course look at themselves) and how to influence capital, from a short-, medium-, and long-term perspective, and encourage a positive direction, meaning reducing the accumulation of risk to the future.

This requires a multi-stakeholder approach, collaboration within the financial industry and with the regulatory authorities, and also an understanding of how the insurance mechanism is different from other sectors such as banking. It is also critical to engage in dialogue with governments, public authorities and the private sector. The insurance industry can take the first step and take the lead, so that their readiness and capacity for innovation can be truly beneficial. In the implementation of the Post-2015 Framework for Disaster Risk Reduction, the industry can help identify what is feasible and what is not feasible, and where institutions such as the UNISDR can act as intermediaries on its behalf.

INSURANCE AS CONTRIBUTOR TO RISK AWARENESS AND RISK ASSESSMENT

Peter Hoeppe

Head of Geo Risks Research/Corporate Climate Centre, Munich Re



In the event of a large natural disaster, it falls to insurers, and particularly reinsurers, to pay. In order to be able to write profitable business on a long term, it is necessary to know the risks as best as possible and, as a basis for this, collect all available loss data from natural disasters. Munich Re first flagged climate change for the insurance sector back in 1973. It has since built the world’s most comprehensive database on natural catastrophes, with over 35,000 data sets. It catalogues all loss events for the U.S. and select countries in Europe from 1970 until today, and all loss events worldwide since 1980. It also comprises retrospectively all great disasters since 1950, as well as major historical events starting in 79 A.D. with the eruption of Mount Vesuvius—3,000 historical data sets.

Since 1980, globally, there is a clear trend of increasing numbers of loss-relevant events. In our trend analyses and assessment of a potential influence by climate change, we focus on numbers of events rather than on the amount of losses, since losses are predominantly affected by a number of other factors, not the least of which is population growth. From about 300 annual weather-related events in the first half of the 1980s, the numbers have climbed to up to 900. This concerns all types events—meteorological, hydrological and climatological (storms, floods, droughts, fires).

Yet, while these types of events have increased three or even fourfold, there is hardly any change in the relative number of geophysical events such as tsunamis, earthquakes and volcanic eruptions. Therefore, the whole signal of a higher frequency of natural disasters comes from weather-related events, and this is exactly the pattern we would expect if changes in the atmosphere were responsible for changes in natural disasters. In fact, 78 per cent of all losses due to natural catastrophes between 1980 and 2014, totalling USD 4.2 trillion, are weather-related. The ratio of Insured losses is even higher, with 89 per cent due to extreme weather events and only 11 per cent due to earthquakes, tsunamis or volcanoes.

Analysis of global temperatures shows clear upward trends, with 9 of the 10 warmest years in the 135-year period of recording temperatures occurring in the 21st century. Last year was the warmest across global land and ocean surfaces, and January 2015 was the second warmest January on record. As we enter a new El Niño, there is a fair chance that 2015 will prove to be even warmer than 2014. Global warming may have taken a break in the last 10 years, as many people thought, but it is now accelerating again.

The Intergovernmental Panel on Climate Change (IPCC), which can be considered the authority in climate research, recently issued its *Fifth Assessment Report (AR5)** where it presents the potential impacts of climate change. One essential

* <http://www.ipcc.ch/report/ar5/index.shtml>

message is: more frequent and severe extreme events will increase losses and loss variability. The report mentions insurance, stating that changing loss patterns will challenge insurance systems to offer affordable coverage and provide more risk-based capital. Finally, since uncertainty regarding the nature, extent and impact of climate change will continue well into the next few decades, existing uncertainties on regional climate projections and socio-economic developments require iterative risk management.

The IPCC Working Group II also presented information on a number of regional key risks and the potential for risk reduction by adaptation. The research shows that increases of some risks can be slowed down or even reversed with proper adaptation methods—and insurance is certainly one element of adaptation.



The Munich Re NatCat database includes major historical events starting in 79AD with the eruption of Mount Vesuvius.

GLOBAL WARMING TRENDS AND CHANGES IN EXTREME WEATHER AND CLIMATE EVENTS

Masahide Kimoto

Vice Director, Professor, Atmosphere and Ocean Research Institute, University of Tokyo



The message from climate scientists is that global warming is occurring right now, and it can be imputed to human activity. Indeed, some of the changes in extreme weather and climate events observed since about 1950 have been linked to human influence. Disasters occur, of course, without global warming. But in the presence of global warming, disaster risk is changing. And global warming is expected to continue at least for the next several decades.

Research in the recent report by the Intergovernmental Panel on Climate Change (IPCC)* shows that two variables act in proportion when considering rising temperatures. The first variable is cumulative CO₂ emissions through human activity. The other is the degree of warming. Human activity has an impact on rising temperatures. The implication is that limiting climate change will require substantial and sustained reductions of greenhouse gas emissions.

Since 1850, we have already experienced one degree of warming—global surface temperature change. If we do nothing, carbon emissions will continue to rise at the current trend, and temperatures relative to 1850 will continue rising, possibly exceeding 4°C or even more. If we stabilise CO₂ emissions at current levels, the rise in temperatures will slow but continue nevertheless, since the cumulative emission continues to grow. Only if we reverse the trend and lower emissions considerably, close to zero, can we hope to see temperatures stabilise—but these will still be 2°C above 1850 levels. It is a very serious situation.

In every case, therefore, temperatures continue to rise and so does the risk of extreme events. We are very confident about temperature risk, but precipitation risk is also increasing. The size of the population vulnerable to floods is set to rise quite considerably worldwide. The number of heavy rain days and dry days since the 1900s has experienced an upward trend (quite substantial in the case of heavy rain days), while the number of light rain days has decreased. This combination of factors leads to increased flood risk.

There are two categories of disasters. The first comprises those coming in 10 to 20 years that we can foresee, and we have to prepare for these and protect ourselves through mitigation measures and insurance. The other, however, consists of the unexpected events, and those are the ones that generally constitute a disaster. The scale of a disaster is a combination of natural hazard multiplied by exposure and vulnerability. Therefore disaster risk reduction measures need to consider these three factors. Science can provide insight into the first part; insurance must be involved in reducing vulnerability. Dialogue is therefore essential.

* <http://www.ipcc.ch/report/ar5/index.shtml>

SESSION 1—HOW CAN THE INSURANCE INDUSTRY’S WEALTH OF KNOWLEDGE BETTER SERVE SOCIETAL RESILIENCE?

CATASTROPHE MODELLING—UNITING DISASTER RISK REDUCTION WITH INSURANCE

Robert Muir-Wood

Chief Research Officer, RMS.



Modelling has evolved since it first emerged in the late 1980s and early 1990s, at a time when the insurance industry was experiencing something of a crisis, uncertain how to price risk and assess the accumulation of risk with respect to natural catastrophes. Modelling certainly remains very much a work-in-progress. This is not a finished capability. It is still learning, and in years like 2011 that learning accelerates.

The modelling first sponsored by the insurance industry is now moving into the disasters community. In 5–10 years, everybody working with disasters will come into contact with models to some degree, because the disasters community has identical problems to those experienced by the catastrophe insurers in trying to work out what is the true average number of people killed or buildings lost. You can’t just measure it from what happens, because that data is too uncertain and too volatile. This is the situation which confronted the insurance industry, since they couldn’t wait for a disaster to strike before pricing a risk—insurers had to build models with a synthetic history.

Risk is real, it is out there, it is like an invisible topography, and it is the modeller’s job to try to map it. The basic premise of modelling is breaking the problem down into its constituent components and researching each: hazard, exposure, vulnerability and risk cost. When these components are brought together, one creates the “risk engine” of a catastrophe modeller. As difficult as it is to define precisely the reality of risk, it is the modeller’s task to try to gain as much knowledge of the level of risk, as well as the uncertainty in this estimation. It is impossible to take effective decisions around disaster management or around insurance unless we understand what this landscape of risk actually looks like.

The “exceedance probability” (EP) curve is a very powerful tool for viewing risk in two dimensions: those of severity and frequency. When considering action to take to reduce risk, we need to know what the change in the EP curve as a result of that action is and whether the benefit accrued (the amount of risk reduction) is worth the cost. If we build a flood defence, for example, we may reduce the flood risk above some probability of exceedance, as determined by the height of the flood defence, and make it go away. The changes in the shape of the loss EP curve enable us to calculate, in the area between the original curve and the new threshold, the savings in losses averted—which allows us to determine the savings that will be required in the cost benefit analysis for building the defence. The same set of procedures apply when considering the benefits of implementing a building code, for example. What are the benefits in losses avoided as compared with the cost of implementing the measure? These are the questions asked by the disasters community and only the tools developed for insurance pricing can really help answer them.

Another area in which modelling can be applied concerns saving lives in earthquakes. As the places where people work may have very different characteristics around their performance in earthquakes to where they live, we will need to model the expected earthquake life losses according to the time of day. In one simulation of a major earthquake in the Los Angeles area, for example, because houses are safe places, the life loss at night turns out to be only around 500 fatalities, but in the same earthquake in the day time, when people are concentrated in the more dangerous offices and industrial premises, we can expect casualties to be 10 times as high. We can explore how the level of casualties would be brought down as a result of retrofitting the most dangerous buildings, for example.

Another challenge concerns modelling expected casualties for forecastable disasters such as storm surges, tsunamis or tornados, which offer anywhere from a day's to 10 minutes' warning. A warning may provide the possibility of evacuating populations, but not everybody is going to evacuate. You can use a modelling framework to estimate how many people may be killed even in a forecastable disaster, starting with identifying the population exposed to danger if they do not evacuate, and then determining what proportion of people will move to locations of safety. We can then determine how changes in policy around issuing warnings, evacuation drills and education can contribute to reducing potential casualties.

As we focus around using models to identify what actions will have the biggest benefit in reducing disaster losses and casualties, we will need a new type of "risk reduction broker". We have insurance brokers who are incentivised to spread risk, which helps build resilience, but we want other mechanisms in place that encourage the reduction of risk as well. Insurers would be prepared to invest in risk reduction if they knew someone guaranteed to stay insuring with them—as through some multi-year insurance contract. The insurance industry employs some of these risk reduction mechanisms already, such as imposing burglar alarms and specific locks when homeowners purchase insurance to reduce the risk of break-ins. There are, of course, some risks that are not worth reducing, which we can term "irreducible risks", that are only worth insuring; but incentivising risk reduction is essential, and again modelling can help show what the benefits relative to the costs of implementation are.



[Click here to see the interview with Robert Muir-Wood at UNWCDRR 2015](#)

SESSION 1—HOW CAN THE INSURANCE INDUSTRY’S WEALTH OF KNOWLEDGE BETTER SERVE SOCIETAL RESILIENCE?

DESIGNING EFFECTIVE INSURANCE SCHEMES

Swenja Surminski

Senior Research Fellow, Grantham Research Institute on Climate Change and the Environment, London School of Economics.



The idea, when speaking about multi-stakeholder dialogue in the context of climate change adaptation, is to come to some sort of understanding of roles and responsibilities. The insurance industry has done a lot to contribute to risk information and understanding, even bringing the term “risk” and the idea of risk-based thinking into government and NGO perceptions. That has been a major achievement.

The key question now is how we can translate that knowledge and information into action—not just in terms of risk transfer, which is one aspect of the issue, but also in many other respects such as services. Here the industry has the potential to play a proactive role, particularly with regard to settling claims after an event has occurred, contributing to rebuilding efforts.

We should recognise that the insurance industry is not homogenous, however. We see and hear quite a lot from the leaders in the insurance and reinsurance sectors, and what they do obviously informs other players in the sector. But there is not enough being done to look at local capacity, in terms of new insurers emerging in those countries that lack a tradition of financial services. In many developing countries, risk transfer is only possible with strong support from government and international donors. What is being done to build local private sector capacity? This must not be overlooked.

Research has shown that insurance is still considered far too much in isolation, with an exclusive focus on the risk-transfer aspect. We need to examine how insurance can be linked to and interrelated to the other aspects of risk management. There are admittedly many issues that make this quite difficult, but it is important to look into this and that it remain at the forefront when designing insurance schemes, such as flood protection. This is far from a straight-forward process, particularly when it engages public and private stakeholders, and discussion on risk reduction and the role of insurance in incentivising risk reduction really needs to take place at the design stage, or when existing insurance schemes are being reformed.

Another key point to consider is who actually makes decisions about underlying risks. Is it the homeowner or business? Is it the government, and if so at the local or national level? Or is it one or several of the other stakeholders who are not part of that insurance value chain? This is a fundamental first assessment that needs to be made: who will actually decide if something is being built in a resilient way, in the right place. This value chain lacks consideration—insurance and the insurance customer are part of the equation, but risk management and risk reduction depend on many other stakeholders and the decisions they make. This issue of decision-making is important. In the U.K. we’ve seen the insurance industry place pressure on the government to build flood defences. Indeed, how can the insurance

industry use influence and convince decision-makers that disaster risk reduction makes sense. This is something that The Geneva Association is currently exploring, as it attempts to show that resilience measures can provide an economic growth mechanism, that it is not just a sunk cost and that there is a "resilience dividend". Insurance alone is not the "silver bullet" with regard to disaster risk reduction, and there may actually be situations where insurance doesn't make sense. It is important, however, coming back to the idea of partnerships, that we are clear where and at what level insurance can make sense and contribute—in the context of global loss and damage, all the way down to local microinsurance.

SESSION 1—HOW CAN THE INSURANCE INDUSTRY’S WEALTH OF KNOWLEDGE BETTER SERVE SOCIETAL RESILIENCE?

NATURAL HAZARDS, THE EARTHQUAKE COMMISSION AND THE NEW ZEALAND INSURANCE MARKET

Josie Vidal

Principal Advisor, Office of the Chief Executive, New Zealand Earthquake Commission.



New Zealand’s experience with extreme events over the past few years has provided the country with knowledge that can be of value to the disaster risk financing debate. New Zealand’s location on the Pacific “ring of fire” means it is prone to earthquakes, volcanic eruptions and tsunamis. Every year there are about 15,000 earthquakes, 100–150 of which are large enough to be felt. With a population of around 4.5 million people and high natural disaster risk, New Zealand has positioned itself as a viable insurance and reinsurance market, with a mixture of public and private insurance provision. The estimated losses from the Canterbury earthquakes between 2010 and 2011 reached 20 per cent of GDP. The Earthquake Commission (EQC) is a government-owned Crown entity that provides “first loss” natural disaster insurance for residential homes, as well as the land around them, which is quite unique. It was founded in 1945, so it is mature in the insurance market, and its model provides for top-up cover through voluntary private insurance, which has proven attractive to insurers. EQC cover is provided automatically with the purchase of residential fire insurance. The model also confers a degree of certainty to reinsurers, which was of great value in the recent spate of earthquakes. As a result, over 95 per cent of residential properties are insured. EQC pays up to a cap, and private insurers pay on loss above that, with a government guarantee on the scheme.

Touching upon the Canterbury earthquakes, it must be noted that these represented New Zealand’s worst natural disaster since the 1930s, with 185 lives lost, economic losses estimated at NZD 40 billion (20 per cent of GDP) and insured losses estimated at NZD 30 billion. There were 13,000 earthquakes over 15 months, constantly exposing the population of Canterbury—New Zealand’s second largest city—to often frightening tremors. There were over 750,000 insurance exposures (dwelling, contents and land claims), with the greatest extent of observed liquefaction in an urban area ever.

This put many parts of New Zealand to the test, including EQC. In insurance terms, the earthquake sequence was five times bigger than the biggest large-scale event previously planned for by EQC. It was one of the largest insurance events in global history, with three earthquakes among the ten costliest worldwide in terms of insured losses. Because of the succession of damaging earthquakes, there was a real reluctance to start rebuilding until the intensity of the aftershocks reduced. During this time, EQC switched from being a pure insurer to providing a lot of emergency repair work, as part of a wider New Zealand government response in Canterbury. Like most insurers, EQC paid cash when something happened, but the scale of the Canterbury earthquakes forced a rethink. In consultation with the government, EQC was mandated to manage home repairs that were estimated to cost less than the EQC cap of NZD 100,000. This amounted to EQC getting

directly involved in repairing 68,475 homes (currently 94.8 per cent of all repairs declared through the home-repair programme have been made).

The existence of EQC has ensured there has been adequate capital available to fund the repair or replacement of around 169,000 homes. Ninety per cent of residential homes in Canterbury sustained some form of damage, and the high level of insurance cover has enabled a high rate of repair and rebuilding, critically within controllable costs and to high quality. In addition to “managing the money”, EQC also has a mandate to build resilience through funding research to understand and reduce vulnerability to geological hazard, and public education to encourage steps to reduce the effects of geological disasters. To meet that mandate and to build resilience to natural disaster damage, EQC invests in core infrastructure to support research and hazard monitoring. EQC’s research programme aims to improve knowledge and professional practices in order to reduce the government’s exposure to geological hazard events and make communities more resilient. EQC is also the principal sponsor of GeoNet, which is New Zealand’s 24/7 geological hazard monitoring system—a network of more than 600 geophysical instruments (sensing equipment) located throughout New Zealand, integrated with software applications.

The data accumulated by GeoNet is managed and analysed by skilled personnel to improve the detection and understanding of earthquakes, volcanic unrest, land deformation, land stability, geothermal activity and tsunamis. This information is used by emergency managers, scientific researchers, engineers, lifeline utility groups, planners and the general public (via the website, social media and a smartphone application). GeoNet also provides real-time data-sharing with other major data centres in Australia, the U.S., Europe and Japan.

Scientific understanding of geological hazard risk can be used to calculate potential losses from future events for insurance and reinsurance purposes. The flow of information from GeoNet has been particularly critical in providing technical input for the rebuilding process in Canterbury. For the general public, GeoNet provides extensive on-line information (more than 1 billion hits per year, 45,000 followers on Facebook) and provides push notifications for up-to-the-minute earthquake alerts.

Finally, EQC is very focused on public education as the best way to raise awareness and present practical information to reduce the impact of natural disasters. This is done through sponsorship of events at museums, school programmes, publications and the EQC website. This has really helped people to understand the nature of risk, reduce uncertainty and improve risk management.



February 2011: signage for emergency contacts after the 6.3 magnitude earthquake in Christchurch, South Island, New Zealand.

SESSION 2—HOW CAN THE INSURANCE INDUSTRY NAVIGATE COMMUNITY ACTORS TO BEHAVE RISK CONSCIOUSLY?

THE CASE OF PIRA AND NATIONAL RE (PHILIPPINES)

Augusto Hidalgo

Trustee, PIRA Insurance Industry Association, and CEO, National Reinsurance Corporation of the Philippines.



How can we establish more open stakeholder relationships in developing nations on the topic of disaster risk reduction, and how can insurance be of help? Indeed, insurers can influence actors to be more conscious of disaster risk and, consequently, manage and potentially transfer disaster risk effectively. It is important, in this context, to understand the underlying perceptions surrounding disaster risk.

We have talked about how the world is underinsured, but perhaps we can take a different perspective by rephrasing this problem and stating that the world is largely self-insured. Some of the discussions around insurance, data, analytics, engagement and participation ought to address—certainly in the Philippine case—the awareness of what it costs to hold risk.

As you may know, in the developing world, underwriting and analytics are not well established. Many of the solutions that emerge from forums such as this one are not particularly applicable to local capacity in developing nations. For that reason, discussions with community actors in countries like the Philippines focus perhaps on analytics for risk management rather than analytics for risk transfer.

The insurance community should talk to stakeholders—regulators, policymakers, consumers—perhaps in simpler terms, and ask: how much does it cost to hold risk personally, to be essentially self-insured? This could be governments, or families who have just moved above the poverty line.

Disaster risk reduction (DRR) finance is complicated for many actors in the Philippines. It involves a myriad of public and private entities, at the international level (aid, appeals and contingency finance) and national level (stand-alone DRR and national funds, sub-national actors and service providers), financial institutions (sovereign and catastrophe bonds, private loans), development financial institutions (public-private partnerships, microinsurance, emergency recovery loans), remittances and foreign direct investment. The Philippines catastrophe pool is only one aspect of DRR finance, in the form of a public-private partnership.

Engaging with the different stakeholders as an insurance trade body and bringing the data that is accessible to us to the table is an intricate matter. Indeed, talking about quantifying earthquake and typhoon risk, and generating a statement about what that might cost and how to transfer the risk, is a far less comfortable conversation for us to have with policymakers, legislators and regulators than simple tax reduction, because tax reduction is something they know. It's a different kind of risk. The challenges we face with community actors have to do with the fact that stakeholders usually operate in silos and are generally not aware of risk transfer opportunities.

It is also important to understand—particularly when considering the response time to a disaster and mobilisation in the wake of an event—the nature of the interactions between the development agencies involved in DRR and policymakers or the private sector. To do so we must consider the perspective of the community actors: consumers, suppliers and regulators/policymakers.

With regard to consumers in developing nations, lower-income consumers, in particular, culture is as important as strategy. Buyers tend to be more fatalistic and less proactive in reducing disaster risk, leading them often to rebuild in the same at-risk locations as before. This requires a specific form of communication. Policymakers with less know-how are perhaps less confident to spearhead risk transfer solutions, and favour emergency response solutions that are more expensive because they understand them better. Again, this requires a particular form of interaction.

There are several ways insurers can help. Firstly, they can assume a thought leader role, engaging in joint research with stakeholders. Secondly they can take on a more active underwriting role, developing a turnkey cat pool solution for the government (which is currently on the table in the Philippines). And thirdly, they can advocate regulators to add “risk-informed” investments in insurer investment portfolios.



Boracay, Philippines, November 2013: building lies in ruins following Super Typhoon Haiyan.

SESSION 2—HOW CAN THE INSURANCE INDUSTRY NAVIGATE COMMUNITY ACTORS TO BEHAVE RISK CONSCIOUSLY?

INSURERS AS CONTRIBUTORS TO PROBLEM SOLVING AND IMPACT REDUCTION

Katsuo Matshushita

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Insurers have been active in Japan in raising risk awareness in society, sharing the wealth of knowledge of the insurance industry and highlighting how the actual insurance mechanism operates in delivering real value to economies and societies. This social cause as part of insurers' stated mission and vision of raising risk awareness contributes to building a resilient society against disasters and to nationwide preparedness for unforeseen events.

Risk awareness activities in Japan are undertaken by insurers, insurance associations and volunteers (such as employees and agents) and directed at policyholders, shareholders, community leaders and school children. Insurers provide loss prevention and risk management services, but also place emphasis on risk awareness education for school children, with a view to steering the younger generation towards sustainable living. They also pass on what they learn to their parents and grandparents, facilitating discussions on risk awareness with families.

Myriad programmes have been implemented. For school children, a programme was initiated in 2003 to explore the topic of disaster prevention, providing a hands-on, experience-sharing class with insurance companies' staff. On a field visit, they discover an at-risk area, the prevention facilities and the evacuation plans. They visit the police and fire stations, and, back at school, they map their findings and give a presentation. This programme was presented in 2004 in Washington, D.C., at the UNESCO session as part of the International Strategy for Disaster Reduction (UNISDR) conference. A nationwide contest has been held in Japan in which the different disaster preparedness maps drawn up by the children compete, with UNESCO attributing the award.

Programmes have also been initiated for communities, such as the elaboration and distribution of hazard maps (2002–2005) to every household, and reforestation efforts by insurance companies' staff and agents in South-east Asian countries. Mangrove forests are good for the local fishing economy and environmental preservation, but also as a defence against tsunamis. Finally, a programme for media radio anchors was introduced until 2007, designed to enable them to experience simulated earthquake, fire and smoke disasters.

It is important to emphasise the value of revisiting traditional wisdom in communities from an historical perspective. This not only encompasses historical documents on earthquakes, tsunamis and floods, but also involves highlighting lessons learned from actual episodes. Examples are: *Inamura no Hi*, when a village chief set fire to rice sheaves, a highly valuable asset, in order to warn people who were busy preparing for the autumn festival on beach of a tsunami attack; or *tsunami tendenko*, when locally children and parents evacuate quickly and individually to higher ground in accordance to a pre-set agreement among the families.

SESSION 3—HOW CAN INSURANCE MECHANISM BE BETTER UTILISED AS AN EFFECTIVE SOCIAL SYSTEM TO ENHANCE DISASTER RISK REDUCTION?

WHAT DOES THE PUBLIC SECTOR EXPECT FROM THE INSURANCE INDUSTRY? CORE PRODUCTS OF INSURANCE RISK TRANSFER AND FINANCING, AND HOW INNOVATION CAN HELP EXPAND THAT.

Ivo Menzinger

Head, Global Partnerships, Asia Pacific, Managing Director, Swiss Re.



There appears to be an encouraging and growing recognition from other stakeholders of the importance and relevance of the private sector in risk transfer and financing, and this includes the insurance industry. This is important because, despite centuries of being in existence, the industry's contribution to total economic losses in the event of disasters is still very low, particularly in emerging countries (sometimes below 1 per cent). This gap consists of foregone revenues, damaged public and private assets that are uninsured, clean-up costs, emergency relief and livelihood assistance.

In the run-up to its 150th anniversary, Swiss Re questioned how this gap could be closed more effectively. Of course, it would maintain relations with its direct insurance partners and continue to seek to increase insurance penetration by protecting more commercial and residential assets. However, beyond pricing risk and incentivising individuals to mitigate risk, for instance, through deductibles, we need to find a way to accelerate the contribution of the insurance industry to total economic losses.

We must move beyond just protecting assets and work on microinsurance and making products more cost-effective, so that more people have access to insurance with easier-to-understand products. We also need to engage sovereigns directly and discuss the contingent liabilities they may have on their balance sheets. At the end of the day, governments are the ones paying, with more implicit than explicit liabilities such as foregone revenues, clean-up costs, emergency relief, and infrastructure damage.

What can the insurance industry bring to the table to increase its contribution? We must recognise that it is a long and difficult journey, but there are some encouraging examples of risk-transfer solutions for sovereigns and sub-sovereigns to cover direct and indirect costs, insurance schemes and pools to increase insurance penetration, and simplified products for lower income populations via aggregators such as NGOs and corporates.

Innovative public-private partnerships (PPPs) exist in several areas around the world where the (re)insurance industry has engaged in conjunction with multilaterals and development banks to bring new insurance schemes into action, protecting governments' balance sheets. Parametric products, in particular, have been used to provide coverage even in cases where the industry has much less data to rely on. These have been used to protect individual sovereigns and even pools or an association of sovereigns such as in the Caribbean or the Pacific islands.

These innovations and shifting the focus towards working directly with sovereigns and sub-sovereigns, as well as efforts made on the microinsurance side, have

helped enhance the industry's contribution to disaster risk reduction—actually bringing it back to what it has done traditionally, which is providing assistance to people who are struggling.



Phang Nga, Thailand, 2004: ships destroyed by tsunami landed over 1km from the coastline.

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INSURANCE MECHANISMS TO ENHANCE DISASTER RISK REDUCTION

Olivier Mahul

Program Manager, Disaster Risk Financing and Insurance Program, The World Bank.



Governments are more and more concerned about the fiscal, economic, social and, of course, human impact of extreme events. Indeed, financial resilience against natural disasters is an imperative for sustainable development. In this regard, the World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR) have partnered to support disaster risk financing and insurance (DRFI) initiatives that help governments, businesses and households manage the financial impacts of disaster and climate-related risks.

Globally, direct financial losses from natural disasters are steadily increasing and are now estimated at more than USD 200 billion per year. Official development assistance, estimated at USD 130 billion, is not keeping pace. Financial protection is therefore a key component of disaster risk management and climate change adaptation. This consists of assessing and reducing (implicit and explicit) disaster-related contingent liabilities faced by governments, *ex ante* and *ex post* financing instruments budget appropriation and execution, and development of sustainable and competitive disaster risk insurance markets.

Financial protection is not, however, a stand-alone component and should be part of a broader disaster risk management strategy. In fact, it should not necessarily be the first aspect to be addressed. Financial protection will not reduce risk; it is just a way to reduce the cost of those losses that cannot be mitigated, and insuring the fastest and most efficient way to have access to funds in the wake of a disaster.

The other pillars of effective disaster risk management cover: risk identification (assessment and communication); risk reduction in the form of structural and non-structural measures (e.g. infrastructure, land-use planning, policies and regulation); preparedness through early warning systems, support of emergency measures and contingency planning; and resilient recovery with effective policies and the *ex ante* design of institutional structures.

Financial protection remains essential, however, and there are several products and strategies that can enhance this aspect of disaster risk management. Disaster risk financing and insurance is therefore not only about insurance or securing funds *ex ante*. In many countries—even in middle-income countries—the challenge is to execute funds and ensure that the beneficiaries ultimately get access to the funds efficiently, because there is often a gap between accessing the funds and making those funds available in a transparent and timely manner.

Furthermore, from a government perspective, it is important to find ways to reduce the fiscal burden, and this is where the private sector, of course, has an important role to play in transferring risk efficiently at the macro, meso and micro levels. In this respect, disaster risk financing is truly a public-private partnership.

Wherever the World Bank operates, it tries to involve the private sector as much as possible. In most of the initiatives in which it is involved, the World Bank is a provider of advisory services and uses its convening power (e.g. the Caribbean Catastrophe Risk Insurance Facility, the Pacific Catastrophe Risk Assessment and Financing Initiative) with strong involvement of private partners.

More specifically, the Pacific Catastrophe Risk Insurance Pilot Program (PDRFI) was set up to support small island economies highly exposed to natural disasters and reduce the fiscal impact and other costs that hamper growth and development. This programme provides coverage to five Pacific islands (Marshall Islands, Samoa, Cook Islands, Tonga and Vanuatu) for up to USD 45 million (in 2014–2015), with parametric payouts* linked to the impact of a tropical cyclone, tsunami or earthquake. Still in the pilot phase, the programme faced many challenges. One is, as a multi-stakeholder exercise, the business of involving several countries that have very specific needs and limited capacity, particularly with regard to insurance, alongside the private sector (insurance companies and donors). Another was the lack of models to assess risk; unlike in the Caribbean, starting from scratch required collecting massive amounts of information on hazard and exposure data.

The programme developed what is arguably the largest regional catalogue of risk information, at least for the Pacific, owned and maintained by the Pacific Islands Applied Geoscience Commission (SOPAC), a regional technical agency of the Secretariat of the Pacific Community (SPC) based in Fiji, with many applications generated from this model for insurance purposes, but also to inform investments in infrastructure and mitigation methods. Insurance has therefore proved to be a good catalyser, since through this programme, we have been able to demonstrate how this kind of information can be used, but there are also many other applications with the modelling and risk assessment work that has been done behind the scenes.

The programme became particularly relevant when confronted with Cyclone Pam, one of the worst natural disasters in the history of Vanuatu. Though additional assistance will be provided in the coming months, the programme ensured a rapid injection of funds of USD 1.9 million (within 10 days) to enable the government to face its immediate needs. This was among the first cash injections received by the government. In 2014, Tonga was the first country to benefit from a payout under the Pacific Catastrophe Risk Insurance Pilot and received an immediate payment of USD 1.5 million in cash towards recovery from Cyclone Ian.

* "Unlike traditional insurance, parametric instruments use a model to calculate the payout of the insurance policy. This payout model aims to closely mirror the actual damage on the ground and enables a much more rapid payment as no loss adjusters are required after the event to assess the actual damage." – Swiss Re website, [Parametric insurance solutions should play larger role in catastrophe coverage](#).

SESSION 3—HOW CAN INSURANCE MECHANISM BE BETTER UTILISED AS AN EFFECTIVE SOCIAL SYSTEM TO ENHANCE DISASTER RISK REDUCTION?

POST-DISASTER RELIEF AND RECOVERY, DISASTER RESILIENCE, PRIVATE-PUBLIC DIALOGUE AND CLOSING THE INSURANCE GAP

Anna Maria D’Hulster

Secretary General, The Geneva Association.



Insurance, where a market exists, plays an incredibly important role in the wake of a disaster. As demonstrated in Japan after the 2011 earthquake and tsunami, insurance is often the first on the ground after a disaster, with a qualified staff of engineers, claims managers and assessors who can take stock of the damages incurred and the requirements to effect restitution of the losses. Some insurance companies go so far as to organise the procurement of material in order to accelerate the rebuilding process. Beyond the damage assessment, there is the payout procedure, ensuring that the beneficiaries efficiently and expeditiously receive the money to which they are entitled. This injection of money back into the local economy plays an important role in the rehabilitation of the local economy, supplying funds for tradesmen involved in the repair and reconstruction efforts, providing support to the local population at a time of loss, and indirectly supporting local and national governments from whom the insured losses are transferred from their balance sheet onto that of the private sector in the form of the insurance industry.

The industry and The Geneva Association as a research centre are particularly concerned with catastrophe prevention, as studies by the World Meteorological Organization have shown that one dollar invested in prevention can save up to seven dollars in damage compensation.*

The Geneva Association has a working group on extreme events and climate risk that is currently looking at the economic benefits of resilience activities: direct benefits, which are admittedly not always easy to assess, but also indirect benefits, such as increased health within the population (less harshly struck by the disaster), a faster return to school for children and more rapid economic recovery.

For this reason it is important to find ways to close the insurance gap in developing and emerging countries. There are several explanations for the current situation, including cultural reasons (religious or fatalistic views), educational aspects (a lack of understanding of how insurance works), and regulatory factors. In many countries, regulation is not clear, does not even exist or is contrary to the interests of financing long-term infrastructure. There is also the issue of product availability: emerging markets need simple products that are easy to understand. There is also a need for greater transparency on what is being covered by any policy provided.

The Geneva Association and the industry are very interested in engaging in dialogue with government entities and NGOs. The know-how and power of the different parties, when combined, can achieve a great deal. This collaboration needs to be conducted intelligently, however, respecting regional and national differences (societal, cultural and political). It requires a long-term view, to

* World Meteorological Organization (2015) WMO Disaster Risk Reduction Programme, from https://www.wmo.int/pages/themes/hazards/index_en.html

address not only post-disaster recovery but also prevention. It is not always about straight financing: for example, the Australian Business Roundtable, organised by Insurance Australia Group, brought together CEOs from different industries to discuss the impact of natural disasters and what could be done in the future to mitigate this impact. The results of those discussions were communicated to the government, which then implemented them in their funding plan.

In summary, there is a tremendous amount that can be achieved, not only through the identification and tackling of gaps in the protection provided by insurance, but also through more effective collaboration between governments and the insurance industry. We at The Geneva Association are working hard to identify those gaps and develop stronger ties with governments and other stakeholders in order to realise these societal and economic imperatives.

SESSION 3—HOW CAN INSURANCE MECHANISM BE BETTER UTILISED AS AN EFFECTIVE SOCIAL SYSTEM TO ENHANCE DISASTER RISK REDUCTION?

EVOLUTION OF INSURANCE COVERING PREVIOUSLY UNINSURABLE RISKS

James Vickers

Chairman, Willis Re International.



The insurance industry sometimes has the reputation of being quite good at avoiding risks and trying to exclude them. In fact, over the past 30 years, the industry has made considerable progress in covering risks that were previously considered uninsurable.

When the Niigata earthquake struck Japan in 1964, earthquakes were not insured by anybody in Japan. That particular event drove the government and the insurance industry to work together to address that need. A law was passed in 1966 that led to the creation of the Japan Earthquake Pool, which, in the wake of Tohoku, settled over 800,000 claims and USD 12 billion in 90 days. Interestingly, 1966 was not just the start of residential earthquake coverage; it was also the time when the Japanese insurance industry began to offer insurance for commercial risks as well. That was a brave initiative at the time, with the fall-out of the 1923 Great Kanto earthquake, which almost bankrupted the Japanese insurance industry, still fresh in people's minds.

Another example is the Brisbane flood that occurred in Queensland, Australia in 1974. Again, at that time, flood cover was not given in Australia. It created a difficult situation between the Australian insurance industry and government, and the insurance industry decided that it needed to do something and provide cover. The Insurance Council of Australia set up an academic research project, in collaboration with Willis and Risk Frontier, to create a flood database. The end result is that now, in Australia, the non-life insurance industry provides flood cover, which, in the recent Queensland floods settled over a billion dollars of claims.

How has this come about? We cannot stress enough the importance of data. The underlying data that lead to improved risk quantification is really at the heart of the issue, providing insurers with the confidence to begin to assess the exposures and price them appropriately. Data sharing between the different partners is essential. Willis was involved in the Algerian catastrophe pool, which was set up about 10 years ago. There were no propriety models, no publicly available data on the geological conditions in Algeria. The only organisation that held it was the national geological institution in Algeria, who refused to provide it to any foreign organisation. Getting that information released required the intervention of the Ministry of Finance. That pool is now up and running, providing compulsory earthquake and natural catastrophe cover in Algeria, with a limit of approximately USD 500 million.

Improved risk quantification and data availability has led to an explosion in academic research. Earth science has moved on considerably, not only with public funding but also thanks to private sector investment. Willis, for example, set up

the Willis Research Network about seven years ago to fund research that was relevant and useful to our business and our clients.

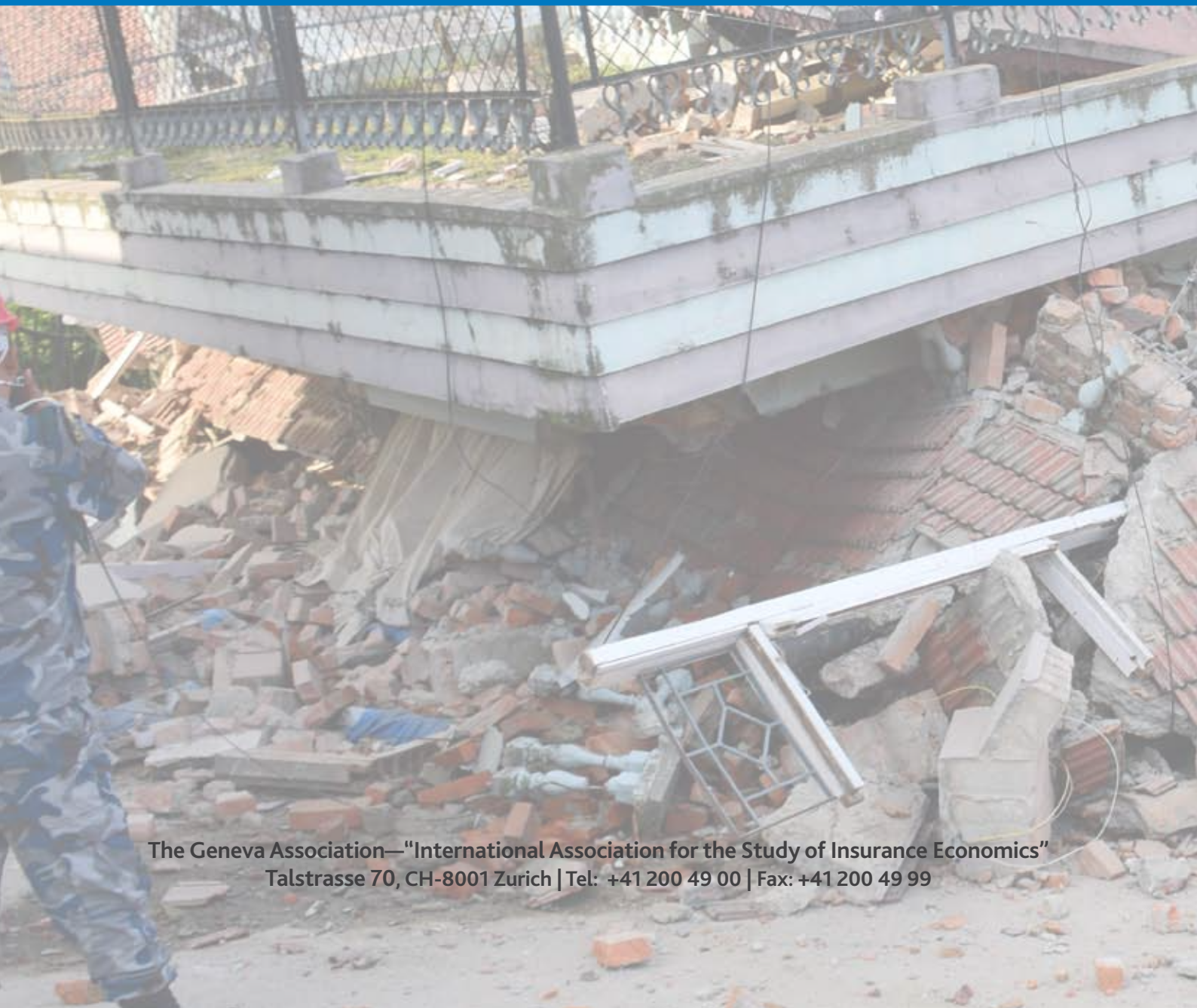
The other revolution that has happened is computing: in the 1960s and 1970s, laptop computers were absolutely unheard of, while now we can have highly sophisticated models at our finger tips. There are several factors driving demand. First, society has become more demanding. People accept risk, but they increasingly expect to be bailed out in a “no blame” culture, and this is driving demand. There are also parametric and derivative products that support traditional indemnity products. The industry is getting better at innovating around products.

Then there is the issue of capital. The global reinsurance industry finds itself in an interesting position, that of having too much capital. The rates and prices are coming down, and insurers compete in a market that is growing but not much and not fast enough. Again, through innovation in the last 10 years, outside the traditional insurance and reinsurance industry, the wider global capital markets have discovered a new asset class: insurance event risk. It performed very well during the global financial crisis; it proved that it was completely uncorrelated to any other asset classes, and now, the very long-term pension funds are looking to invest in this class. They have an absolute “wall of capital”. So far there is about USD 60 billion of capacity coming from that source; it could easily double or triple in coming years. Therefore, we now see that the insurance industry working together with capital markets to provide capacity for well-structured and thought-through schemes is not an issue anymore.

It is impossible to pull out any one of these factors as a particular reason why things have moved forward, but all of them have interacted to contribute to driving insurability and demand. We have this almost virtuous circle that allows us to design interesting products and provide the capacity behind them. We do face some challenges, however, particularly in terms of distribution and getting this capacity to the people who actually need it.



Insurance has a crucial role to play as a mechanism to reduce disaster impacts both in the developing and developed worlds. However, the role insurance can play both pre- and post-disaster is not always well understood. As part of the United Nations World Conference on Disaster Risk Reduction, 14–18 March 2015 in Sendai, Japan, The Geneva Association gathered a range of experts including insurance professionals, leading academics, and disaster risk reduction and risk modelling specialists as well as senior NGO and governmental staff to discuss the role of insurance as contributors to problem solving and impact reduction. This conference review provides a synopsis of those discussions and the main points raised at the meeting.



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