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September 11—Ten Years On
Lasting impact on the world of risk and insurance

edited by Patrick M. Liedtke and Kai-Uwe Schanz

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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.

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September 11—Ten Years On

**Lasting impact on the world of risk
and insurance**

The Geneva Association

53 Route de Malagnou,
CH-1208 Geneva,
Switzerland

E-mail: secretariat@genevaassociation.org

Tel: +41-22-707 66 00

Fax: +41-22-736 75 36

www.genevaassociation.org

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Acknowledgements

This Geneva Report is the result of a collective effort involving several leading experts from the (re)insurance industry as well as Geneva Association collaborators.

It is part of The Geneva Association's mission to anticipate, identify, analyse and communicate trends that shape the global world of risk and insurance.

We would like to thank the authors for their thoughtful contributions, the commentators for their valuable input, and the Geneva Association staff for their support—in particular, Samantha Solida for her editing, Véronique Martinez for her copy-editing, and Françoise Jaffré for her copy-editing as well as lay-out and production management work.

September 11: ten years on— Lasting impact on the world of risk and insurance

Patrick M. Liedtke and Kai-Uwe Schanz¹

Ten years after the terrorist attacks of 11 September 2001, The Geneva Association has initiated a comprehensive research effort focusing on the lasting impact of an event which was the most expensive man-made disaster for insurance ever and which in its immediate aftermath was widely viewed as heralding a new era in global politics, economics and business. This effort builds on The Geneva Association's seminal special monograph *Insurance and September 11—One Year After: Impact, Lessons and Unresolved Issues* which, written and published in 2002, has proven remarkably prescient in many respects.²

With the following collection of eight essays from leading industry economists, underwriting specialists and The Geneva Association researchers, we intend to make a meaningful contribution to establishing the event's permanent relevance for the world of risk and insurance. We also hope to stimulate our readers to consider the long-term development of the insurance industry and the various ways in which it is intertwined with human lives and activities.

Despite fears at the time, the shock of such an unprecedented attack did not plunge the global economy into a recession. As a matter of fact, in November 2001 the U.S. economy left a mild recession, triggered by the bursting of the internet bubble in 2000, behind it. September 11 did not slow the pace of globalisation and economic integration either. However, the shock of September 11 prompted the Federal Reserve (FED) to cut interest rates, arguably laying the foundation of the credit bubble which ultimately burst in 2008. Disastrously, these cuts were not reversed when the global economy exhibited a strong recovery as from 2004. The FED continued to prop up asset prices in a way that helped inflate dangerous price bubbles. This policy approach may have well been influenced by the traumatising experience of September 11.

Though less damaging and disruptive than initially feared, September 11 has ushered in an era where large unexpected shocks, which have always occurred, have become an integral part of economic and social planning activities. As a result, the long-established distinction in economics between risk and uncertainty has drawn renewed attention. Whereas risk is quantifiable and, as such, manageable and transferable through well

¹ Patrick M. Liedtke is Managing Director and Secretary General of The Geneva Association (www.genevaassociation.org) and Kai-Uwe Schanz is Special Advisor, Strategic Research, The Geneva Association.

² Liedtke, P. and Courbage, C. (2002) *Insurance and September 11—One Year After*. Available at <http://www.genevaassociation.org/PDF/BookandMonographs/GA2002-Insurance%20and%20September%2011.pdf>. The editorial accompanying this monograph is reprinted at the end of this report.

proven insurance mechanisms, uncertainty is associated with the very basic concept of life and an absence of any meaningful probability distributions. For the insurance sector, this environment presents both challenges and opportunities. Insurers are challenged by an environment which increasingly defies the traditional prerequisites for insurability: the quantifiability, randomness and mutuality of exposures as well as the economic feasibility of assuming them on an insurer's balance sheet. Reconciling these parameters with the commercial viability of the insurance business model is a Herculean task. On the other hand more uncertainty—or more correctly put, a better recognition of the uncertainty surrounding human lives and livelihoods—fuels demand for protection based on a heightened sense of vulnerability.

The fact that September 11 has proven less “game changing” than initially anticipated should not blur the view on the many significant changes to the general landscape and environment in which insurance business is conducted. The event did teach insurers and reinsurers some valuable lessons as far as the perception, underwriting and pricing of risk is concerned. These lessons go far beyond the area of terrorism insurance. They were learned and embraced and—most important—should make the industry even more resilient to withstand the next “unthinkable” event.

- The global system of risk transfer and diversification through (re)insurance proved its mettle. One of the biggest insured losses in history, totally unexpected in nature and size, was successfully absorbed, with European companies assuming a major part of the claims—even though there was not a single premium dollar set specifically aside to cover such an event. No insurance failures worth mentioning were recorded. The national and global business models of insurers and reinsurers were essentially validated.
- The global (re)insurance industry's capital base was restored quickly, not least by startup reinsurers, limiting incumbent players' scope for recouping losses. This insight prompted established reinsurers to accelerate their moves towards a more flexible and disciplined business model based on “cycle management”, leading to a certain smoothing of pricing and capacity peaks and troughs.
- A recognition about the limits of purely market-driven protection mechanisms and about wider public interests took hold. Public-private partnerships were further developed, combining the imposition of solidarity through compulsory insurance requirements with a balanced scheme of loss sharing aimed at aligning the interests of all major stakeholders. These partnerships have proven instrumental to the diffusion of terrorism insurance, as evidenced by sharply increasing take up rates.
- The event demonstrated that the presence of a strong insurance industry with an appropriate regulatory and supervisory framework is vital to public welfare, especially when societies are confronted with extreme events. It also showed how flexibly the insurance industry can react when faced with the unthinkable and some outsized event.
- In light of costly litigation and some unfavourable media coverage, the industry has woken up to the importance of contract certainty as a cornerstone of the professional conduct of business. Ultimately, September 11 has resulted in a great improvement in the quality of some business practices, notably in how to underwrite large commercial and private property risks.

- Reinsurers have redoubled their efforts to think and prepare for the “unthinkable”. In addition to enhancing traditional capabilities such as accumulation control and risk-based pricing, many reinsurance companies and intermediaries are now placing more emphasis on qualitative scenario analysis and planning. These efforts also address “innovative” forms of terrorism such as marine piracy aimed at disrupting vital trade lanes and large-scale cyber attacks. However, even though advances were made in the modelling of expected losses, the very nature of terrorism and the dynamic interplay between government policies and terrorist behaviour have not yet allowed for a satisfactory probability-based modelling of risk.
- The event had a surprisingly limited immediate effect on insurance regulation and supervision, in the U.S. or elsewhere. However, it contributed to the acceleration of national and international regulatory developments already underway. The following collection of articles provides a concise yet authoritative overview of these and many more aspects which are essential to understanding the long-term impact of September 11.

The paper from *Professor Freddy Van den Spiegel*, Chief Economist, BNP Paribas Fortis, Brussels, sets the scene. He places September 11 in a bigger geopolitical and historical context of a world which has seen sweeping changes in the years preceding and following the event: the demise of the post World War II bipolar world order, the emergence of the information economy, an unprecedented credit crunch followed by the most severe recession in 80 years and the inexorable rise of the emerging economies. He calls upon the insurance industry to develop innovative responses to address heightened levels of uncertainty—and the resulting challenges to the basic notion of insurability.

In his contribution, *Dr Steven Weisbart*, Chief Economist, Insurance Information Institute, New York, addresses the macro-economic implications of September 11, including monetary policy, shifting regional growth patterns and regulatory trends in financial markets. He also discusses the long-term effects on economic growth, in light of vast counter-terrorism and homeland security spending, more frictions in air traffic and the movement of people and goods as well as a “probability neglect”, i.e. people’s inclination to think in terms of worst-case scenarios despite their marginal probability.

Lorenzo Savorelli, Head of Research & Development at Assicurazioni Generali Group, and his colleagues *Fabrizio Ortolani* and *Paolo Zanghieri*, Trieste, shed light on the key implications of September 11 from a direct insurance perspective. They highlight the specific challenges of insuring terrorism risk in the face of dynamic uncertainty arising from the interplay between terrorists and governments. The authors also discuss a number of innovative approaches to modelling terrorism risk (using game theory and scenario building, for example), aimed at making terrorism at least partially insurable.

Peter Buetikofer, Head of Property Center, Swiss Re and *Dr Kai-Uwe Schanz*, Special Advisor to The Geneva Association, Zurich, adopt the perspective of the global reinsurance industry. They stress that September 11 was a successfully passed acid test for the global system of risk transfer and diversification. The paper also offers a discussion of the prerequisites for insurability, specific challenges presented by the phenomenon of terrorism and ways of addressing some of these through public-private partnerships. The authors conclude by highlighting some longer-term implications of September 11 on key reinsurance processes such as pricing, underwriting and accumulation control.

Gordon Stewart, Liaison Officer North America, The Geneva Association, New York, offers a personal view from the perspective of the U.S. insurance industry, focusing on the long-term political implications of September 11. He points out that, in the wake of the attacks, politicians sought and were granted greater authority and control. Against this backdrop, the insurance industry may face dramatically reduced degrees of freedom in responding to any future comparable disaster.

In his article, *Katsuo Matsushita*, Liaison Officer East Asia & Japan, The Geneva Association, Tokyo, presents an overview of the current terrorism situation in Asia and how it is linked to September 11. He also addresses changes to the Asian risk landscape in the wake of rapid economic development and urbanisation—and the potential implications for the vulnerability of Asian economies and societies to terrorism. The author also discusses the challenges facing insureds, insurers and political decision-makers in this age of heightened uncertainty.

Patrick M. Liedtke, Secretary General and Managing Director, The Geneva Association, throws the spotlight on the ramifications of September 11 for national and global developments in insurance regulation. He analyses the impact from an institutional, insurance market, insurance line of business and public perception point of view. He concludes that the event had a surprisingly small immediate effect on regulation and supervision, in the U.S. or elsewhere. However, it contributed to the acceleration of national and international regulatory developments already underway. Most importantly, it caused a great improvement in the quality of some business practices.

In his contribution, *Dr Richard H. Murray*, Special Advisor to The Geneva Association, New York, analyses the lasting impact of the insurance litigation which followed the destruction of the Twin Towers, sparked by the lessee's attempt to recover twice the insured value. Richard Murray shows that in the decade since its first modern manifestation in the World Trade Center insurance litigation, liability theory has become the favoured tool of creative lawyers, economically strained governments and concerned NGOs to achieve the socialisation of mass losses arising from mass catastrophes.

The Geneva Association is confident that this publication will go a long way in helping private and public decision-makers to identify and embrace the longer-term consequences of September 11. We are highly indebted to all experts who have contributed to this effort.

Patrick M. Liedtke
Secretary General and Managing Director

Dr Kai-Uwe Schanz
Special Advisor, Strategic Research

September 11— An epitome of a changing world

Freddy Van den Spiegel¹

The first decade of the 21st century has been marked by a rapid economic, financial, social and political transformation of the world. Throughout world history, there have regularly been sweeping changes, and they were always characterised by periods of instability, discontinuity and uncertainty. The most recent process of change is by no means finished; in fact it will likely last many years yet. The axes, however, that will define the new world order are becoming ever clearer. They will have a significant impact on the life of all citizens, governments and businesses. The unprecedented terrorist attacks of 11 September 2001 can be considered as a particularly shocking example of the confusion, uncertainty and susceptibility to “Black Swans”² of the decade. Yet it would be wrong to reduce the ongoing transition process to the “war on terrorism”.

Where the current process of change started: technological development and the triumph of the free markets

After the Second World War, the world order had found a relative balance based on two social models that, although in competition with each other, managed to bring stability: the Western free market model, including Japan, under the leadership of the U.S., and the Communist model of the planned economy, dominated by the Soviet Union. There was no “third” force as, following decolonisation in the 1960s, many parts of the world were regarded as “underdeveloped” and hardly played any political or economic role, including those countries which should become the home base of Al-Qaeda.

In the late 1980s, this bipolar order was radically changed as the result of two simultaneous events: the accelerating rise of the post-industrial economy, leading to the information economy as we know it as from the mid-1990s, and the triumph of Western free market thinking.

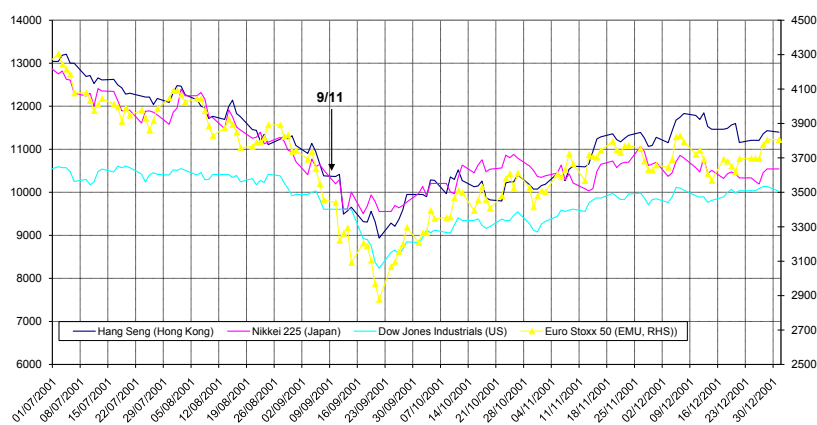
The information economy, a technological revolution comparable with the industrial revolution of the 19th century, gave rise to a totally new generation of products and services, to a radical realignment of commercial processes and to accelerated economic growth. Technological innovation became a major driver of growth. And these innovations, like the Internet, mobile phones or GPS, fundamentally changed the way societies are organised.

¹ Professor at Vrije Universiteit Brussel, Economic Advisor, BNP Paribas Fortis.

² Taleb (2010).

In political terms, too, the world has changed beyond recognition. The “new economy” was less easy to plan, as it was more the result of individual creativity than driven by political decisions and designs. The new technology was primarily a Western phenomenon, and the Communist world was increasingly ill-adapted to radically altered ways of organising societies. Partially because of this, the Western social model increasingly became accepted as the model of the future. Against this backdrop, the Communist world had no choice but to adapt, which led to the demise of the Soviet Union and the transformation of it into a market economy. China, too, pursued a pragmatic combination of a Communist political system, on the one hand, and an ultra-liberal, capitalist economy and society, on the other. Other politically stable developing countries also seized the opportunity and took part in the movement. The triumph of free markets was translated politically into an ever louder call for deregulation: the dominating thinking was that markets were more efficient than political intervention, and must be allowed to operate unfettered. The financial sector was also radically deregulated, based on an unlimited faith in market efficiency and rationality. The result of the technological revolution and sweeping deregulation was globalisation, the integration of the world economy. The growth of international trade and foreign direct investments (FDI) accelerated.³ “Just in time” became the new motto of economic organisation, where products and services from around the world were delivered into the globally organised production process. And in the financial sector, too, integration and, as a consequence, vulnerability reached new heights, as evidenced by the global financial market shockwaves aggravated by the events of September 11.

Stock market evolution in H2 2001



Source: Datastream

The exceptional benefits of globalisation

While some politicians and analysts were initially sceptical of this new “world model”, the benefits of it soon appeared to be immense as a result of the complementary nature of the world’s economies.

Large parts of the manufacturing sector were shifted to countries offering cheap labour. On the back of this shift, many of those countries managed to grow out of their stifling

³ See Chart 6 on p. 20.

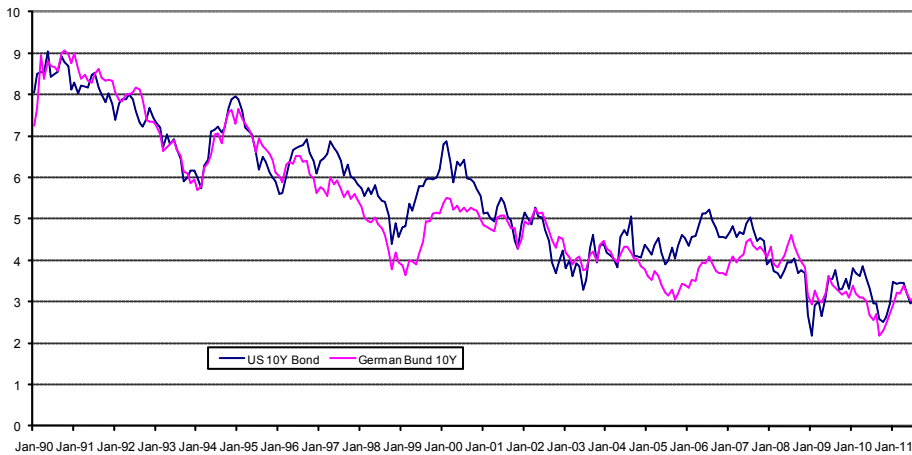
underdevelopment.⁴ For highly developed countries, this meant however that many unskilled jobs disappeared. Politically, this translated into an urge to invest even more in information technology: new jobs in education, innovation, research and development largely offset the loss of low-paid jobs.

GDP/capita growth 1990-2010 in %	
EU	78
U.S.	104
Brazil	212
India	235
China	1,184
Russia	1,715

Sources: IMF, BNPPF.

The increasing use of low-cost countries in production processes meant that industrial and high-tech products became ever cheaper. It seemed that inflation had finally been beaten, despite the enduring strong growth of the world economy. Many economists dreamed of the “Great Moderation”, and of a world where perfect monetary policy could spell the end of crises.⁵ In any case, interest rates around the world started out on a long downward track, which meant continual support for the valuations of all sorts of assets, including financial ones.

Evolution of long-term interest rates in the U.S. and Europe



Source: Datastream

⁴ At the same time, the growth gap within the former group of developing countries widened, giving rise to a sentiment of being left behind in a number of countries which were associated with international terrorism, as culminating in September 11.

⁵ The economic and financial crisis of 2008 and 2009 has arguably brought the period of the Great Moderation to an end. PIMCO considers this period of “predictable policy, low inflation and modest business cycles” to be roughly between 1987 and 2007. See *Business Week*, 21 July 2010.

Furthermore, the funding of rapid industrialisation in the new world was extremely easy, despite the huge amounts of capital required. There was an abundant supply of capital because a number of new economies, led by China, exhibited extraordinarily high savings ratios, partially driven, of course, by the absence of any meaningful social security framework. This money, incidentally, was not just used domestically, but also invested in foreign currency-denominated assets. The Asian “savings glut”, as Benjamin Bernanke called it,⁶ allowed countries with unsustainable structural deficits to ensconce themselves, causing a systematic overheating of Western asset markets.

Finally, the period was a “big party” for large parts of the financial sector (with most insurers being a notable exception), which could count on the easy availability of abundant funds, falling interest rates, and the naive belief in the ability to manage risks in a quasi-scientific way thanks to efficient and rational markets and sophisticated quantitative models.

The engine sputters: the new model discovers its limits

From the turn of the millennium, there were some first indications that the new world model of unbridled growth had reached its limits.

Economic complementarity within the integrated world economy is significantly diminished. The new emerging countries are no longer happy with unskilled jobs, but have their own ambition and the potential to also build a knowledge-based competitive edge, allowing them to increasingly compete with the established developed countries. Multinational companies are well placed to respond to this given their global reach, but their home countries are losing their key role. Phenomena such as the jobless recovery in the U.S., while U.S. businesses perform excellently, are striking examples.⁷

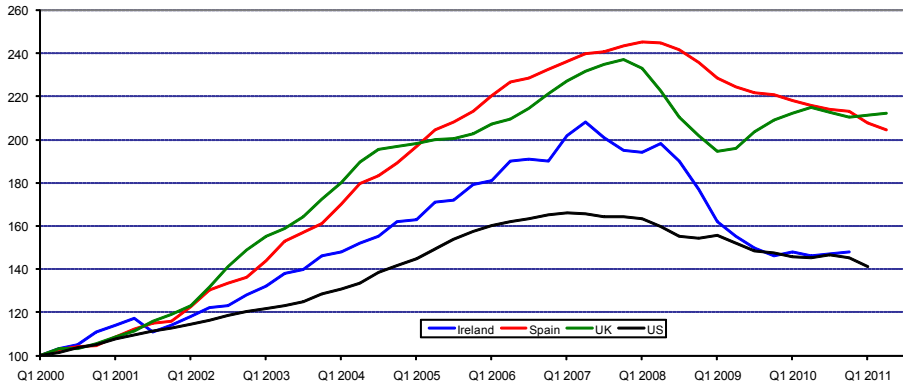
Interest rates have plummeted to historical lows. Any further fall would, however, conjure up the spectre of deflation. In turn, emerging countries such as China, and many others, begin to wrestle with inflation. The period of falling interest rates therefore appears to be over, creating more uncertainty on financial markets and generally tempering growth outlooks.

The Asian “savings glut” clearly has politically sensitive side-effects. The newly industrialised countries are increasingly acting as major *sources* of FDI, taking over important parts of the economic fabric of the Western countries. This leads to increasing frustration in the West and to calls for “new industrial policies”. Slogans like “buy American” take on new intensity, even though they are opposed to the principles of globalisation.

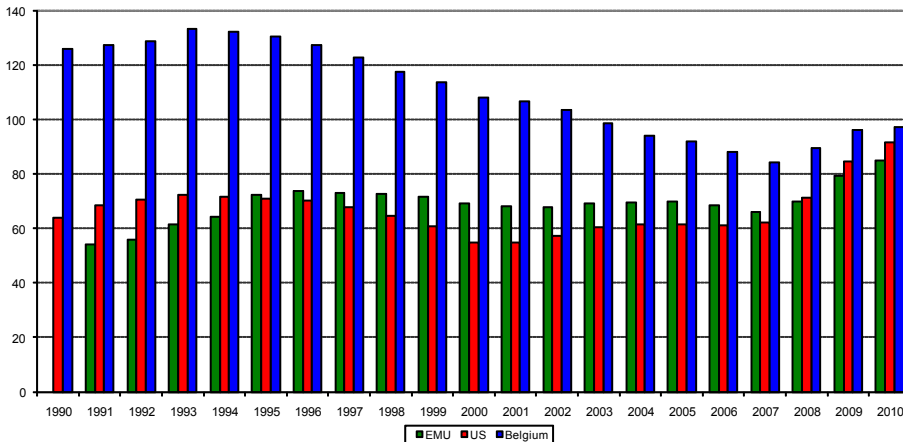
The ease and the low cost of financing deficits left many countries, not least many developed countries, with an addiction to systemic imbalances. The U.S. now has 20 years of consecutive trade deficits on record, taking its external debt to unsustainable levels and making China its biggest creditor. In Europe, too, cheap money has wreaked havoc: sharply correcting property markets, countries with excessive public debt and a banking sector that still depends on massive government intervention and cheap funding from the central banks. Some of the strongest pillars of the Western economies appear to creak.

⁶ Bernanke (2005).

⁷ Complementarity still exists but has arguably moved to a more sophisticated level. For example, many highly specialised European manufacturers, most of them SMEs, thrive on booming demand from emerging markets.

House price evolution in selected countries (rebased, Q1 2000 = 100)

Source: Datastream

General government gross debt (% of GDP) IMF Figures

Source: Datastream

The long period of high global economic growth also appears to be slowly reaching its technical limits: the old problems of the 1970s, analysed in the report of the “Club of Rome”⁸ on the limits to available raw materials and energy on the planet, have regained attention, but now come with an additional ecological dimension: the scarcity of drinking water and the threat of global warming are proving harder to bring under control than energy shortages. The burning question is the extent to which human behaviour contributes to global natural disasters, and how that behaviour might be changed to prevent them. Also this uncertainty gives rise to nationalistic reactions: every country tries to find a solution for its own population, creating more geopolitical tension because the problems are, by definition, global in nature.

The efficiency gains of a fully integrated global production process, combined with just-in-time deliveries and intensive international trade, were called into question by events

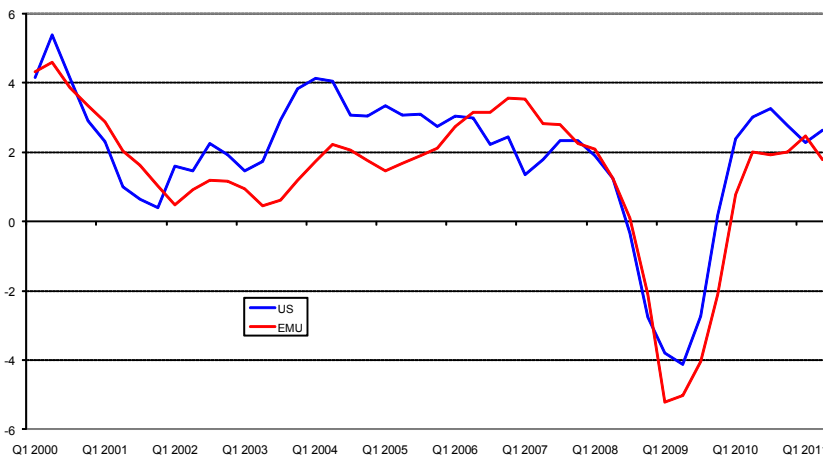
⁸ Meadows *et al.* (1972).

such as the explosion at the nuclear reactors in Fukushima, Japan. The complexity of the production chain brings vulnerabilities when one of the many links, in this case the supply of semiconductors, breaks. The focus of business in the future will be more on securing the processes, even if this means some loss of efficiency. As it happens, the same considerations are very much relevant to the entire integrated financial system. A new balance will have to be found between the efficiency gains of integration and an increased vulnerability to systemic shocks.

The crises since the start of the century: Similar at first glance, yet fundamentally different

The world economy is apparently coming out of the crisis, with a strong rebound in 2010 and probably 2011 back to the level of before 2007. But the fundamental problems are not resolved, and growth remains uncertain and vulnerable.

Real GDP growth in U.S. and EU (% YoY) OECD Figures



Source: OECD

In fact the economic and financial crises since the start of the current century follow one another in rapid succession, and each has more drastic consequences than the one before it. They clearly illustrate the increasing chasm between ever higher expectations and the real limitations. Some are openly talking about the failure of the free markets, which seem incapable to bring about a sustainable economic balance.⁹

The various crises hit the highly developed economies particularly hard. The crisis caused by the crash of the stock markets in 2001 dragged on for two years, but was merely an “ordinary” crisis after years of irrational exuberance in technology stocks. Yet they revealed the vulnerability of the Western markets very clearly.

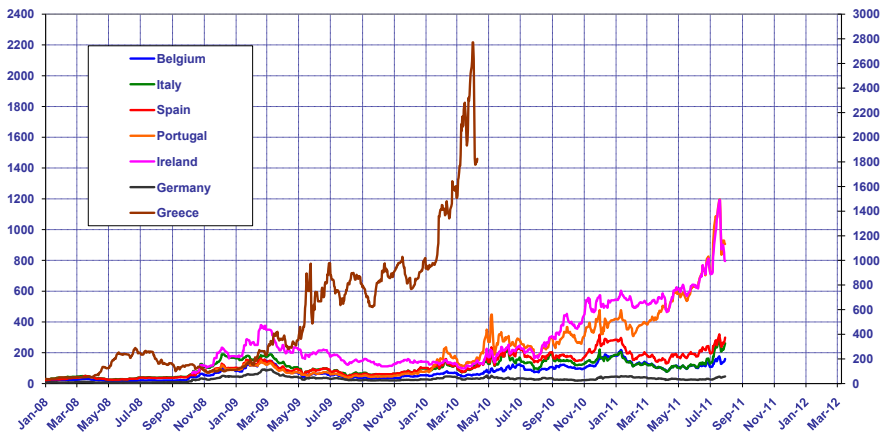
Barely four years after the recovery, we found ourselves in another deeper, more painful crisis.¹⁰ It started as a minor “technical” incident in a relatively minor U.S. market—the subprime mortgage market—in the summer of 2007. Given the limited scope of the market, just US\$1,600 billion, the potential fallout did not seem overly serious. Yet a

⁹ For example Posner (2009).

¹⁰ See Liedtke (2010).

year later, in September 2008, the entire global banking system was in ruins. The rescue of this system, again largely a Western challenge, proved difficult and created a massive haemorrhage of public finances. Yet in 2009 the financial crisis spread to the real economy and led to a recession, again primarily in the rich West. This recession too cost a fortune to governments. The result was that from 2010, the creditworthiness of many Western countries was being called into question. Europe was torn between some countries that had held up well, such as Germany, and other countries that were declared bankrupt by the markets, such as Greece. In early August 2011, even the AAA credit rating of the U.S. was reduced by one notch. It is therefore no surprise that questions emerge on the stability of the established currencies of the rich West: what is the future of the dollar, currency of an economy that is up to its ears in debt? And what is the future of the euro, currency of a region that is drifting further apart? So far, no viable alternative has been found, but this does not necessarily inspire confidence as to renewed monetary stability.

***CDS premia for insuring against default on government bonds (5Y Senior)
(29/07/2011)***

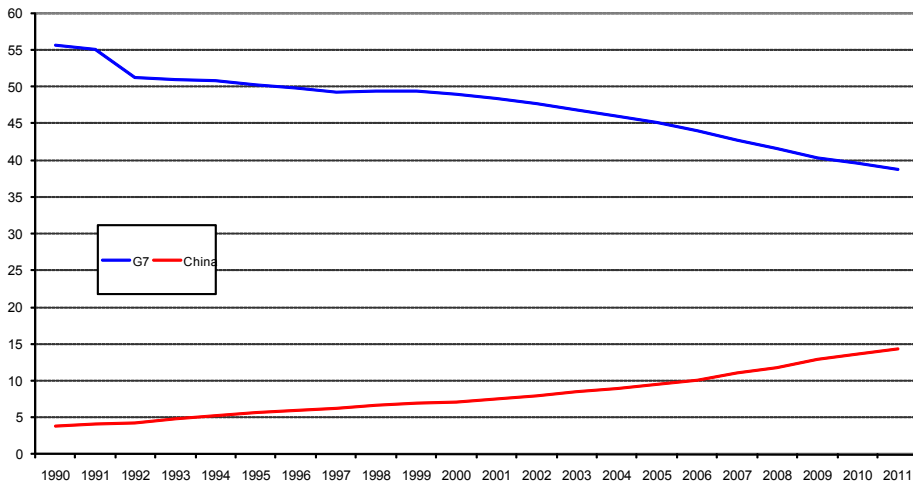


The cost of the crisis is immense: financial losses equal 30 per cent of global GDP, 20 million people have lost their jobs, the reduction in economic growth was equivalent to more than 5 per cent of global GDP.¹¹

At the same time, the global economic balance of power is shifting. Twenty years of rapid growth in the new economies at about 7 per cent, combined with more pedestrian growth in the old economies at about 2 per cent, are leading to a totally new distribution of economic weights. In 1990, the seven biggest economies in the world, the G-7, represented 56 per cent of the global economy. By 2010, this share had fallen to 40 per cent. The question that is occupying economists is not if, but when China's economy will be the world's biggest, with most pundits expecting this to happen in the early 2020s. It goes without saying that such shifts in economics might well have an impact on the geopolitical balance of power, too.

¹¹ Sources: World Federation of Exchanges, International Labour Organization, IMF.

GDP share of world total (PPP based) IMF figures



Source: Datastream

The world today: a long list of challenges, including the need to redesign world governance

All the problems mentioned above need to be tackled, and will demand flexibility, new solutions and far-reaching international coordination and cooperation. Finding a new balance requires a more realistic common understanding of fundamental opportunities and risks. Developing this vision will be time-consuming and inevitably include moments of confrontation between the various points of view. And above all, it is a discussion that must be perceived as a win-win proposition by everyone. These discussions are in progress. The G-20 is the political platform on which the leaders of the 20 most powerful nations endeavour to plan the future of our planet, in increasingly closer cooperation with the IMF, the other organisation with a global vision, which, since the Second World War, has focused on promoting stability and international cooperation.

The political agenda has clearly taken precedence now. Political discussions are not just a reflection of market logic. Politics follow a different system of logic, with a different timeline and priorities.

It would be all too easy to predict a sombre future in which none of these problems are solved, leading to even greater geopolitical tension, protectionism and a loss of all the gains of previous globalisation. Such a scenario was particularly virulent in the immediate aftermath of September 11 when there was a strong sentiment of renewed isolation. In the meantime, fears about such a scenario have receded and given way to a profound realisation that this world, given our current technology, is by definition globalised. Every unilateral decision that would arbitrarily affect other countries, would come back like a boomerang with negative effects for everyone. The reality means that common solutions are the only way ahead, even if they are difficult to find and time-consuming to develop.

How to deal with heightened uncertainty

Economists make a subtle but crucial distinction between risk and uncertainty. Both concepts mean that one cannot predict how the future will look. Yet risk is a form of uncertainty that is quantifiable based on probability distributions, and is therefore manageable and economically transferable. Absorbing and transferring risk has traditionally been the mission of the insurance sector. But in a world of uncertainty where “Black Swans” emerge at an ever higher frequency, there is an increasing number of instances where probability distributions are simply not available.¹² This leaves economies and societies with uncertainty. The response to uncertainty is vigilance and flexibility: be prepared in case the unpredictable turns into reality. This environment is both a challenge and an opportunity for the insurance sector. More uncertainty creates the need for more protection based on a heightened sense of vulnerability. But there is one big challenge insurers have to address when capturing this potential: they need to come up with solutions which respond to an environment which increasingly defies the traditional prerequisites to insurability: the quantifiability, randomness, mutuality of exposures and the economic feasibility of assuming them on an insurer’s balance sheet. Responding to this challenge is difficult to reconcile with the commercial viability of the insurance business model. However, failing to respond could jeopardize the industry’s long-term “license to operate”. This dilemma was highlighted by September 11 and will reemerge with each new “Black Swan”. Resolving it will require both innovative thinking from the industry as well as a conducive legal and regulatory framework.

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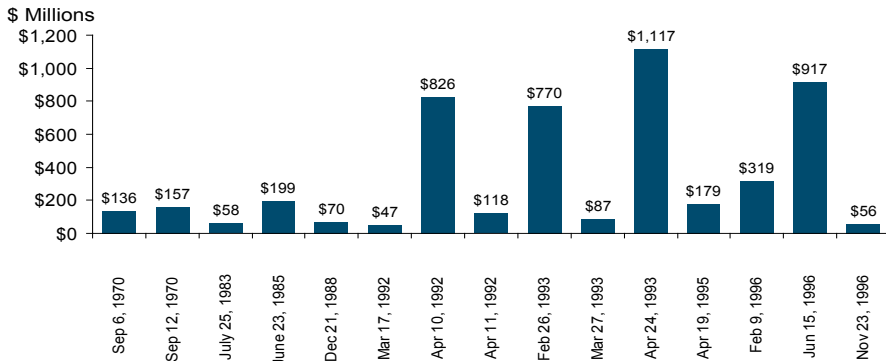
¹² Of course, there remains a large number of easily insurable risks (e.g. natural disasters) with good knowledge of probability distributions.

Risk and insurance in a post-September 11 world

Steven Weisbart¹

In the U.S., terrorism against private, insured properties wasn't a new experience in 2001. At least 15 separate incidents over the preceding 30 years each involving at least US\$50 million in claims—some also involving hundreds of lives lost—made property owners and insurers aware of the issue (Chart 1)². But after the terrorist acts in the U.S. on 11 September 2001, the framework for thinking about this risk changed. The change occurred not just because the scale of the losses was several orders of magnitude larger than anything seen before (over 20 times the previous record direct property loss and roughly ten times the loss of life). The change occurred because the attacks seemed to herald a new era of vulnerability, not just in New York and Washington, but anywhere.

Chart 1. Pre-2001 worst terrorist acts involving insured property losses (in 2010 US\$)



Through 15 incidents in the prior 30 years, the possibility of terrorism involving significant property damage and loss of life was well known before September 11, 2001. Yet everything seemed to change after that day.

Sources: Swiss Re; Insurance Information Institute.

¹ Senior Vice President and Chief Economist, Insurance Information Institute.

² This doesn't include terrorist acts against public/government facilities, such as embassies and military installations, and it doesn't include acts that mainly resulted in injuries or deaths, such as the attacks at the 1972 Munich Olympics.

They were described as the first attack on American soil since Pearl Harbor in 1941.³ Both figuratively and literally, the airplanes in the September 11 attacks came out of a clear blue sky. Indeed, a new term—“Black Swans,” from the book by Nassim Nicholas Taleb⁴—connoting huge, completely unexpected shocks, entered the economic and political lexicon.

September 11: forecast consequences and actual outcomes

One sign of the changed framework was the publication, in December 2001, of a major International Monetary Fund (IMF) World Economic Outlook report entitled *The Global Economy After September 11*. At the top of chapter 1, the IMF wrote

“The outlook for the global economy has deteriorated further in recent months, with growth continuing to weaken in almost all major regions of the world. The tragic events of September 11 and their aftermath, as well as evidence that the world economy was weaker than expected in the period before the attacks, contributed to a sharp deterioration in confidence across the globe, accompanied by a flight to quality in both mature and emerging markets, and...the outlook remains highly uncertain, and there is a significant possibility of a worse outcome.”

As the IMF report noted, the 11 September attacks occurred in the midst of a period of global economic weakness, so that not all of the effects could properly be attributed to terrorism. Yet the report acknowledged that two elements—how long it would take to restore confidence and the cost of a significantly stepped-up war on terrorism—were new reasons why *“the [global economic] outlook is subject to great uncertainty.”*

Uncertainty had already been rising when the terrorists struck on September 11. In the U.S., the Chicago Board Options Exchange Volatility Index (VIX) is often used as a measure of this sense of vulnerability (Chart 2). In 1997, the VIX shifted from indicating low anxiety (values under 20) to moderate anxiety (values in the 22 to 25 range), although September 11 and related events nudged it higher (26-27); it remained elevated for seven years. Calm returned in 2004 and prevailed for four years, until the crisis years of 2008-09.

The IMF December 2001 report’s Chapter 2 raised *“the question of whether the attacks are likely to have a long-term impact on long-term productive potential around the world by raising the costs of transactions.”* The report noted five types of such costs:

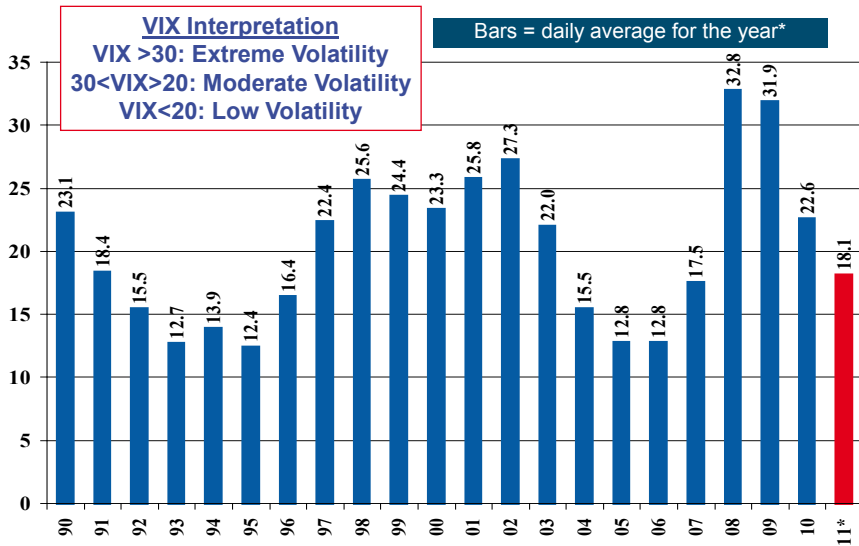
- higher operating costs, including the effects of supply-chain disruptions;
- higher levels of inventories, to offset supply-chain and transportation disruptions;
- higher risk premiums, not only insurance but higher interest rates, lower equity prices;
- shifts of resources from civilian to military uses, including labour force and R&D activities; and,
- shifts away from globalisation, to offset supply-chain and transportation disruptions.

There is no question that, in the post-September 11 decade, significant ongoing anti-terrorist activities have drained resources from other pursuits and, beyond explicit anti-terror activities, significant indirect costs and lower opportunity costs have left the world’s economies and their citizens worse off. Although neither the IMF nor anyone

³ Of course, such a description ignores the bomb set off under New York’s World Trade Center in 1993 and the bomb set off outside the Murrah office building in Oklahoma City in 1995.

⁴ Taleb (2010).

Chart 2. VIX volatility index



*As of 28 June 2011.

Source: Chicago Board Options Exchange

else has attempted to measure costs using the five categories in the IMF December 2001 report, several analysts have recently published cost estimates, and some of them have identified other types of costs not in the IMF's original analysis.⁵ For example, Stiglitz highlights “*expenditures required to provide healthcare and disability for returning Veterans. These are likely to be very, very high. We will be paying these bills for decades to come.*”⁶ Mueller and Stewart estimate annual opportunity costs to the U.S. economy in the US\$40+ billion range.⁷ Stiglitz, citing different opportunity costs, says that the economy would have grown more if outlays to fight terrorism had instead been invested in ways that would have increased America's productivity in the future. From the insurance industry's standpoint, other things equal, slower economic growth means slower growth in exposures.

The December 2001 IMF report concluded that, in the grand scheme of things, “*the impact on potential output would have to be extremely large to be clearly visible when compared to the natural variation in these statistics caused by cyclical phenomena.*” Rose and Blomberg⁸ would disagree. In a January 2011 paper that summarises several measurement approaches by them and others, they claim the September 11 attacks cost

⁵ As is often the case in issues like this one, there are differences of opinion regarding what to include in the measurements. For example, in relation to the U.S.'s “War on Terror,” I include the cost of military and related activities in Afghanistan but not in Iraq.

⁶ To merely suggest how large the healthcare and disability outlays might be, Stiglitz notes that “*almost 40 percent of the 700,000 who fought in the 1-month Gulf War [in 1990] have become eligible for disability benefits, and we are paying more than \$4 billion a year for disability benefits from that short war.*” Later in his testimony Stiglitz guessed that the eventual total from the Iraq war “*may total half a trillion dollars or more.*” (U.S. Government (2008), Statement of Joseph E. Stiglitz, 8 February 2008).

⁷ Their two largest such costs are “*deadweight losses and losses in consumer welfare*” (US\$30 billion) and “*passenger delays caused by airport screening*” (US\$10 billion) (Mueller and Stewart, 2011).

⁸ Rose and Brock Blomberg (2011).

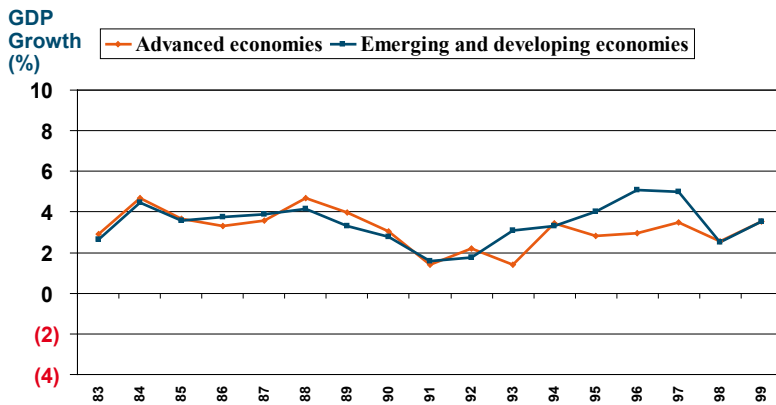
U.S. GDP US\$60 billion (2006 dollars), or about a 0.5 percentage point decrease in GDP growth. However, they explicitly exclude the cost of the Iraq war from their analysis, and it isn't clear whether the cost of the war in Afghanistan is included or not.

A little over six years after the IMF post-September 11 report appeared, Stiglitz did indeed support the IMF's forecast, explaining why the effects of September 11 would be hard to spot: *"the macroeconomic effects were being hidden by loose monetary policy, a flood of liquidity, and lax regulation."* Stiglitz was referring to the U.S., but his comments apply as well to most of the rest of the developed economies. The loose monetary policy in the early and middle of the decade is likely more properly attributable to the global recession that pre-dated September 11 (and that was exacerbated by the terrorist attacks), rather than to the attacks themselves.⁹

Growth history and prospects around the world

Insurance growth accompanies and facilitates broader economic growth. So to the extent that September 11 affected the course of economic growth, it also contributed to the development of insurance and reinsurance activity. From 1983 through 1999, the economies of emerging and developing countries grew at about the same annual rates as advanced economies, with rare exceptions in 1991 and 1996, when the countries classified as emerging/developing economies grew roughly 200 basis points faster (Chart 3). But the exceptions became the norm in the new millennium, and the IMF forecasts that this gap will persist through at least 2012 (Chart 4). The gap appeared both because growth rates in advanced economies slowed in 2000-11 vs. 1983-99 and because growth rates rose in emerging/developing economies in the later period vs. the earlier one.¹⁰

Chart 3. World GDP growth, 1983-1999



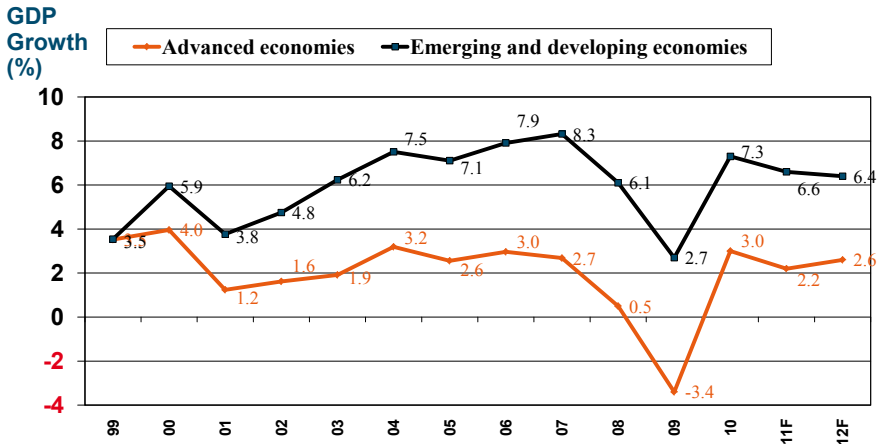
Since 1999, emerging/developing economies have grown roughly twice as fast as advanced/developed economies.

Sources: (forecasts) International Monetary Fund, *World Economic Outlook*, April 2011; Insurance Information Institute.

⁹ See also Liedtke and Courbage (2002) report which tallied the impact and shone the light on some key challenges.

¹⁰ The selection of 1999-2000 as the dividing point between these growth rates could be challenged. One could make a case that the break came after 1995, and that the absence of a gap in 1998-99 was an exception. A 1995 dividing point might be based on the first effects of major economic policy reforms in India and China, and it would place the financial crisis of 1997-98 in the "new normal" period.

Chart 4. World GDP growth, 1999-2012F

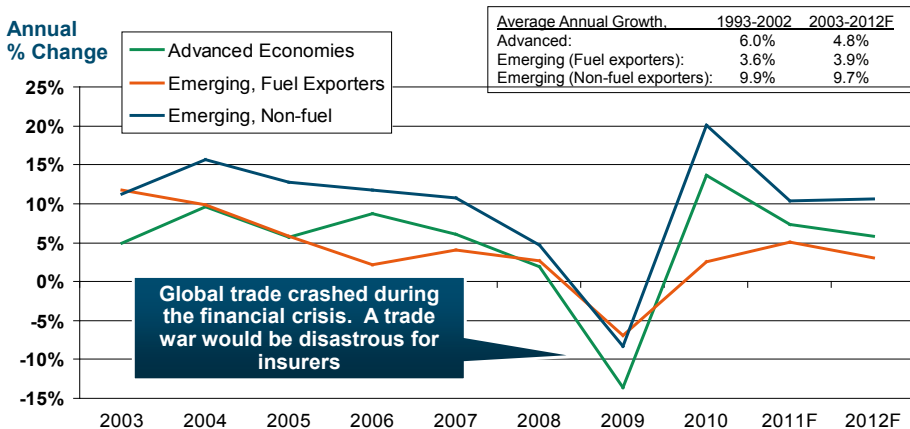


Since 1999, emerging/developing economies have grown roughly two-to-three times as fast as advanced/developed economies.

Source: (forecasts) International Monetary Fund, *World Economic Outlook Update*, June 2011; Ins. Info. Institute.

World economic growth was becoming increasingly cross-border by the end of the 20th century and the first decade of the 21st, and that trend promises to continue growing at a rapid pace in the second decade (Chart 5).¹¹ The emerging/developing economies, with their lower labour costs, were able to deliver goods and services that advanced economies found attractive, and so substantial outside capital was invested to further

Chart 5. Change in volume of exports of goods: 2003-2012F



Average Annual Growth,	1993-2002	2003-2012F
Advanced:	6.0%	4.8%
Emerging (Fuel exporters):	3.6%	3.9%
Emerging (Non-fuel exporters):	9.9%	9.7%

Global trade crashed during the financial crisis. A trade war would be disastrous for insurers

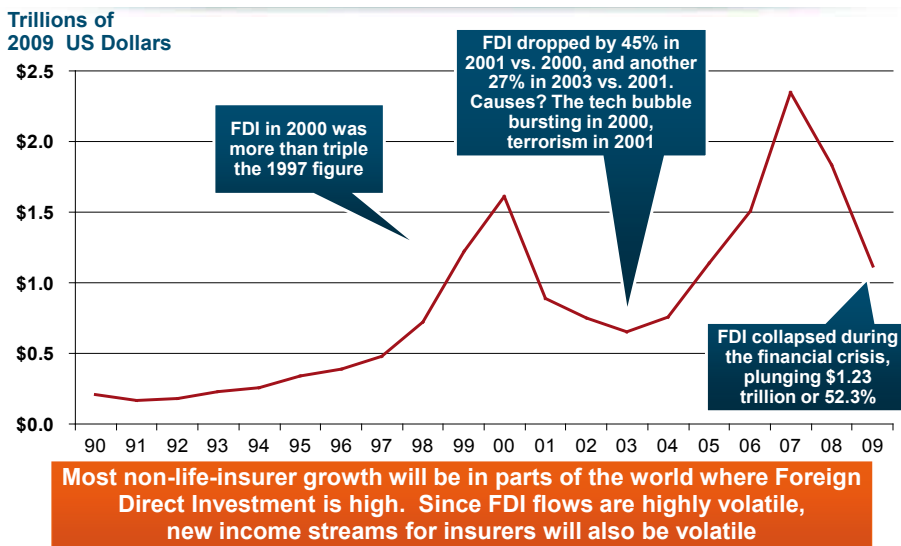
As the advanced economies have shifted more to service/knowledge-based economies, their exports of goods have declined. Emerging economy non-fuel exporters have maintained their white-hot growth rate for two decades.

Source: IMF, *World Economic Outlook*, April 2011, Table A9.

¹¹ Note that this chart doesn't include the growing trade in services, which amplified the goods record.

expand the emerging economies' productive capacity (Chart 6). In addition, some of the emerging economies worked to build their domestic demand as well, so that they were not so dependent on exports for economic growth. Insurers during the decade increasingly sought entry into emerging market economies, both because exposures were growing rapidly there, but also because businesses in these markets increasingly understood the value of insurance in protecting and growing their business. A third factor may have been the liberalisation of market access which gathered pace since the late 1990s, especially in China and India. Nevertheless, growth in emerging/developing economies was not uniformly high; indeed, some grew at only slightly higher rates than most advanced economies (Chart 7), implying a three-speed growth pattern.

Chart 6. Global foreign direct investment, net inflows: 1980-2009



*Foreign Direct Investments are defined as the net inflows of investment to acquire a lasting management interest (at least 10% of voting stock) in an enterprise operating in an economy other than that of the investor.
Source: World Bank; Insurance Information Institute.

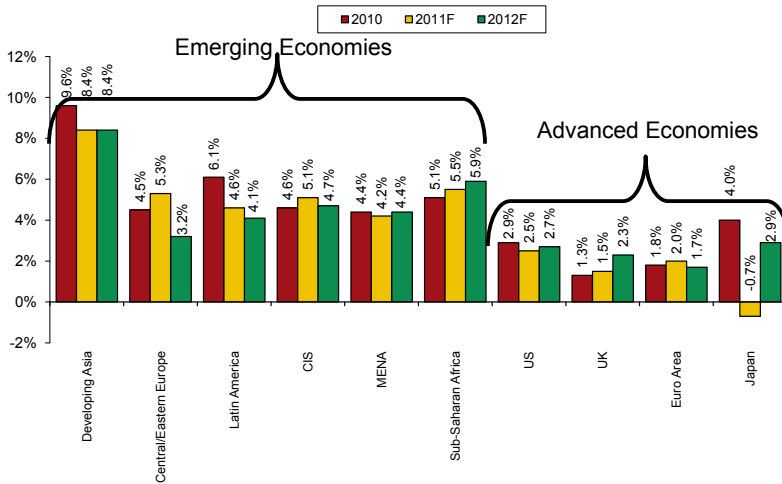
The development of economic growth and international trade affects risk and insurance in at least three ways. One way is the increased scale—so much more is at stake than was the case previously. As a result, there is pressure/opportunity for insurers to offer greater insuring capacity. This is particularly true if measures of insurance usage—penetration (premiums/GDP) and density (premiums/capita)—are growing as well. Charts 8 and 9 indicate that this has been the case for some emerging/developing economies over the past decade; there has been little change in these measures for most advanced economies since 2001.¹² The impact of these different growth rates is reflected in growth rates for life and non-life insurance premiums, as shown in Charts 10 and 11.

A second way economic growth and international trade affect risk and insurance is the heightened risk from increasing dependence on the reliability and acceptable cost of producing and transporting goods from one part of the globe to another. As a result, a

¹² In most developed countries, the financial crisis of 2008-09 saw a sharper drop-off in insurance premiums than in GDP or population, resulting in declines in penetration and density measures in 2009-10. It is expected that these measures will rebound to their pre-crisis levels as these economies recover.

breakdown in a supply chain has more significant consequences than it would have had previously. September 11 in particular has made companies more aware of their sourcing issues and the recent 11 March 2011 earthquake and tsunami in Japan has once again demonstrated the degree of vulnerability of highly interconnected supply chains. It is arguably one of the lessons learned in 2001, and re-learned in 2011, that enterprises need to create a more resilient physical infrastructure and better logistics. Insurers could help them meet these challenges.

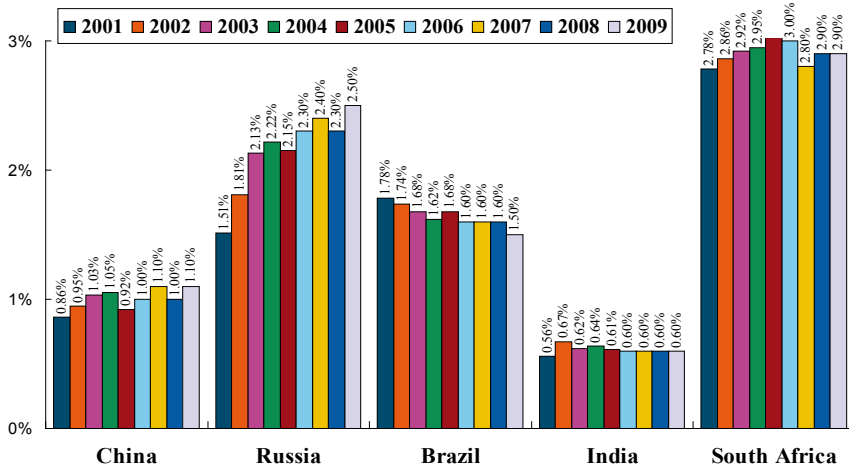
Chart 7. Recent/forecast GDP growth, selected economy groups, 2010-2012F



GDP is growing at about 2-3% in advanced economies, and about 4-5% in most emerging economies, but 8-9% in “developing Asia.”

sources: IMF, World Economic Outlook, June 2011; Insurance Information Institute.

Chart 8. Non-life premium/GDP* (penetration) for emerging economies, 2001-2009

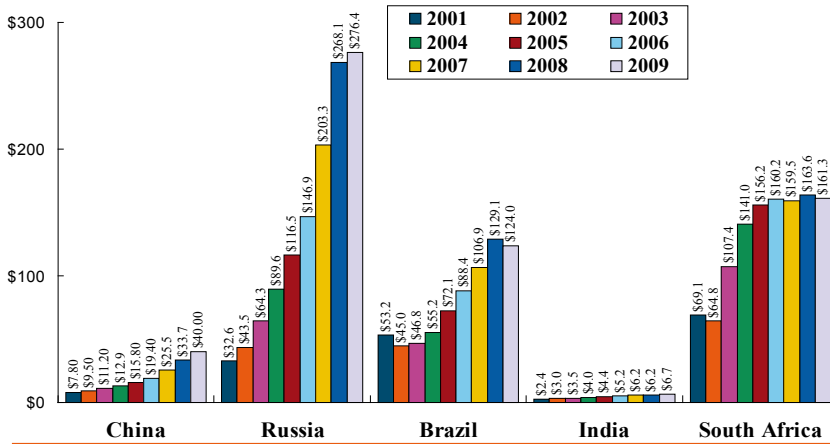


From 2001-2009, Penetration in China and Russia grew steadily—an especially strong showing in light of the rapid growth in GDP (denominator in the Penetration ratio). Similarly, although the Penetration ratios in Brazil and India were essentially flat, that means premium growth basically kept pace with exposure growth.

*both measured in U.S. dollars; premiums exclude cross-border business

Source: Swiss Re sigma, various volumes

Chart 9. Non-life premium* per capita (density) for emerging economies, 2001-2009

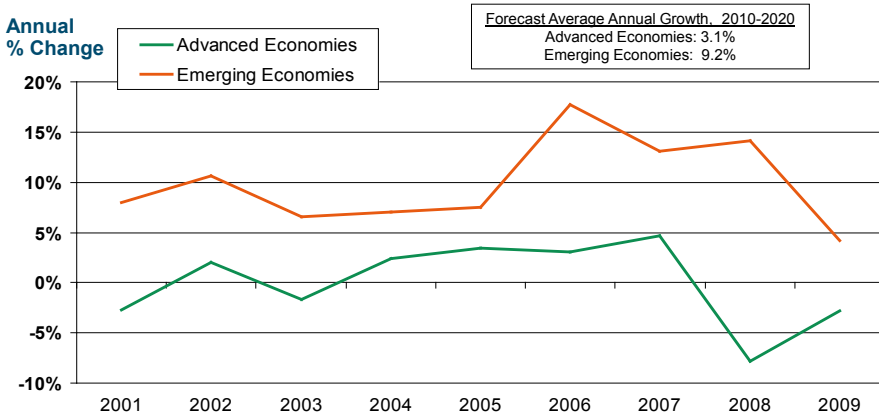


From 2001-2009, Insurance Density in India tripled, and in China it grew 5-fold. But the most spectacular Density growth in these years belongs to Russia: in 2009 Insurance Density in Russia was 9 times what it was in 2001!

* premiums measured in U.S. dollars, exclude cross-border business

Source: Swiss Re sigma, various volumes

Chart 10. Life insurance real (inflation-adjusted) premium growth, 2001-2009



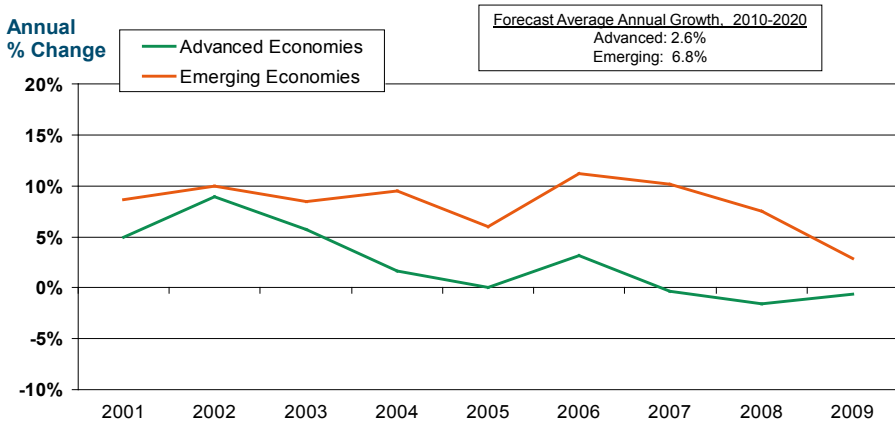
In 2000, life premium volume in emerging economies was 9% of the world's life premiums. By 2009 that rose to 12.2%. In nominal terms, life premiums in emerging economies grew at an 8.5% pace, compounded, from 2000-2009.

Source: Swiss Re, sigma, various years

Two other contemporaneous developments were the growth of internal markets in emerging/developing economies, particularly in China and India, and political instability in some of those markets, particularly in the MENA (Middle East and North Africa) countries. Economic growth and trade increases targets that are presented to actors who would disrupt this growth. On the other hand, we have seen riots and civil commotion in countries where economic growth has not been sufficient to absorb a rapidly-growing

young workforce. As a result, new levels of political risk, both in frequency and severity, now appear to be present—levels for which actuaries usually have little useful experience or insight on which to base coverage rates.

Chart 11. Non-life insurance real (inflation-adjusted) premium growth, 2001-2009



In 2000, nonlife premium volume in emerging economies was 9.9% of the world’s nonlife premiums. By 2009 that rose to 14.3%. In nominal terms, nonlife premiums in emerging economies grew at an 11.7% pace, compounded, from 2000-2009.

Source: Swiss Re, *sigma*, various years

The overall threat level does appear to be rising. Each year Aon maps its assessment of political risk, including terrorism. In 2011 no country was rated as having negligible risk, compared to 2010 in which North America, Western Europe, and Australia and New Zealand were classified in the safest category. In 2011 many other countries were considered riskier places to do business, as well, primarily the MENA countries where strikes, riots, and other civil commotion now top the list of concerns of many firms, including insurance companies.

Yet another aspect of economic progress in the last decade—and certain to persist in the coming decade—was the development and increasing use of some large-scale and high-risk technologies, such as offshore oil drilling miles below the ocean surface, or “fracking” to recover natural gas. The Deepwater Horizon explosion and subsequent oil spill in the Gulf of Mexico in the spring and summer of 2010 brought vividly home to many not only how difficult it is to contain mishaps when they occur, but also how many other drilling platforms and similar large-scale high-risk/high-severity enterprises existed. Terrorists didn’t cause the explosion and subsequent problems containing the spill, but they could have; nearly a decade after September 11, some businesses are still not thinking about risk management in holistic ways. Insurers have traditionally been helpful in bringing risk management skills to such exposures, in addition to risk coverage; even in the developed world, the application of such new technologies can be a source of growth for the insurance industry.

Another technology evolution that, since September 11, has become a giant challenge, but also an opportunity for insurers and many other goods and service providers is the ability to use vast amounts of personal data to reach new levels of customer granularity in providing price and product. This development has also given rise to a comparable giant threat in the form of the vulnerability of the data to theft, corruption, and liability for failure to protect privacy. Most businesses with significant data (and their insurers) are working to protect the integrity of their data and networks. But problems do occur, and insurance to compensate for lost or stolen data has become a small but rapidly-growing line of business. So far, terrorists have not attacked data or data networks as they have buildings, airplanes and trains, and people, but officials are on alert: in testimony before Congress on 10 February 2011, then CIA Director Leon Panetta called the threat of cyber terrorism “*the battleground for the future.*”¹³

And when all of this is overlaid with increasing frequency and severity of natural events—erupting volcanoes, tsunamis, earthquakes, flooding, tornadoes, hurricanes/typhoons, etc.—and a new appreciation for the need for higher levels of liquidity to cope with a catastrophic instability in the financial system that had appeared and could recur at any time, the general sense of vulnerability—but also the need for appropriate risk management and insurance solutions—rose markedly. Chart 12 shows this history.

Concluding comments

Perhaps one of the most insidious long-term consequences of the September 11 terrorist attacks is the effect it has had on the determination of economic and political priorities and, indirectly, its effect on long-term economic growth. From an economic perspective, it can be argued that the response to the terrorist attacks—and the threat of future attacks—has made the world worse off. Mueller and Stewart argue that the costs far outstrip the benefits and so conclude that much of the counter-terrorism spending is wasteful. They contend that September 11 has given rise to a chronic case of “probability neglect.” This happens when

*“... people’s attention is focused on the bad outcome itself, and they are inattentive to the fact that it is unlikely to occur.” Moreover, they are inclined to “demand a substantial governmental response—even if the magnitude of the risk does not warrant the response.”*¹⁴

I would add that this behaviour applies to businesses and non-profit organisations, as well. This leads to “*worst-case thinking*”, which

*... involves imagining the worst possible outcome and then acting as if it were a certainty. It substitutes imagination for thinking, speculation for risk analysis, and fear for reason. And it makes us more vulnerable to the effects of terrorism.”*¹⁵

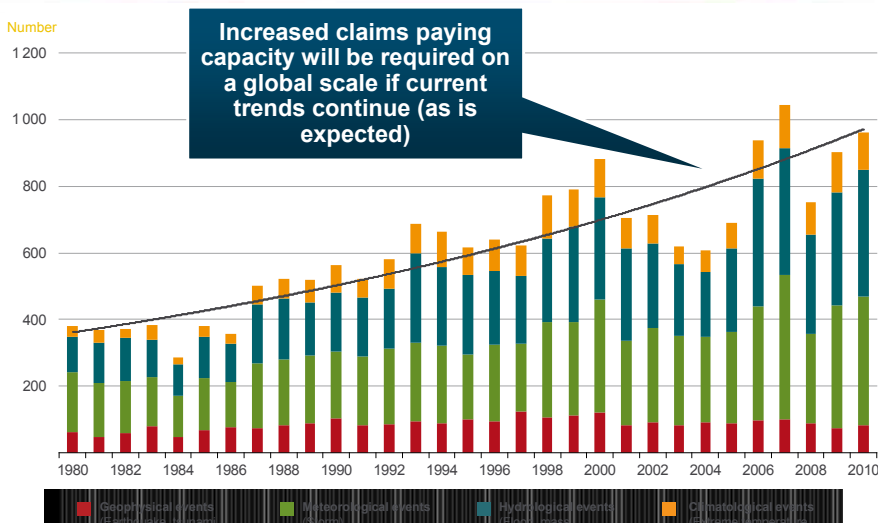
And so we spend money on un- or less-productive activities and short-change our future. Even so, we could (and, arguably, should) be prioritising resilience/mitigation—not only to combat the effects of terrorism, but also the effects of natural and man-made disasters (e.g., oil spills). Flynn argues that “*advancing resilience almost always provides a positive return on a relatively smaller investment [compared to “boosting the security*

¹³ Hartwig and Wilkinson (2011).

¹⁴ Mueller and Stewart (2011), quoting Cass Sunstein (2003).

¹⁵ Mueller and Stewart (2011), quoting Bruce Schneier (2010).

Chart 12. Natural catastrophes worldwide, 1980–2010 (number of events with trend)



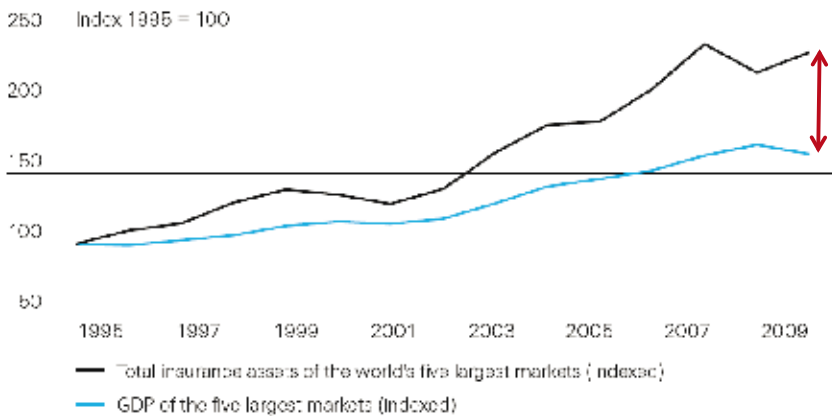
Source: Geo Risks Research, NatCatSERVICE

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apparatus”].¹⁶ And by lowering the likely severity of losses, resilience measures have the potential to lower insurance rates, as well.

Other economists tend to include the billions now spent annually on terrorism risk insurance among their lists of non-productive allocations of resources, but I disagree with that classification. Insurance contracts, and the premiums that finance them, support and

Chart 13. Growth of nominal insurance assets and GDP, 5 largest insurance markets*



The global financial crisis and recession have contributed to a widening gap between the growth of demand for insurance (as proxied by GDP) and the growth of its available supply (as proxied by insurer assets). This helps explain why insurance prices remain depressed on a global scale.

*The five largest insurance markets are the U.S., Japan, U.K., France and Germany. Includes life and non-life sectors. Source: Swiss Re, *sigma* no. 5, 2010.

facilitate investment in other productive resources; without that insurance, organisations would be less willing to make those commitments.

The post-September 11 decade has produced an insurance paradox: on the one hand, the world is surely a riskier place. In the U.S., for example, and just considering terrorism, the Federal Bureau of Investigation cites six terrorist attack attempts in 2009 and four in 2010. Insurers are willing to provide coverage for terrorism claims, but only if the U.S. government reinsurance facility, capping their exposure, remains in place.¹⁷ More broadly, however, especially for property-casualty insurance, the long-term (and continuing) softness in insurance prices and the massive growth in insurer capital (Chart 13) suggest that there is *less* risk.

In the capital markets, interest rates and inflation have generally stayed low since September 11, although many are worried that both will rise (some forecasting this because they expect an improving world economy, and others forecasting it because they expect heightened scarcities and uncertainties, including uncertainties related to terrorist acts, to be reflected in prices). Although higher interest rates would provide insurers with more investment income, they would also depress values of insurers' invested assets. This could prove troublesome at a time when regulators are generally calling for financial institutions to hold more capital.

Finally, toward the end of the post-September 11 decade the world discovered that many of its banks were less reliably sound than previously thought, but its insurers were, perhaps, even more solid than prior opinion would have expected. All P/C insurers and virtually all L/H insurers passed what can be thought of as an extreme stress test. The insurers' business model was essentially validated. Based on simple models of risk-bearing capacity, it is reasonable to claim that insurers are stronger and more capable than a decade ago to play their vital roles in supporting and growing the world's economies.

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How September 11 has changed the insurance industry

Fabrizio Ortolani, Lorenzo Savorelli and Paolo Zanghieri¹

1. Introduction

The September 11 attacks were a defining moment for the insurance industry. The sector was confronted with a totally new type of risk, with a potential for creating nearly unprecedented damages. The industry responded quickly and was able to devise new tools to face this risk. At the same time the reaction involved the forging of a new partnership between the state and the private sector. The aim of this article is to briefly sketch the issues terrorism brought about for the insurance industry, and its reaction (Section 2), and to track the developments of the last five years (Section 3). Section 4 concludes.

2. After September 11: new risks, new models, and new institutions

The impact on the insurance industry: Is terrorism insurable?

Table 1. The 10 most costly insurance losses 1970-2010

Insured Loss*	Victims	Date	Event	Country
72302	1836	25/08/2005	Hurricane Katrina	US et al.
24870	43	23/08/1992	Hurricane Andrew	US, Bahamas
23131	2982	11/09/2001	Terror attack on WTC & Pentagon	US
20601	61	17/01/1994	Northridge earthquake	US
20483	136	06/09/2008	Hurricane Ike	US et al.
14876	124	02/09/2004	Hurricane Ivan	US et al.
14028	35	19/10/2005	Hurricane Wilma	US et al.
11268	34	20/09/2005	Hurricane Rita	US et al.
9295	24	11/08/2004	Hurricane Charley	US et al.
9041	51	27/09/1991	Typhoon Mireille	Japan

*USD m. in 2010 prices. Property and Business interruption. Excluding Life and Liability Losses.

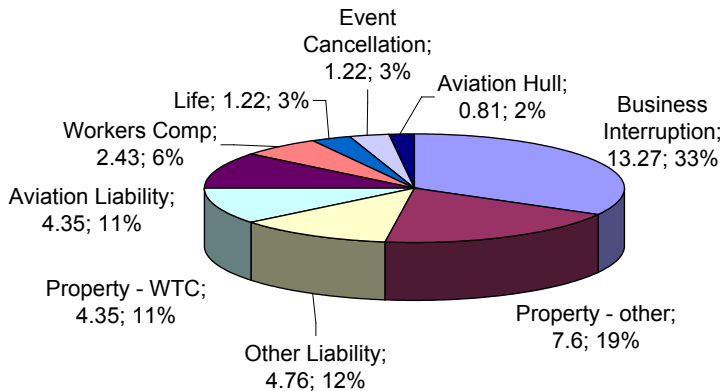
Source: Swiss Re.

The September 11 attacks caused the third largest loss in the history of insurance (Swiss Re, 2011): claims totalled US\$23.1 billion, at 2010 prices, only slightly below hurricane Andrew and far above several other natural or man made catastrophes (see Table 1).

¹ Assicurazioni Generali, Research and Development. Corresponding Author: Paolo Zanghieri, Assicurazioni Generali, Research and Development, Piazza Duca degli Abruzzi 2, 34132 Trieste (Italy) email: paolo_zanghieri@generali.com

The attacks, and in particular the increased terrorism risk they implied, threatened the stability of the insurance industry not just because of the sheer size of the insured losses, but also because multiple lines of business were affected. As Chart 1 shows, losses related to the actual destruction of the buildings were just 30 per cent of the total amount paid out by insurers. Insurers were put in the unusual situation of having to simultaneously face risks that were thought to be uncorrelated. Moreover and most importantly, the vast increase in terrorism risk made profound changes in underwriting policies inevitable.

Chart 1. September 11 insured losses



Source: Insurance Information Institute (2010).

The unprecedented scale and mode of attack led to a surge in the uncertainty about the likelihood and size of new attacks, and about the financial ability of the industry to withstand them (Kunreuther and Michel-Kerjan, 2004). As a result, insurance companies quickly excluded terrorism coverage from most of their contracts and, when not possible, raised rates to unprecedented levels. For example, as reported by Jaffee and Russel (2007), before September 11 the Chicago airport was able to purchase US\$750 million worth of terrorism insurance coverage at an annual premium of US\$125,000. Afterwards, coverage was reduced to US\$150 million and the premium skyrocketed to US\$6.9 million.

At a more fundamental level, several market participants started to wonder whether terrorism risk could be insured at all. In the aftermath of September 11, research on this issue flourished.² Its main focus was to identify the differences, relevant to the insurance industry, between terrorism and natural catastrophes. They turned out to be rather significant in what concerns both the estimation of the probability and extent of the losses and the setting of an adequate premium for each class of customers.

The probability of an attack on a specific site within a given timeframe is influenced by the interplay of several factors, in particular:

- **Terrorist strategies:** the September 11 attack revealed a strategy based on hitting symbolic targets and creating as much damage and victims as possible, whereas in the past attacks were more narrowly focused on political figures or specific economic interests.

² See for example Cummins and Doherty (2002), Cluff and Jonkman (2002) and the reviews by Kunreuther and Michel-Kerjan (2004) and Kunreuther, Michel-Kerjan and Porter (2003).

- **Government policy choices**, in the form of prevention measures and counterterrorism: reinforcing security measures around a site considered at high risk may reduce the probability of it being actually attacked, but may increase the riskiness of another location. Of course other dimensions of government activity, such as foreign policy or the treatment of ethnic/religious minorities can play a role in changing the risk.
- **Risk management policies by the private sector:** actions taken to reduce the risk of a target may lead to an increase in risk elsewhere, as in the case of public risk management policies.

The interplay between terrorists and governments generates what is called *dynamic uncertainty* about the likelihood of an attack. Unlike natural catastrophes, historical information may not be particularly useful and can be even misleading.³

Estimating the premium to be charged for terrorism risk presents even bigger challenges, as it entails dealing with large information asymmetries. These are likely to arise due to several factors:

- **Fear of capital shortages in case of major events:** given the scale of the possible losses, in the aftermath of a large attack, reinsurers and capital markets may be unwilling to provide further coverage to insurance companies responsible for covering the assets hit (or at risk of being targeted) by a terrorist action, fearing that another attack would lead them to bankruptcy. This could lead, as it happened after September 11, to a sharp increase in premiums and a fall in the availability of coverage. This problem is common also in traditional natural catastrophe insurance, but the virtual unpredictability of terrorism attacks and the change in risk assessment to be expected after an attack increases uncertainty dramatically.
- **Asymmetric information:** while information useful to predict natural catastrophes is widely shared, governments do not disclose, for security reasons, several types of data which could be used to set premium rates. In the extreme, those willing to buy protection (for example the government for its buildings, or a multinational firm dealing with governments targeted by terrorists) might end up being much more informed than the insurer which is supposed to supply it.
- **Difficulty to cover “wilful attacks”:** unlike natural accidents, terrorist attacks are not “acts of God”, but are planned according to a strategy. Therefore, at the limit terrorist may exploit the existing underwriting mechanism to add financial disruption to the physical damages provoked by the attacks.
- **Interdependencies:** losses to one site can be caused by weak security measures elsewhere (OECD, 2005). For example, security failures at the Logan Airport in Boston were instrumental in the success of the attack on the WTC towers in New York. Therefore it becomes really challenging to pinpoint responsibility and charge premiums accordingly.
- **Accumulation of risks:** as September 11 shows, terrorist attacks can simultaneously provoke huge losses across different lines of business, whose claims are weakly correlated in normal conditions. This can lead to difficulties in setting a prudent level of reserves and in calculating a safe level of premiums.

³ This is in some sense akin to the criticism addressed to the statistical models used to forecast financial crises, which normally deliver an accurate (but fairly useless) prediction of the crisis that just happened, but often fail to predict the next one.

Is it possible to model terrorism risk?

Terrorist attacks, like natural catastrophes, are extreme events, which are events with a low probability of occurrence, but possibly causing very high losses. Unfortunately, given the peculiar characteristics of the terrorism risk, described in the former section, insurers can not rely on their traditional tools in assessing this sort of risk, as it is impossible to build a probability distribution of the possible losses related to terrorism. In fact, as noted by Kunreuther, Michel-Kerjan and Porter (2003), the lack of historical data, and their possibly misleading nature, makes it really hard to estimate the frequency of a terrorist attack and the amount of losses that it may likely cause. Therefore, it is not possible, with conventional methods, to build a loss exceedance probability curve and, thence, set a premium that would make the insurer willing to offer coverage and at the same time meet customer demand. Strong differences thus arise with the natural catastrophe case: as Einstein said, “*Nature is subtle, but not malicious*” and therefore natural hazards can be modelled with reasonable confidence, but as Woo (2008) points out, terrorists are both subtle and malicious. To overcome this impasse therefore, an ideal modelling framework would add a human dimension to the traditional techniques borrowed from statistics, engineering and physics.

Some attempts at assessing risk, mainly used by counter-terrorism agencies, model terrorism groups as networks and use the interaction between the nodes as a forecasting tool. After September 11 several attacks have been thwarted thanks to the information gathered by tracking money transfers, credit card information, plane tickets and so on (Woo, 2002). However, and crucially for the insurance industry, the information gathered by counter-terrorism agencies is seldom shared with the private sector.

Major (2002) illustrates an example of how, theoretically, game theory could be employed. He models the probability of a target being attacked as the solution of a zero sum game between a terrorist group and the government.⁴ The model expresses the probability of detection of an attack and the likelihood of the technical success of an undetected attack as functions of the value of the target and the total resources available to terrorists and the government. However, translating the insights of this model into information useful to build and price insurance products requires, as the same author points out, a lot of strongly simplifying assumptions on terrorists’ actual behaviour and reliable information on their resources, as well as data on the resources committed by the government against protection from terrorism.

Many specialised risk modellers rely on expert judgement (see for example Risk Management Solutions, 2003). Periodically, the opinion of a panel of experts is elicited through a structured process. The process uses contextual information on past terrorist trends (for example the mentions of a particular target in extremist media), and the assessment of the logistical burden of different types of attacks to estimate the overall probability of an action and the relative likelihoods of attacks on specific sites, as well as the probability of the selection of a specific type of weapon.

⁴ In the Game theory language a “solution” is the final outcome of the players’ joint decisions (for example the price of a good sold by firms colluding in a cartel, or the decision of a country to invade another). A zero sum game, is a particular game where a participant’s gain or loss is exactly balanced by the losses or gains of the other participant(s).

Estimates of the possible damages from a terrorist attack are derived from a scenario analysis which combines different assumptions on the kind of attack and on the type of weapon used.

In such an analysis three components are normally considered (see Risk Management Solutions, 2003, for more details): 1) the weapons used, 2) the target types and characteristics, and 3) people exposure. The effect of the use of a specific weapon is analysed in terms of type of weapon, delivery method and potential harm to people and property. For example it is possible to assess the damages from the blast pressure waves and debris impact over an area of tens of meters around the site where a 250 kg bomb placed in a car is detonated. Potential targets are then divided according to their type (e.g. government buildings, hotels, foreign consulates, passenger trains) in order to assess their vulnerability and the risk related to an attack on them. Potential target characteristics such as a building's number of floors, age and construction types are then considered. Finally, exposure is related to the damages to population. For each possible target an estimation of the number of people, tier age structure and occupational status is calculated.

The model then combines all these estimates, creating a very large range of scenarios, providing estimates of casualties and property damages. The results can be used for deterministic ("what if") analysis. For example it is possible to estimate the damages provoked by the release of 1 kg of anthrax in the London Underground on a Wednesday morning. These results can be applied to an insurer's portfolio, to obtain an assessment of the total losses due to a specific attack (for more details see AIR Worldwide Corporation, 2004).

Some models blend the probabilistic structure gathered from the expert panel with the results of the scenario analysis, providing a full-fledged quantification of risk that can be used by the industry⁵ to set premiums.

The role of the government

The very features that make terrorism risk so hard to model put into question the possibility of the private sector to provide adequate coverage without putting at risk its own financial stability, thus hinting at the need for some form of public intervention. Immediately after the attacks, a voluminous discussion has emerged on the pros and cons of government involvement in the provision of terrorism insurance. Describing in detail the arguments in favour or against public intervention in terrorism insurance is beyond the scope of this article.⁶ In what follows we just sketch the main pros and cons.

First of all, it can be argued that the government should step in to provide some coverage because, as shown in the section "The impact on the insurance industry" above, its policies may influence the choice of targets and the likelihood of attacks. Moreover, government's decision not to disclose security information may prevent the private sector from correctly pricing risk. Finally, in case of large scale attacks, the government should

⁵ See for example the model built by Risk Management Solutions, described in Risk Management Solutions (2003). In a subsequent report (Risk Management Solutions, 2008), Risk Management Solutions compares the attacks occurred between 2001 and 2007 with the prediction of the model, claiming that it was quite accurate.

⁶ For a review of the arguments in favour of public intervention see for example Lakdawalla and Zanjani (2005), Barker (2003) and Brown, Kroszner and Jenn (2002). The arguments for a purely market solution are clearly laid out in Jaffee and Russell (2007).

take the role of the “insurer of last resort” as the private sector may not have the financial capacity to sustain the losses of a mega terrorist attack.

However, some contend it is just a matter of time and, in due course the insurance sector will be prepared to handle this risk as it already does with natural catastrophes. A large and permanent public intervention which provides implicit and explicit subsidies would result in premiums set below the optimal level and in lax claims management by the private sector.

This discussion was instrumental in setting the framework for the Public-Private Partnerships (PPP) that were set up in the aftermath of September 11, where the state provides a guarantee, normally for the highest layers of risk, on a (theoretically) temporary basis. These arrangements give the insurance industry the possibility to provide coverage at reasonable prices during the process in which it learns how to cope with terrorism risk and build an adequate capital buffer. At the same time, these arrangements ensure that claims are paid according to clear rules and set limits to the public sector commitment. Without any precommitment, political pressure may induce the government to compensate all victims, regardless of their precautionary efforts or the insurance coverage taken out.

In the remainder of this section we will briefly describe the arrangements put in place in the United Kingdom, France, Germany and the United States.⁷

United Kingdom

The U.K. was one of the first countries to address the terrorism risk coverage issue with a public/private scheme, by establishing in 1993 a mutual reinsurance organisation, Pool Re, to respond to the domestic terrorism perpetrated by the IRA. After the September 11 attacks its workings have been improved, extending the coverage to an “all risks” basis, with the sole exclusion of acts of war and cyber-terrorism. Pool Re is formed by the main primary insurers and reinsurance companies operating in the U.K., whilst the government acts as the insurer of last resort. Participation in the pool is voluntary. For each member of the pool an individual loss retention level is determined, depending on its terrorism insurance portfolio’s size. The part of the claims exceeding this threshold would be recouped from the pool. Should the reserves not suffice, Pool Re would draw funds from the U.K. Treasury for the remaining part. No limits are set to the amount of the funds to be drawn, but Pool Re must pay 10 per cent of its collected premiums to the Government for this coverage and it is also required to repay with its future income all the funds drawn. Coverage is limited to commercial property located in England, Wales and Scotland.

France

Terrorism insurance coverage is mandatory in France, and insurers providing it may be reinsured by GAREAT (Gestion de l’assurance et de la réassurance des risques attentats et actes de terrorisme), a co-reinsurance pool. It is divided into two sections, “Large Risks”, for insured sums of €20 million or more, and “Small and Medium-sized Risks”, for sums up to €20 million. The participation in the Large Risk scheme is mandatory for the insurer members of FFSA and GEMA,⁸ whilst it is voluntary in the case of small risks.

⁷ A more detailed discussion of the plans set up in the U.S., Germany and France can be found in Michel-Kerjan and Pedell (2005), which however does not account for the most recent changes. OECD (2010) provides a description of the PPPs set up in industrialised countries, while Guy Carpenter (2009) covers also some developing countries.

⁸ Fédération française des sociétés d’assurances and Groupement des entreprises mutuelles d’assurances, the two trade bodies.

The programme covers all the property damage losses suffered on the French territory regardless of the country in which the act of terrorism is perpetrated. Both schemes are based on an annual aggregate loss excess programme which presents several layers of reinsurance. For the Large Risk scheme, that first layer is set at €400 million, with the risks shared between all the members of the pool according to their share of ceded business. The other six layers up to €2 billion are covered by reinsurers and some insurer members of GAREAT, whilst unlimited coverage for sums exceeding this quota is provided by the state via the Caisse centrale de réassurance. Premiums paid by the insurers differ according to the premiums paid in the original policy, and may be up to 24 per cent of the original underlying premium in case of nuclear risks.

Germany

Terrorism insurance coverage is not mandatory in Germany. In the aftermath of the September 11 attack, a private insurance company specialising in terrorism insurance, EXTREMUS AG, was created by the German insurance industry with the support of the Federal Government. It has a two-layer structure for an overall capacity capped at €10 billion. EXTREMUS provides coverage up to €2 billion, and the remaining €8 billion are provided by the State. Reimbursement is limited to an aggregate annual maximum of €1.5 billion per policyholder. EXTREMUS covers exclusively damage to industrial plants and buildings including their contents as well as business interruption for insured sums of more than €25 million.⁹ The terrorist attack must be committed in Germany in order for the coverage to be effective. War, warlike events, lootings, nuclear, chemical and biological attacks and cyber-terrorism are excluded. Since 2008, premiums paid by policyholders are calculated on the basis of the specific risk and vulnerability of the area where the building (or plant) is located. Currently, the government receives 12.8 per cent of the premiums collected by EXTREMUS, an amount that will rise to 13.5 per cent in 2012.

United States

Terrorism insurance in the United States is regulated by the Terrorism Risk Insurance Act (TRIA). With the exception of some specific cases (i.e. workers' compensation), terrorism insurance is not mandatory. Nonetheless, all insurance companies are obliged to offer terrorism cover in their commercial P&C policies,¹⁰ but clients are allowed to turn the offer down. In order for the scheme to be applied, the event must be certified by the Treasury Secretary, the Secretary of State and the Attorney General as an act of terrorism, and losses must be higher than US\$100 million. Since the 2007 revision, domestic terrorism is also included. When these conditions are met, the programme is triggered, and coverage applied according to two different layers. The first layer is provided by the insurers and corresponds to a deductible equal to 20 per cent of their direct P&C earned premiums collected in the preceding year. The second layer has a cap of US\$100 billion. Eighty-five per cent of it is covered by the government, whilst the remaining 15 per cent of the losses is paid by the insurers. There is a mandatory recoupment of federal payments up to US\$27.5 billion, above that threshold the recoupment is discretionary. As opposed to the other countries' programmes, the federal government does not collect any premium for its coverage.

⁹ Coverage of up to US\$25 million is usually included in commercial P&C policies.

¹⁰ With the exclusion of Commercial Auto, Burglary and Theft, Surety, Professional Liability and Farm Owners Multiple Perils Insurance.

Table 2. The 20 worst terrorist acts by insured property losses (2010 US\$)

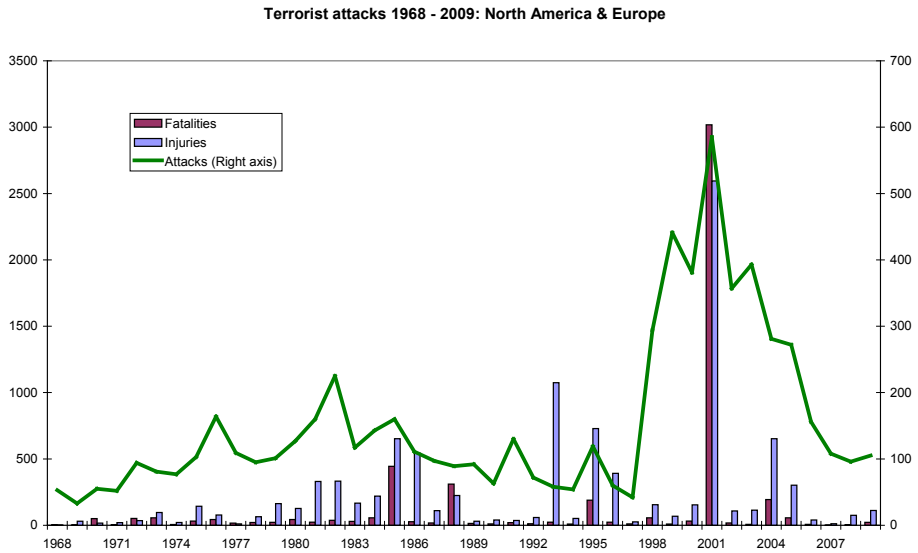
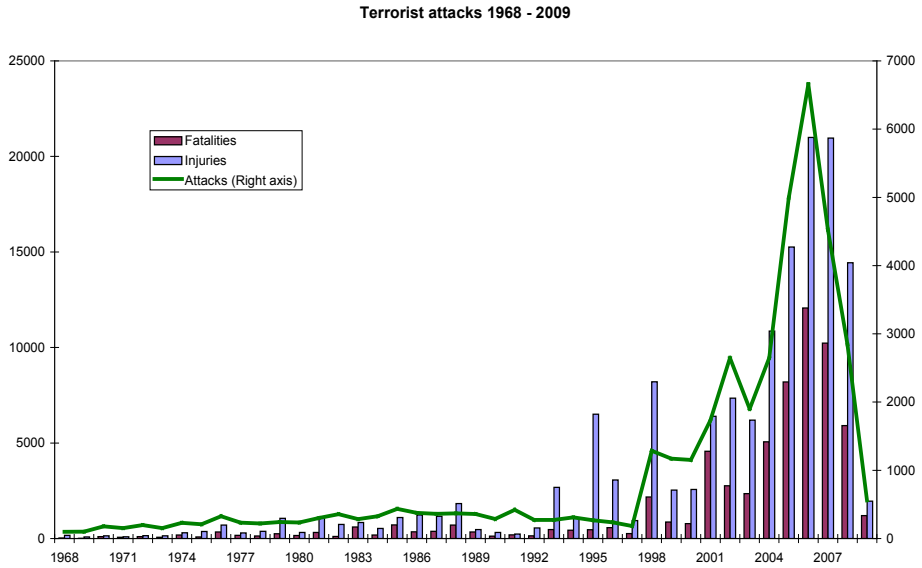
Rank	Date	Country	Location	Event	Insured Prop. Loss (1)	Fatalities
1	September 11, 2001	United States	New York, Washington DC, Pennsylvania	Hijacked airliners crash into World Trade Center and Pentagon	\$23,140	2,982
2	April 24, 1993	United Kingdom	London	Bomb explodes near NatWest tower in the financial district	1,117	1
3	June 15, 1996	United Kingdom	Manchester	Irish Republican Army (IRA) car bomb explodes near shopping mall	917	0
4	April 10, 1992	United Kingdom	London	Bomb explodes in financial district	826	3
5	February 26, 1993	United States	New York	Bomb explodes in garage of World Trade Center	770	6
6	July 24, 2001	Sri Lanka	Colombo	Rebels destroy 3 airliners, 8 military aircraft and heavily damage 3 civilian aircraft	491	20
7	February 9, 1996	United Kingdom	London	IRA bomb explodes in South Key Docklands	319	2
8	June 23, 1985	North Atlantic	Irish Sea	Bomb explodes on board of an Air India Boeing 747	199	329
9	April 19, 1995	United States	Oklahoma City	Truck bomb crashes into government building	179	166
10	September 12, 1970	Jordan	Zerqa, Dawson's Field (disused RAF airstrip in desert)	Hijacked Swissair DC-8, TWA Boeing 707, BOAC VC-10 dynamited on ground	157	0
11	September 6, 1970	Egypt	Cairo	Hijacked PanAm B-747 dynamited on ground	136	0
12	April 11, 1992	United Kingdom	London	Bomb explodes in financial district	118	0
13	November 26, 2008	India	Mumbai	Attack on two hotels; Jewish center	104	172
14	March 27, 1993	Germany	Weierstadt	Bomb attack on a newly built, still unoccupied prison	87	0
15	December 30, 2006	Spain	Madrid	Bomb explodes in car garage at Barajas Airport	71	2
16	December 21, 1988	United Kingdom	Lockerbie	Bomb explodes on board of a PanAm Boeing 747	70	270
17	July 25, 1983	Sri Lanka		Riot	58	0
18	July 7, 2005	United Kingdom	London	Four bombs explode during rush hour in a tube and bus	58	52
19	November 23, 1996	Comoros	Indian Ocean	Hijacked Ethiopian Airlines Boeing 767-260 ditched at sea	56	127
20	March 17, 1992	Argentina	Buenos Aires	Bomb attack on Israel's embassy in Buenos Aires	47	24

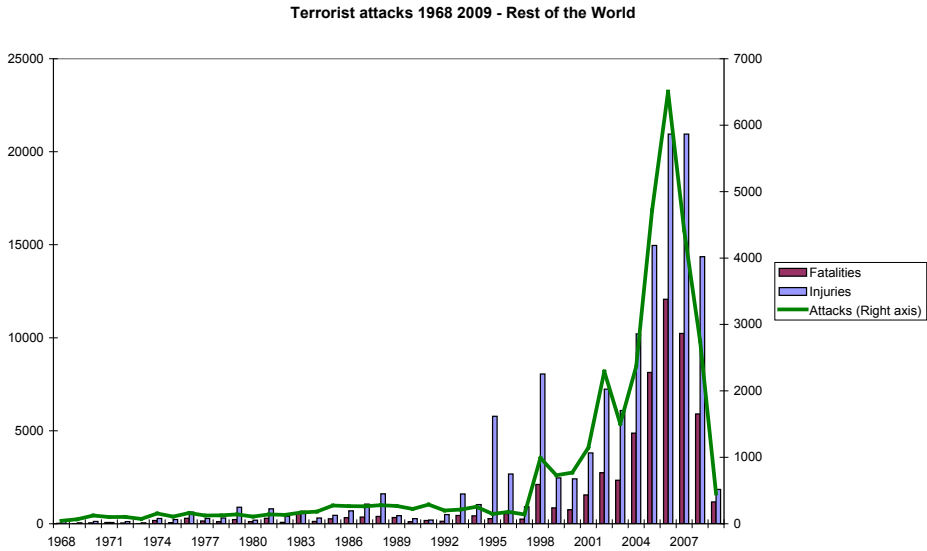
(1) Includes bodily injury and aviation hull losses.

Source: Swiss Re. Updated to 2010 dollars by the Insurance Information Institute using the U.S. Bureau of Labor Statistics CPI Inflation Calculator.

Source: Insurance Information Institute. Available at http://www.iii.org/facts_statistics/terrorism.html

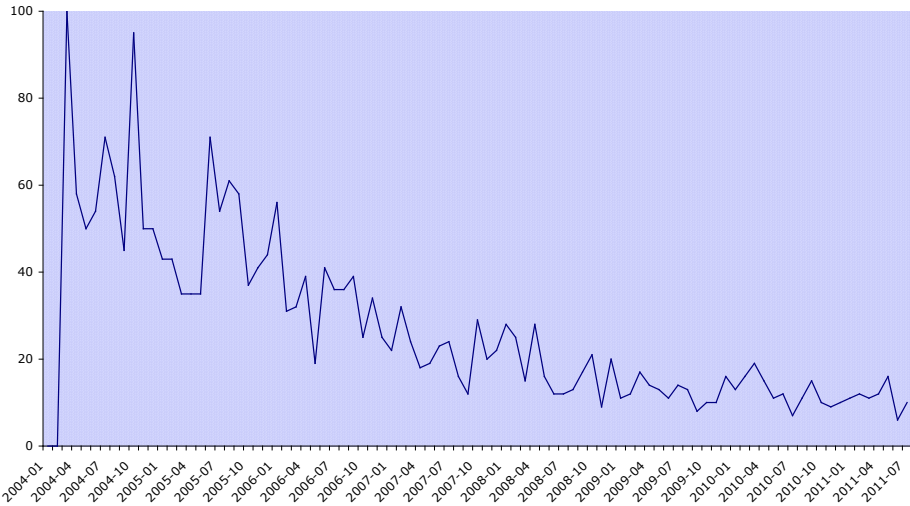
Chart 2. Terrorist attacks 1968-2009





Source: RAND Database of Worldwide Terrorism Incidents.

Chart 3. Number of hits for a Google search for “Terrorism Insurance” (in % of highest value)



Source: Google Insights.

3. The outlook for terrorism insurance

What is the state of play today and what is the outlook for terrorism insurance? In what follows we will analyse what has changed in the perception of the risk by the private sector and what is the state of PPPs.

Risk perception by the private sector

Luckily the September 11 attacks have so far remained unparalleled. All other major terrorism acts have been far less costly in terms of lives and material damages (see Table 2).

However, as underscored by the recent events in Oslo,¹¹ the absence of significant large scale attacks does not mean that terrorism risk has receded, or that its targets and modes have become easier to predict. Chart 2 shows the number of terrorist attacks between 1970 and 2010, split by geographical location. It is clear that since the “War on Terror” has been launched after September 11, terrorist activity has soared to levels not seen before.

Every two years, the Centre for the Study of Financial Innovation publishes a survey of industry participants on the main risks faced by the industry.¹² In the 2011 edition terrorism ranked 23rd out of 26 possible risks. According to the respondents, the lack of significant attacks over the last few years and the existence of government support and a higher confidence in the capability of the industry are behind this apparent lack of concern. Chart 3, which shows the number of hits of a Google search for “terrorism insurance” between 2004, the first available year, to July 2011, seems to tell a similar story of progressively fading interest in this specific form of insurance while the industry equips itself in order to handle the risk.

However, a lack of public interest does not mean unpreparedness. The only available evidence on the diffusion of terrorism insurance comes from a few surveys conducted by leading brokers and seems to confirm quite a strong awareness, at least among U.S. firms. According to Marsh, in 2009, 61 per cent of U.S. companies purchased insurance coverage (Marsh, 2010). The take up rate (share of companies purchasing coverage) was 27 per cent in 2003, in the wake of the TRIA enactment and then rose rapidly to 58 per cent in 2005 and remained stable at that level; it was 61 per cent in 2009. Reports by other brokers such as Aon and Guy Carpenter confirm these findings.

Terrorism insurance penetration in Germany appears to be relatively low for large risks, even though data are not directly comparable. According to EXTREMUS (quoted in Marsh, 2010), in 2009, less than 50 per cent of all properties exposed to domestic terror were covered. Some of the features of EXTREMUS, such as the fact that it covers only risks located in Germany (leaving foreign subsidiaries of German multinationals uncovered) and the exclusion of nuclear, bacteriological and chemical risks, may hamper the diffusion of this coverage. However, the reform enacted in 2008, which allows to differentiate

¹¹ On the 22nd of July 2011, a Norwegian man perpetrated a twin-attack that killed around 70 persons, injured many others, most of them very young, and caused damages to property and public buildings. By shocking the world for the cruelty of these actions, the attack has also raised the concern that a new threat is re-emerging on the domestic level, underscoring the fact that the nature of terrorism is constantly evolving. (Guy Carpenter, 2011b).

¹² *Insurance Banana Skins*, which can be downloaded at <http://www.pwc.com/gx/en/insurance/insurance-banana-skins-2009.jhtml>

among premium rates according to location and vulnerability has arguably increased demand more recently. Unfortunately similar data are not available for Europe at large or developing countries.

Concerning prices, Michel-Kerjan and Pedell (2007) find quite large differences between the U.S. and Germany. Depending on the size of firms and the definition of insurance price chosen (the ratio between premium and insured value or between premium and cover limit), the cost of comparable coverage in Germany is between 30 per cent and 300 per cent higher than in the U.S. Interestingly, prices charged to financial companies are broadly similar. The large differences are due to the fact that government backstop is free of charge in the U.S., as opposed to Germany, where, in addition, the tax rate on premiums is higher. Evidence gathered from Marsh shows that premium rates, for the risks included in TRIA have continued to decline, thanks to the absence of major losses. Between 2008 and 2009 the median premium rate was down from US\$37 per million to US\$25 per million.

The state of public-private partnerships

Most of the programmes put in place after September 11 have subsequently been renewed, but not without difficulties, as shown by the discussion sparked by the proposed shrinkage of TRIA in 2009.¹³ The large budget problems faced by governments after the 2007-2008 financial crisis are likely to speed up the proposed scaling down of several programmes which involve subsidies.

However, the private market for terrorism has developed in terms of overall capacity: according to Marsh (2010), before the introduction of TRIA, global capacity was around US\$100 million, whereas by 2009 the U.S. industry was able to provide up to US\$3.8 billion. The increase in take-up rates and decline in premium rates signalled by brokers (Guy Carpenter, 2010, and Marsh, 2010) indicates that good progress has been made. This argument may be used to lead to TRIA to lapse at the next renewal date, in 2014.

However too quick a reduction of public funding and backing may leave the insurance sector without the financial capacity to withstand another large scale terrorist attack, even though the large exclusions put in place after September 11 have substantially reduced the industry's vulnerability to large scale attacks. At the same time financial markets seem unwilling to take up this risk. While the market for bonds aimed at providing cover for natural catastrophes continued to flourish despite the global financial crisis¹⁴, none of these instruments has been so far specifically adapted to terrorism, given the difficulties that even more skilled institutions like insurers and reinsurers have in dealing with this kind of risk.

Moreover, the elusive nature of terrorism risk may make "learning" by insurance company too slow or too weak to be effective in providing protection by the private sector alone. Therefore it can be argued that some form of government guarantee should be made permanent.

In Europe, Government support shows no sign of decline. OECD (2010) documents an increased awareness by European governments, despite the absence of large scale attacks in the second half of the decade. The largest programmes, such as GAREAT and the

¹³ See Insurance Information Institute (2010).

¹⁴ According to Guy Carpenter (2011a) the first quarter of 2011 was the most active first quarter in the history of the catastrophe bond market in terms of new issuance.

German government's backing of EXTREMUS have been extended. Other European countries have set up PPPs.¹⁵ Italy remains the only exception, as the government is still not involved in any partnership with the industry, leaving large terrorist attacks virtually without any coverage.

However, it is worth recalling that over two thirds of September 11 losses were ultimately paid for by European insurers and reinsurers (Swiss Re, 2002) and therefore the European industry might be severely affected by a closure or significant scaling down of TRIA.

4. Conclusions

The nature of the September 11 attacks posed an unprecedented challenge to the insurance industry. In this article we tried to summarise the terms of this challenge and how the sector responded to it. On the one hand, significant advances were made in the modelling of expected losses. However, the very nature of terrorism and the strong influence that Government policy and strategic behaviour by terrorists have in determining the probability of an attack have not yet allowed for a satisfactory modelling of risk. As a consequence, terrorism cannot be handled by the private sector alone. The years immediately following the attacks saw the build up of PPPs, which allow the provision of cover to be shared efficiently between governments and the insurance industry.

These partnerships have proved instrumental to the diffusion of terrorist insurance: the little evidence available shows that take up rates increased dramatically, and at the same time the cost of coverage and in particular the uncertainty for the private sector was substantially reduced.

The insurance industry, according to surveys, does not consider terrorism as one of the most immediate dangers for the sector, but this does not mean that it is unprepared. The financial capability has increased dramatically and the support provided by Governments has not been jeopardised so far by the need to rein in public expenditure.

However, this cannot leave room for complacency. The recent havoc brought to Norway has highlighted once more how unpredictable the sources of terrorist risks can be.

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September 11, ten years on— A reinsurance perspective

Peter Buetikofer and Kai-Uwe Schanz¹

The reinsurance industry's immediate response

The devastating attack on the World Trade Center on 11 September 2001 left the world in a state of shock. An almost universal sense of uncertainty also threatened to paralyse the world's financial markets and economies. First loss estimates released a few days after the event put insured losses at above US\$50 billion, a staggering and unprecedented loss amount in the history of insurance. At the same time, the U.S./Caribbean hurricane season was far from over, adding to concerns over the loss absorption capacity of the global insurance and reinsurance system. On top of all these challenges, financial markets plunged sharply in the immediate aftermath of the attack, causing a double whammy of major insurance and investment losses.

Against this backdrop, many reinsurers immediately excluded terrorism from coverage. Others, such as Swiss Re, adopted new and refined methods for risk and exposure control, allowing for a more accurate aggregation of exposure limits for individual risks. Thereby, reinsurers responded to the fact that, in contrast to Hurricane Andrew, the destruction of the World Trade Center did affect a multitude of lines of business, including commercial property, business interruption, workers' compensation, life, health, disability, aviation and general liability.

An acid test of the global reinsurance system's efficiency and resilience

The impact of September 11 on the global reinsurance industry came as much from the nature of the act as from its magnitude. Even though international terrorism, in which perpetrators act across borders and beyond national jurisdictions, was not a new threat, coordinated terrorist attacks of such massive proportions were not anticipated in any catastrophe scenario. The industry, therefore, was faced with an "unknown unknown" as opposed to "known unknowns" such as earthquakes and hurricanes for which loss scenario estimations are established and regularly reviewed based on sophisticated stochastic models.

Despite the totally unexpected nature of September 11, the global reinsurance industry was up to the challenge and paid all claims arising from what was believed to be the

¹ Peter Buetikofer, Managing Director, Head of Property Center, Swiss Re and Kai-Uwe Schanz, Special Advisor, Strategic Research, The Geneva Association.

costliest insured event on record by then.² The worldwide system of risk transfer and diversification through reinsurance passed this acid test successfully: more than 60 per cent of total claims were paid by international players, in particular European reinsurers. The resilience of the global reinsurance industry was, of course, helped by the rapid recovery of financial markets and the fact that actual insured losses ultimately turned out to be smaller than initially feared. Also, depleted industry capital was quickly replenished, not least by the “Bermuda Class of 2001” (for example Arch, AXIS, Allied World, Endurance and Montpelier Re) which captured the opportunity to enter the marketplace as rates surged across a broad spectrum of lines of business (similar to companies such as PartnerRe and RenaissanceRe which were established in the aftermath of Hurricane Andrew when Property catastrophe rates rose sharply).

The speed at which the global reinsurance industry’s capital base was restored after September 11 took many market participants by surprise and limited incumbent players’ scope for recouping losses. Accordingly, established reinsurers further intensified their efforts to adopt a more flexible business model based on anti-cyclical market behaviour (“cycle management”), e.g. the willingness to reduce market share in soft market phases.

A challenge to the traditional notion of insurability³

Prior to September 11 terrorism cover was included in most fire insurance policies, except for countries with a well-known domestic threat of terrorist attacks, notably the U.K. and Spain. The new dimension of September 11, however, dramatically highlighted the fundamental challenge the phenomenon of terrorism presents to the most elementary criteria for the insurability of risks:⁴

- The probability and severity of losses must be quantifiable to properly assess a risk and determine the price to cover it. In the area of terrorism, available data and statistics from the past are of limited use when it comes to predicting the scale, nature and location of future strikes.
- The risk must be shared and diversified within a broader risk community. In the context of terrorism this mutuality is difficult to achieve as terrorist hazard exposure is spread highly unevenly, being concentrated on “suitable targets” like very populated areas or landmark risks.
- For private insurers, it must be commercially feasible to write insurance business profitably over the long run by charging a premium commensurate with the risk. The obvious difficulties in quantifying terrorism risk suggest that the economic rationale for writing this business might be doubtful in as much as policyholders (and policymakers) are not prepared to accept premium levels allowing for sufficient safety margins.

These concerns remain largely valid ten years after the event. However, based on accumulation models for large risks, reinsurers’ ability to assess the severity of potential terrorist strikes has improved. At the same time, estimating the frequency of such events

² Total insured losses ultimately amounted to approximately US\$23 billion. This compares with US\$72 billion for Hurricane Katrina in 2005, an estimated US\$30 billion for the Tohoku earthquake and tsunami in 2011 and US\$25 billion for Hurricane Andrew in 1992 (see Swiss Re, *sigma* no. 1/2011).

³ The subsequent sections draw on Swiss Re (2002) and review this initial assessment from the perspective of 2011.

⁴ See Berliner (1982) for a pioneering and comprehensive discussion of the notion of insurability.

continues to be a challenge, even though qualitative scenario building has progressed significantly. All in all, terrorism remains at the border zone of private insurance solutions.

A catalyst to enhanced public-private partnerships

As was mentioned before, in view of these many obstacles to insurability, most reinsurers'—and consequently insurers'—immediate response to September 11 was to drastically reduce their exposure to terrorism risk, or even stop covering it. Instead, governments were called upon to step in. However, insurers and reinsurers quickly realised that a wholesale withdrawal from terrorism coverage was neither a commercial imperative nor compatible with the industry's claim of being a relevant and reliable absorber of personal and corporate risk. The challenge was to define a framework under which, over time, terrorism risk would be privately insurable to a certain extent, avoiding a complete crowding-out of private solutions.

Drawing on specific experience with government-sponsored schemes providing coverage for terrorism risk⁵ new and innovative forms of public-private partnerships emerged. Most of these schemes are based on two main principles: first, given the specific nature of terrorism risk and obvious limits to insurability, governments impose compulsory insurance requirements in order to ensure a minimum degree of solidarity. "Risk mutualisation" is a prerequisite to insurability, in the absence of which private insurance and reinsurance capacity is unlikely to be provided. If, for example, all property risks are automatically covered against terrorism it is much more likely that affordable cover for highly exposed landmark risks will be available through private insurance and reinsurance. If everyone contributes, the required additional premium rate will remain small and digestible, and significant funds will be accumulated to cover peak risks.

Second, all stakeholders (insured parties, insurers, reinsurers, governments) agree on a balanced scheme for loss sharing. Insured parties carry an adequate deductible. Insurers retain a certain portion of the risk, ensuring that they have "some skin in the game", are able to manage the risk and pay out their share of losses. The remaining premium flows into a pool which may be privately or publicly organised. The pool assumes losses in higher layers and is, itself, reinsured on a non-proportional basis by private reinsurers. The national government acts as a "reinsurer of last resort" if the pool faces insolvency or a certain threshold of losses is exceeded.

After September 11, new terrorism insurance programmes were developed in a number of countries, for example in the U.S., Germany and France, the world's largest, second largest and fifth largest Property & Casualty insurance markets, respectively. These three schemes are all based on government backup. Government involvement, initially, was limited to a few years.⁶ However, the schemes display significant differences as far as exclusions, compulsory insurance requirements and the government's exit strategy are concerned.

⁵ The U.K.'s Pool Re is widely considered the most prominent example. As a consequence of the IRA terrorist attacks in the 1990s, international reinsurance capacity was largely withdrawn, triggering a government-supported solution: Pool Re started to provide limited cover to insurance companies, benefiting from the government's pledge to act as "reinsurer of last resort" in case of insolvency.

⁶ All programmes are still in place suggesting that the private sector continues to be reluctant to play a more prominent and independent role. This reluctance may also reflect the fact that, given the absence of any new large-scale attacks, prices for terrorism insurance have declined significantly and it may simply not make commercial sense for reinsurers to bear terrorism risk without government involvement and support.

For example, in the U.S., terrorism coverage is not mandatory but insurers have to offer it if policyholders ask for it. There is no pool arrangement, i.e. no risk mutuality among direct insurers. Under the Terrorism Risk Insurance Act (TRIA) the federal government agrees to pay up to 85 per cent of any insured losses arising from certified acts of terrorism, with an annual cap of US\$100 billion. This federal backstop is free of charge, which leads to a *de facto* crowding out of private reinsurance solutions

In Germany, private insurers and reinsurers have set up a specialised Property insurance company to mutualise major terrorism risks. Government backing is relatively limited. Main exclusions are war, civil war as well as nuclear, biological and chemical attacks. In addition, terrorism coverage is not compulsory in Germany.

In France, on the other hand, terrorism insurance coverage is compulsory, i.e. the state imposes solidarity. Insurers are reinsured by a pool which enjoys unlimited government backup. As in Germany, some private reinsurers provide capacity on a non-proportional basis (i.e. limited and easy to control) to the collective schemes of risk pooling and mutualisation.⁷

Implications for key reinsurance processes

In the aftermath of September 11, reinsurers did not confine themselves to promoting effective public-private partnerships. The terrorist attack prompted a thorough and comprehensive review of core business processes such as product development, pricing, underwriting, risk and capital management. Insurers and reinsurers who were willing to assume terrorism risk have implemented a number of changes directly arising from September 11, changes that have affected other lines of business, too.

Wordings, clauses, definitions and exclusions have been updated and clarified. In general, the World Trade Center losses were an important catalyst for much improved contract certainty, primarily in the area of coverage clauses. The lack of contract certainty at inception led to a particularly acrimonious legal dispute between a number of insurers and reinsurers on the one hand and the leaseholder of the Twin Towers on the other. This deficiency was effectively addressed in the years following September 11.

In addition, reinsurers have refined their pricing methods for all types of exposures, more accurately reflecting risk type, country, region as well as loss experience. Loss models for natural perils have been continuously refined and improved. Additional regions and perils have been added and the concept has been extended to other lines of business. The separation of costing (the estimation of the expected loss, allocation of external and internal expenses and capital cost) from pricing (the establishment of a selling price for an insurance or reinsurance product in the open market) has been accomplished throughout the insurance and reinsurance industry. Reinsurers have also developed and implemented significantly improved scenario estimates previously considered unthinkable for single risks and exposures. Early warning systems were bolstered and risk research efforts, e.g. in apparently remote areas such as space weather, intensified.

At the same time, reinsurers responded to a key lesson learned from September 11 by enhancing accumulation control methods and capabilities: Many were caught by surprise by the multitude of lines of business simultaneously affected by the attack. Risk modeling

⁷ See the contribution from Ortolani, Savorelli and Zanghieri in this publication for further details on various national schemes.

has been considerably improved not only to take interline accumulation into account, but to include both the asset and the liability side of the balance sheet.

The bottom line—What has changed

After the terrorist attack of 11 September 2001, financial markets recovered faster than anticipated. Except for a short-lived slump, economic growth, the single most important determinant of insurance and reinsurance demand, was not impaired in any meaningful way. Globalisation and cross-border trade and investments resumed their pre-September 11 pace a few months after the event. There was no protectionist backlash either.

From an insurance-specific perspective, insured losses turned out to be lower than originally feared and industry balance sheets regained their previous strength quickly. However, demand for private sector coverage against terrorism risk which understandably surged in the wake of the event, kept decreasing in tandem with a weakening sense of vulnerability.⁸ Accordingly, rates continuously declined, denting the commercial attractiveness of becoming involved in terrorism insurance and reinsurance.⁹

Although less influential than initially anticipated, the attack led to significant changes to the general landscape and the environment in which insurance business is conducted. It did teach insurers and reinsurers some valuable lessons. These were learned and embraced and should make the industry even more resilient to withstand the next “Black Swan”:

- The global system of risk transfer and diversification through insurance and reinsurance proved its mettle. One of the biggest insured losses in history, totally unexpected in nature and size, was successfully absorbed, primarily by European reinsurers.
- The global reinsurance industry’s capital base was restored quickly, not least by startup reinsurers, limiting incumbent players’ scope for recouping losses. This insight prompted established reinsurers to accelerate their moves towards a more flexible business model based on “cycle management”.
- Public-private partnerships were further developed, combining the imposition of solidarity through compulsory insurance requirements with a balanced scheme of loss sharing aimed at aligning the interests of all major stakeholders.
- In light of costly litigation and some unfavourable media coverage, the industry has woken up to the importance of contract certainty as a cornerstone of the professional conduct of business.
- Reinsurers have redoubled their efforts to think and prepare for the “unthinkable”. In addition to enhancing traditional capabilities such as accumulation control and risk-based costing many reinsurance companies and intermediaries are now placing more emphasis on qualitative scenario analysis and planning.

⁸ However, this decreasing perception of vulnerability may be deceptive as new forms of terrorism start to emerge, e.g. cyber terrorism or maritime terrorism aimed at disrupting vital sea lanes (see Insurance Information Institute, 2010).

⁹ See, for example, Guy Carpenter (2010) for a recent survey of treaty underwriters involved in terrorism reinsurance, confirming this downward trend and elaborating on the reasons for it.

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September 11—The permanent date: a personal view from the U.S.

*Gordon Stewart*¹

They still come every day. New York City has a truly 24-hour transit system, so they come every night too. It doesn't seem likely they will ever stop coming. Ten years later the impact of two jet airplanes and the collapse of two great buildings draw visitors who stand out from the commuters and the other tourists in several ways. They speak in many languages and accents. They have a kind of focus that makes them noticeable on the subway. They ask directions in hushed tones. Otherwise they are quiet almost to the point of total silence.

But their faces all reflect a common question: what must this indelible day have been like? It's a question that employees of the Insurance Information Institute (III) have a special ability to answer. The III offices on the 34th floor of 110 William Street were and are within direct sight of what were the Twin Towers, now known as Ground Zero. III staff began answering questions minutes after the first plane struck at 8:45 AM. They continued to handle streams of questions as they watched through the windows of the big conference room when the second plane sliced through the second tower—and the world knew it was not witnessing a terrible accident but an even more terrible opening to this millennium with a profound change that still defines our time more than any other single event.

Devastating hurricanes and tsunamis, typhoons and earthquakes, cyclones, fires, and floods continue to destroy people and places around the world. They always have and always will. States react, insurance works, people mourn and rebuild. Individual lives are lost and survivors are devastated. But governments, insurance, and life in general go on, not fundamentally altered by natural catastrophes. The opposite is true for institutions and individuals since the indelible date of September 11. Our world will simply never again know the innocence of that cloudless, bright blue morning, when the Twin Towers still shone in the sun like a modern Stonehenge.

For the III staff, the loss took terrible and totally contradictory forms. Even as they heard the terrible sounds of the airplanes smashing into the buildings, saw the towers in flames, the human beings falling, flailing, knowing relatives, friends, and colleagues were dying, staff members were surrounded by words and images from the global media trying to cover what they themselves were actually witnessing, and—most surreal of all—fielding floods of cold, sharp questions from around the world like, “So what's the damage? How

¹ Liaison Officer North America for The Geneva Association.

much will this cost you? Are you guys going to pay claims? The President just called this an act of war...will the industry invoke war exclusions?"

Then the first tower collapsed, descending down on itself like its own elevator taking the whole structure down along with it. Debris pelted the III windows. Dust clouded the view. When the second tower fell, the sky that had seemed like a distilled essence of blue became a cloud of darkness and death. Still the questions kept coming, hard, challenging questions with no ready answers. III's Chief Economist Robert Hartwig was trying to explain this was unprecedented. The media staff was relaying both their first-hand accounts and such existing insurance language as seemed to apply. I recall using a phrase to the effect that "*There is nothing in the Great Book of Insurance that tells us all what we do now.*"

The effort to understand and explain continued until the collapse of yet another Trade Center building destroyed a power substation, and all Lower Manhattan shut down. III staff members walked down the 34 flights of stairs into the darkened, chaotic streets, making their separate ways home, troubled by the fate of others, the state of the world, and unanswerable insurance questions.

The next days saw the industry struggle with, and resolve, the most basic question of all—would we accept the tragedy of September 11 as our event, as well as that of the victims, the nations, and the world? There are many accounts of how this question came to be answered by the industry with a clear, collective "yes". Each account comes from the unique and valid viewpoint of a different participant. I have vivid memories of calls to and from Washington, the New York State Capitol, insurance CEOs across continents and oceans, trade associations representing the various sectors of insurance. No one I spoke with had any higher priorities than what should we do for our policyholders, for our employees and their survivors, for the United States, and for the world community trying to understand that its operating assumptions and realities had changed for a century at least.

In a remarkably short time the consensus formed that the insurance industry would be at the centre of the event and the recovery. Insurance companies manned the assistance centres in New York and Washington. Property/Casualty companies set up special operations facilities as close to the site as possible. Life insurers created special procedures for claims. CEOs met with the President, Governors, legislators, and other officials, pledging full cooperation in the long recovery. The III opened a Disaster Insurance Information Office at its own location near Ground Zero. The most stunning physical change was that the Institute's windows, which had always provided a way to glance upwards and appreciate the awesome height of the World Trade Center Towers, now offered a full view of the Hudson River.

It soon became clear to the insurance industry that even handling the biggest and perhaps most complex loss event in its history was only the first step in dealing with a world transformed by a new, wide-ranging, and long-lasting risk—that of high impact terrorism. We had just witnessed how a deliberately plotted, man-made event could inflict more damage than almost any sudden natural catastrophe. But the only thing it had in common with events we had been insuring for centuries was that it was likely to happen again. Even the potential scale of future events was virtually incalculable once nuclear and biological threats were considered.

Thus began the long, difficult, and contentious effort to establish the principles and practices that now largely define the relative responsibilities of insurers, insureds, and governments in dealing with terrorism risk which, in the United States, finally resulted in the Terrorism Risk Insurance Act (TRIA) and its 2007 successor. Others have done justice to this significant and fascinating story. The most important aspect of the struggle from my point of view was formulating and advancing the basic argument that the U.S. Government had any responsibility at all to be financially involved in insuring against terrorism risk.

That this axiom should even be open to discussion often comes as a shock to citizens of European and Asian countries. It can seem astonishing that leaders of government would not accept the principle that since by definition terrorism is an instrument for influencing a nation's policies and actions, insuring against its risks is also a concern of national governments. But the fact is that for the U.S. it provoked an intense, even virulent, debate. Even though no public money was paid to insurers, and insurers and reinsurers paid over US\$23 billion in current dollars for September 11, with foreign carriers accounting for more than 50 per cent of all claims, the TRIA proposals were labeled and derided as "bailouts" of the insurance industry.

Non-Americans are often not aware of our powerful national ideological notion that all economic activities should be totally subject to the workings of the "free market" and utterly purged of any governmental financial participation—except of course when an opponent of government intervention in the private sector benefits from it. Somehow one's own business, whether it's sugar production or shale extraction, is so vital to America's security that all kinds of subsidies and protections are needed for the physical safety of its citizens and survival as a nation. All others are simply freeloaders at the national trough.

It did not help that while the collective popularity of insurers is statistically good according to the annual survey of public attitudes towards insurance in the U.S. taken by the III since 1968, from a rhetorical perspective they are not always easy to defend. A seemingly self-evident argument had to be painstakingly built and relentlessly pressed that terrorist attacks were not accidents or natural acts, but deliberate attacks on the United States. The President of the U.S. described them as making war and our responses as part of a war on terrorism. The country was told repeatedly that such attacks could not be totally prevented and that some could cause vast devastation. We pointed out that, unlike hurricanes and earthquakes, house fires and auto accidents, U.S. Government policies themselves played a role in terrorism risk.

Also persuasive was the undeniable fact that, unlike auto crashes and workplace accidents, the U.S. Government was the dominant source of intelligence, prevention, and mitigation. Indeed, much of what it knows about terrorism risks is classified and cannot be shared with insurers who are being asked to price the risk. The purely practical argument that the potential losses from terrorist attacks far exceeded the capital available to pay for them had some effect, but had to overcome the very significant obstacle that the media tended to cite the total capital of the entire industry as though all of it were one gigantic pool available for any and all claims that might arise. I don't know how many times III and others had to explain that people's auto premiums had to go to pay auto claims, and their life premiums couldn't be diverted from their death benefits to an attack on the Empire State Building.

In the end, a combination of these arguments succeeded, though with great difficulty. In my view, the one fact of American life that even the most unyielding free market fanatics (themselves excluded) couldn't make go away was that national security is the Constitutional responsibility and monopoly of the U.S. Government. Therefore when the government formally declares it cannot guarantee its own citizens physical protection from terrorism it is unreasonable to order insurers to provide them with financial protection from terrorism.

So in 2011, as we mark the 10th anniversary of an event no one alive can forget, it would seem that all is fairly quiet on the terrorism insurance front. We can commemorate those we lost. We can try to comfort their survivors. We can acknowledge our writing of a brave new chapter in *The Great Book of Insurance* and going far beyond its literal meaning to help New York and America recover. We can seek to maintain and refine the public/private sector sharing of responsibility for terrorism risk.

However, I believe that the most important implication of terrorism risk today is that it is very far from over. On the legal and regulatory front, the President's Working Group on Market Conditions is mandated to provide periodic reports on the state of terrorism risk insurance to Congress, and the Obama administration proposed cutting back on Washington's terrorism coverage participation in its 2011 budget. The industry will need to remain vigilant and active in the terms and conditions of its relation to the various authorities, including the new ones just being established at the U.S. federal level.

Still, ten years after September 11, I believe the most important questions are not what's happening to TRIA or the Terrorism Risk Insurance Program Reauthorization Act (TRIPRA), or even what it was like to have actually been there when the towers fell. They are about what will happen now and next, given the fundamentally altered national and geopolitical context of this country in this century, when the inevitable new attack occurs.

September 11 affected far more than the insurance industry and its relationship to the U.S. Government. It has transformed American society more deeply and broadly than any event since World War II. Even World War II did not result in the creation of an omniscient and omnipotent U.S. "Interior Ministry" as a vast security agency instead of a Department of the Interior concerned primarily with land and the use of other resources. The new Department of Homeland Security employs some 200,000 people and has a budget over US\$40 billion. Its policies, practices, and presence are ubiquitous. Ironically, the ability of insurance organisations to hold international gatherings in the U.S. of the very firms that are required to offer terrorism risk cover if they do business there, is diminished by the intense scrutiny of "foreign" citizens.

Observers in the U.S. and abroad comment often on the degree to which the U.S. is becoming a kind of "National Security State", in which concerns about terrorism trump all others in everything from small town police work to national political discourse. The balance between individual liberties and state power has been altered more fundamentally than in any other time of peace in U.S. history—and on a bi-partisan basis. There is virtually no meaningful opposition to seeing the U.S. as a nation under permanent threat of imminent attack that overrides all other consideration, even from the courts. Behaviours in cities like New York and towns like Oskaloosa are affected. Citizens are constantly reminded to "Say Something", "Remain Alert", "Protect Yourself". A pervasive sense of fear is fostered that serves many interests, especially those of unchallengeable authority.

The saddest consequence of the terrorist attacks of September 11 and others is that they have been to a degree successful. Not so much in creating frightened multitudes, although the panic that breaks out after every incident is frightening in itself. But terrorism, especially the fear of terrorism which is its objective as a strategy, has succeeded in terrorising our leaders of the political consequences of terrorist events on their “watch”.

In 2001 almost all political factions rallied around President Bush and Mayor Giuliani. The next executives whose jurisdictions are attacked will be attacked themselves. They will be blamed by their opponents for not protecting their citizens, for “letting it happen”, most likely for not spending enough money, hiring enough security forces, or not clamping down more aggressively on protests, dissent, or members of whatever ethnic, religious, and/or racial group who carried out the attacks. So all across the political spectrum, executives seek and are granted greater and greater authority and control.

Why does this matter to the global insurance industry, apart from what effects it may have on the U.S. fiscal situation and inconveniences of travel? Fundamentally this: when September 11 happened out of the clear blue sky, insurers worked earnestly and furiously to re-write The Great Book of Insurance to best serve people and governments. Next time, the accepted authority of the executive in situations involving “national security” might be so great and unquestioned that The Great Book of Insurance could say what the President of the United States wants it to. If he or she doesn’t like what’s been evolved so far, there is a danger that minions will re-write the inconvenient sections. Governors and Mayors will deflect criticism from events that took place on their watches by promising to be tough on insurers. Already determined not to be blamed for terrorist actions because they are supposed to uphold the individual protections from the state in the U.S. Constitution, courts cannot be relied upon to construct policy language literally in the aftermath of an attack on the country, anymore than they did under normal domestic political pressures on coverages in past years.

So every time insurers hear the words, “That was before September 11”, or “It’s a different world now”, it’s important to realise they can be applied easily to insurance assumptions as well. And since the industry is based (or is supposed to be based) on actuarial science, given the tense state of the world and the fears its leaders confront for their own political futures, it’s prudent to bet that insurers could hear those words applied to them someday. Unfortunately, assessing the risks of when and where that may happen, and how much more than anticipated it may cost, is difficult. Fortunately, the strong legacy of putting people and governments first in 2001 should count for something in 20__?.

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10 years after September 11: the changing risk landscape in Asia and its social and economic challenges in the age of increasing uncertainty

Katsuo Matsushita¹

1. The 11 September 2001 terrorist attacks triggered a wave of terrorist acts in South East Asia

In October 2002, three bombs were detonated in the world famous Indonesian resort of Bali, causing the death of 200 people, mostly foreign tourists. Then in November 2005, another terrorist bomber attacked Bali, killing 20 people. In Jakarta, in August 2003, a suicide bomber attacked the Marriot Hotel, and in September 2004, another suicide bombing attack occurred near the Australian embassy. This series of terrorist attacks was reported to be the work of Jemaah Islamiyah, under the influence of Al-Qaeda.

In the Philippines, the Abu Sayyaf Group, an extreme militant Islamic terrorist group, has carried out a series of kidnappings for ransom. According to a Lloyd's report, at least 147 Philippine nationals have been kidnapped by the group since 2000.²

In recent years, these terrorist attacks have abated. This might be due to the fact that economic development in these countries lifted many people out of poverty and therefore poor people feel less tempted to support terrorist groups. The favourable economic situation enabled governments to initiate compromises with opposing minority or militant terrorist groups by offering incentives towards peaceful negotiations.

Asia has also been concerned with piracy problems. Indeed, the Strait of Malacca, one of the most important sea lanes in the world, connecting the Indian and Pacific Oceans, has been the scene of numerous piracy attacks. Keeping the security of the Strait is critical for the sustainable development of trade and investment for the Asia-Pacific region as a whole. According to the annual report of International Chamber of Commerce (ICC) International Maritime Bureau (Piracy and Armed Robbery against Ships 1 January-31 December 2010), the number of piracy attacks in this Strait has dropped due to the increased and aggressive patrols by littoral states authorities since July 2005, going from 38 cases in 2004 to only two in 2008 and afterwards. The piracy situation has been improving in other part of the South East Asian region. According to the report at the 2010 Annual Conference of the International Union of Marine Insurance (IUMI) held in

¹ Advisor and Liaison Officer for Japan and East Asia, The Geneva Association.

² See http://www.lloyds.com/Lloyds/Press-Centre/Press-Releases/2008/02/lloyds_spells_out_need_to_understand_unique_and_complex_terrorism_threat

Zurich, incidents have significantly declined due to the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia.³

2. From 2001 to date, Asia has experienced many types of disasters, ranging from tsunamis to pandemics

In the winter of 2003, there was the outbreak of Severe Acute Respiratory Syndrome (SARS) in large parts of Asia. The rapid pace of urbanisation and globalisation which allows the frequent movement of people by air and seas has aggravated the spread of the disease. Globally, 8,000 people were infected and 775 people died.

In December 2004, we experienced the magnitude 9 Indian Ocean tsunami, with victims totaling over 220,000 people. An earthquake of magnitude 8 occurred in Sichuan, China, in May 2008 took the lives of 87,000 people. Every year, we record floods, landslides, typhoons and cyclones across East and South Asian regions. The rapid pace of urbanisation in East and Southeast Asia has been aggravating the severity of economic and human losses. On 11 March 2011, a magnitude 9 quake and tsunami hit Northeastern Japan, causing fatalities of 25,000. It was a multi-faceted disaster, stemming from a tsunami, quake, leakage of radiation from the Fukushima nuclear power plant, disruption of supply chains, many cracks in river levees, subsidence and salinity of farm land, etc. The impact on supply chains reminded everybody of the fact that business enterprises in many countries are much more interconnected than generally thought. The Great East Japan Earthquake and the wider range of damage it caused were a terrible shock to other Asian countries that had been viewing Japan as a model for disaster mitigation and adaptation. It is expected that the introduction of natural disaster insurance schemes, based on public-private partnerships, will be considered. Indeed, this would increase Asian societies' resilience to earthquakes and other types of disasters. These insurance schemes would be similar to the earthquake insurance scheme covering residential houses in Japan.

Japan's 11 March disaster has provoked a fresh mindset toward risk management for both people within the insurance industry and among insured enterprises, not only in Japan but also in other countries. For example, boards of directors may face increasing accountability and stakeholder scrutiny as far as the definition of maximum corporate risk exposure is concerned. This comes from lessons learned from the Fukushima nuclear power plant failure where TEPCO, the plant operator, assumed that the maximum height of a possible tsunami wave would be 6-7 metres, where in fact the actual height was more than 13 metres. Who defined "the maximum thinkable level of tsunami"? Also "when, why and how defined" must absolutely be substantiated in the risk and crisis management procedures. This is especially so in the operation of complex plants such as nuclear power stations. Throughout these processes, CEOs and board members will be encouraged to review the "boundaries of thinkable risk and crisis" much more robustly.

While some manufacturers in Northeast Japan resumed their normal levels of operation much faster than expected, Japanese assembly manufacturers have started to refine or partially revise their "just-in-time inventory" system applied globally. Given the lessons from the huge quake, they have started to review their supply chain management by striking a more adequate balance between efficiency and safety. Perhaps, more diversification

³ <http://www.iumi.com/> IUMI Zurich Conference September 12-15 2010. Report by Michael Davies, Chairman of Cargo Committee of the IUMI.

of suppliers and a tighter grip on their suppliers' network, including suppliers of main suppliers, may be implemented.

Notwithstanding an increasing frequency and severity of natural disasters, economic growth in Asia since the 1990s to date has contributed to reducing the percentage of people living in poverty among the total national populations. As an example, in China the percentage of people living on less than US\$2 per day reduced from 75.5 per cent in 1995 to 35.7 per cent in 2005; in Thailand, from 17.5 per cent in 1996 to 11.5 per cent in 2004; in the Philippines, from 52.6 per cent in 1994 to 45.0 per cent in 2006; and in Indonesia from 77.2 per cent in 1996 to 54.6 per cent in 2005.⁴

However, in most of these countries, the income gap between urban and rural areas, and between the rich and poor among urban residents has been widening. Aggravated by rising food and fuel prices, this situation is causing serious social and (in some cases) political tension.

China and Thailand may serve as examples. In China, several cases of strong public grievance, culminating in demonstrations and even street riots have been reported. Several factors are behind these incidents. Immigrant workers from rural areas have only limited access to education and health care, and are being treated differently from urban residents under the "hukou" system which specifies the location each citizen belongs to. Even graduates from colleges and universities are complaining that chances to apply for decent jobs are not equally available to every student. Unless he or she has family or other types of relationships with influential officials or executives, the chances of winning a promising and stable job are extremely limited. This way, the rich continue to be rich and the poor remain poor, generation after generation. This stifling situation with limited social mobility may hinder the building of social cohesion and solidarity.

Serious ethnic violence is regularly reported in the western Chinese province of Xinjiang, populated by mostly Turkic-speaking Uighurs. The province is the home of rich natural resources which spurred many Han Chinese to move and live there. Some Muslim Uighur people are unhappy with the growing presence of Han people. Under these circumstances, violence erupted in 2009, killing 200 people. On 18 July 2011, at least 20 people died. On 30 and 31 July, 14 more people were killed.

Thailand is another example of political unrest. Unlike its neighbouring countries, Thailand never was colonised by Western powers and was famous for its stable society and democracy under the monarchy until just a decade ago. What has changed in the political and social situation of this "kingdom of smiles"? In the general election of 2001, the party led by Mr Thaksin Shinawatra successfully gained the majority of seats of the Congress by building royal constituencies in the north and northeastern rural regions, promising health care services to the rural residents for the first time in Thai history, a moratorium for farmers who have been suffering from debt since the 1997 Asian currency crisis and setting up a fund to revitalise the economic infrastructure of each village. During his tenure as Prime Minister, the average income in rural areas increased faster than that of the metropolitan area. This has resulted in a political empowerment of the rural voters. In the general elections in 2005, Mr Thaksin obtained the majority of seats again. But opposition groups, mainly high ranking governmental officers, military personnel and higher income people in metropolitan areas began to voice their concern

⁴ <https://sdbs.adb.org/sdbs/index.jsp> This is the statistical database of the Asian Development Bank (ADB). Refer to "Poverty headcount ratio at US\$2 a day (% of population)".

about his political style and his constituencies, empowered farmers and poor people in cities.

On 19 September 2006, Mr Thaksin was ousted from the post of Prime Minister by a military coup and exiled. With his absence, political tension between pro-Thaksin (red shirts) and anti-Thaksin (yellow shirts) intensified. Finally from April to May 2010, violent confrontations between pro-Thaksin demonstrators and the police force resulted in 90 deaths and 1,500 injured. A cloud of uncertainty is still hanging over the kingdom. In the latest general election on 3 July the Puea Thai party led by Ms Yingluck Shinawatra, the younger sister of Mr Thaksin, won the majority of seats. It remains to be seen whether she will achieve her declared objective of bringing about a broad political reconciliation.

In addition, the southern provinces of the country are regularly affected by social unrest and sporadic acts of terrorism. It was reported that a militant Muslim minority seeking independence attacked Hat Yai International Airport in April 2005, causing damage to the local tourism industry. Thereafter, while the scale is not large, terrorist attacks were reported in 2009 and 2010.

To our surprise, despite these political upheavals, the economic prospects of Thailand have largely remained intact and the country remains the “Detroit of Southeast Asia”, the hub of automobile manufacturers. That being said, demand for insurance coverage against riot, strike, malicious damage and sabotage has been rising as have rates, testifying to the increasing awareness of political risk among insureds.

3. What are the main uncertainties down the road in Asia?

Political leaders in Asia must handle a challenging agenda, ranging from sustainable economic growth, inflation (especially the price of food, fuel and electricity), income gaps, fair and equal access to health care/education, combating corruption, enhancing resilience against large scale disasters, reducing greenhouse gas emissions, to the strengthening of the nationwide social cohesion.

I believe one of the major common policy concerns in Asia is how to avoid “the trap of the middle income country”. For this objective to be met, continued economic growth supported by enhanced competitiveness, efficiency of production and technology are essential. Also, a robust political system that brings the benefits of economic growth to rural regions is critical.

In addition, the demographic bonus of Asian countries, with some exceptions, is fading earlier than generally thought, as from 2015 in China for example. In this year, population growth ratio of the Chinese aged 15-64 is expected to turn lower than that of the total population. This change indicates that the Chinese economy will not be able to depend any longer on the export of goods supported by the ample supply of labour force. This is one of the major reasons why the Chinese Government has been putting policy priority on industrial research and development. Also, by encouraging the migration of younger people from rural areas to cities, governments can mitigate the adverse effects of less favourable demographic development. Such a policy is compatible with the age of mega-competition among the mega-cities in Asia.

So, here is the big question: how to redistribute some of the wealth from urban to rural areas where the proportion of aged people will increase and the financing of these people’s pension and health care depends on transfers from mega-cities? The major challenge will

be to reconcile two conflicting needs: the need to further enhance the competitiveness of mega-cities and the need to promote social welfare, especially in rural areas. Ultimately, this challenge is about balancing national competitiveness and nationwide social cohesion. How this challenge is addressed will be a key determinant of Asia's overall risk landscape going forward. It seems that Asian political leaders have a long list of issues that will keep them awake at night.

Asia is quite a diversified region; it includes large emerging economies like China, India and Indonesia, developed economies like Japan, Korea and Singapore, as well as less developed countries. The region has considerably developed in economic terms in the past 10 years and this is due, inter alia, to the post September 11 global momentum, where free trade of goods and services has been promoted. Among others, this is exemplified by the launch of the WTO Doha Development Agenda (DDA). As yet, the DDA is at an impasse; however, in Asia, the regional Free Trade Agreements (FTAs) have been facilitating intra-regional trade and investment, both being main drivers of further economic development. FTAs with countries beyond Asia have also facilitated international trade, to the benefit of Asian development.

As Asia develops, it is seeing the similar new, tough societal and economic challenges as other developed economies brought about in part by global development and September 11 events. These societies now require a level of policy design and consideration that did not exist before. This is also true for the business communities in Asia, including multinational corporations active in the region, who have to implement the enhanced level of risk appreciation and management. Insurance companies, be they local or multinational, will equally have to face this challenging task.

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The impact of September 11 on insurance regulation: an appreciation

Patrick M. Liedtke¹

Introduction

Some historic events do not seem to appear as such when they happen and others turn out to be of less relevance in the longer term than people believed at the time they happened. The first is often true of events that turn out to be soft triggers or accelerators of developments that are “ripe”, while the latter are usually associated with catastrophes and other extreme events that generate also a lot of emotional impact. In many ways, the September 11 terrorist attacks in the U.S. embody both: an under-appreciation of some elements that were triggered by them and an over-estimation of others. This contribution will try to bring some focus to those issues that, ten years after the attacks, have resulted in meaningful change in the way that insurance regulation is conceived and conducted.

The following four areas shall be discussed from a qualitative point of view, with the intention to isolate relevant elements that would not only help us appreciate and understand the lasting impact of the September 11 occurrences but also indicate some issues that will doubtlessly further develop. This will be especially true for those aspects and developments where the attacks had catalytical character:

- Institutional implications,
- Business line impact,
- Market effects, and
- Public perception.

Before entering into the analysis it is important to remember how complex and multi-dimensional the insurance of risks in a modern economy is. The intricacies and specificities that go with it are described in greater detail in a contribution to *The Geneva Papers on Risk and Insurance—Issues and Practice*.² All nation states regard insurance activities as most relevant to their economies and hence regulate and supervise them comprehensively. Insurance is a highly sophisticated financial services business that interacts with many aspects of the lives of citizens and is central for the development of the wider economic system. The importance of the industry can only in part be measured by the number of its employees, insurance premiums, the assets under management, or its contribution to the national GDP. Being a necessary precondition for many activities that would not take place were it not for insurance, governments want to ensure efficient markets and proper conduct. It should therefore not surprise much that all countries around the world regulate

¹ Patrick M. Liedtke is Managing Director and Secretary General of The Geneva Association.

² Liedtke (2007).

insurance companies rather heavily and have placed the activities in their insurance markets under close supervisory control.

Institutional implications

Despite turning out to be the most expensive man-made disaster yet on record,³ the September 11 attacks had surprisingly little impact on the institutional setup of the U.S. and other insurance markets. The U.S. has been governed by a setup that builds on virtually all insurance activities to be state-regulated. The original setup can be traced back to the 1868 Paul vs. Virginia ruling when the Supreme Court ruled that insurance policy contracts were not in themselves commercial contracts and that as a consequence, insurance was not subject to federal regulation. The modern era of insurance regulation began in the 1940s when several other rulings upheld the state-based principle, even as the understanding evolved to regard insurance policies as commercial and thus subject to the regulation of other similar contracts.

Individual administrative agencies controlled by the states, usually called the Department of Insurance, are responsible for insurers and insurance markets. While the prudential oversight of insurance companies and their capital adequacy as well as the granting of licenses are central to the supervisor's work, that includes also other areas such as policyholder protection, adequacy of premiums, and minimum standards. Faced with the new national terrorism threat of September 11 and in face of fears that this could have been the first in a series of attacks a new push for federal regulation ensued. However, it quickly petered out as it became clear that the challenges that the terrorist attacks had created could be coped with adequately within the then existing framework. The situation might have evolved differently, had the September 11 attacks been followed by more sustained terrorist activity on a similarly disruptive level.

Nevertheless, another little step towards a possible federal regulation of insurance activities was taken as the discussions around TRIA and other federal solutions⁴ gained some more momentum. This has proven to be important in the following years, as the industry and especially the larger insurance companies with sizeable multi-state operations have expressed more interest in federal solutions. It has also had an impact on the global discussions about insurance regulation and supervision as the National Association of Insurance Commissioners (NAIC)⁵ plays an important role at the International Association of Insurance Supervisors (IAIS)⁶ where international insurance matters are discussed and best practices for insurance regulation and supervision are set.

³ Typical original estimates for all insurance claims ranged from US\$40-50 billion while today the cost tally is regularly given as US\$23 billion (all in 2010 dollars).

⁴ TRIA stands for Terrorism Risk Insurance Act, the U.S. federal law of 26 November 2002. It created a federal backstop for insurance claims related to acts of terrorism and was originally intended as a temporary measure only, providing a stable framework and allowing enough time for the insurance industry to develop its own solution for terrorism risks. In 2007 it was extended under the Terrorism Risk Insurance Program Reauthorization Act through 31 December 2014. See also the contribution by Savorelli *et al.* to this report.

⁵ NAIC is the U.S. standard-setting and regulatory support organisation created and governed by the Chief Insurance Regulators from the 50 states, the District of Columbia and five U.S. territories.

⁶ IAIS represents insurance regulators and supervisors of some 190 jurisdictions in nearly 140 countries. Its objectives are to promote effective and globally consistent supervision of the insurance industry in order to develop and maintain fair, safe and stable insurance markets for the benefit and protection of policyholders; and to contribute to global financial stability.

However, things over the following years evolved slowly. It needed the latest financial crisis to trigger the next logical step: the creation of a federal entity that would project insurance expertise on the national level in the U.S. The experience of September 11, the ensuing discussions and then of course, as the major catalyst, the lessons from the recent financial crisis have led to the creation of the Federal Insurance Office (FIO)⁷ and a visible move ahead of insurance regulation and supervision in the U.S. The role of the FIO as advisor to the U.S. government on major domestic and prudential international insurance policy issues puts it in a spot that many observers in 2001 and 2002 believed would have made dealing with the (insurance) consequences of September 11 easier, especially if—as originally feared—more attacks would have followed in quick succession.

Internationally, these developments have also triggered more global contacts, greater awareness for necessary cooperation, and further regulatory and supervisory collaboration. They spawned new initiatives such as the IAIS ComFrame project, which is meant to take insurance another step towards more global(ly aligned) solutions.⁸ And they also had an indirect effect on solvency regulation around the world in that the occurrence of extreme events began playing a more prominent role in defining the solvency capital of insurance companies.⁹

Business line impact

The September 11 attacks affected a wide range of business lines: life insurance, property insurance, business interruption, liability insurance, and workers compensation to name but the most prominent. Not all lines of business were of course affected in the same way and had to struggle with their specific issues. For life insurance policies, for example, the fact that for many of the victims no identifiable body parts could be found called for a special solution. Insurance companies agreed to pay out claims quickly even in the absence of proof of death rather than obliging the victims' families to wait for the statutory waiting period to expire before being able to finally receive the payouts.

⁷ The Federal Insurance Office is a new office within the U.S. Department of Treasury established by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 21 July 2010. The Federal Insurance Office advises the U.S. Government on major domestic and prudential international insurance policy issues and consults with the states and state insurance regulators regarding insurance matters of national and international importance. The FIO monitors all aspects of the insurance industry and projects insurance expertise on the federal level. It also has the authority to identify issues or gaps in the regulation of insurance that could contribute to a systemic crisis in the insurance industry or the broader U.S. financial system and is also expected to play a role in the resolution of certain troubled insurance companies.

⁸ The IAIS began the development of the *Common Framework for the Supervision of Internationally Active Insurance Groups* (or ComFrame) on 1 July 2010. The initiative is meant to develop methods of operating group-wide supervision of Internationally Active Insurance Groups (IAIGs) in order to make group-wide supervision more effective and more reflective of actual business practices; establish a comprehensive framework for supervisors to address group-wide activities and risks and also set grounds for better supervisory cooperation in order to allow for a more integrated and international approach; and foster global convergence of regulatory and supervisory measures and approaches.

⁹ See e.g. the use of risk scenarios that insurers have to establish under the new Solvency II regulation in Europe or the Swiss Solvency Test that have very tangible implications for the calculation of the solvency margins and any minimum capital requirements.

Shortly after September 11 a special compensation fund for victims of the attacks, called the Victim Compensation Fund, was created by an Act of Congress.¹⁰ It aimed at avoiding a clogging of the U.S. judicial system by accelerating the compensation of the victims of the attack (or their families) in exchange for their agreement not to sue the airline corporations involved. Special regulations had to be developed by the Fund to make sure any solution would be acceptable to the victims and avoid a large number of law suits arising from the event. Experts working for the Fund had to estimate how much each victim would have earned in a full lifetime so as to determine how much each family would receive. Once the offer from the Fund was accepted, it was not possible to appeal. Beneficiaries, however, could demand a special hearing if they deemed the offer inappropriate. In the end, the Fund issued awards for 2,682 personal injury claims.

“The awards are quite varied, reflecting the varied nature of the injury, the recovery, the existence or lack of existence of a disability or incapacity, the long-term prognosis, and the ongoing pain and suffering or lack thereof for each victim. To date,¹¹ awards have ranged from a low of \$500 to a high of over \$8.6 million after offsets.”¹²

While no such far-reaching efforts have been necessary since to compensate many victims of a similar event, there were regulatory lessons drawn from the experience that are still with us today. Victim compensation and the appropriateness and efficiency of the processes became a focal point of attention. As a consequence, many insurance companies reviewed their claims recording and payout practices, and insurance regulators checked existing legal norms for their suitability. Any large-scale disaster today profits from the added insights following the September 11 attacks.

While the property claims should have been rather straightforward, the problems surrounding the insurance of the World Trade Center (WTC) turned into protracted legal battles between the lessee and various insurance and reinsurance companies over the appropriate claim amounts.¹³ One of the immediate consequences of this conflict was a reappraisal as to how insurance companies and their clients underwrote certain risks. Brokers and their interests played also a special role. Often, insurance companies would start covering certain risks without having the full documentation ready. Cover would be granted on the back of so-called insurance binders. An insurance binder is the temporary issuance of insurance cover until a formal policy is issued. Insurance binders carry the most relevant pieces of information such as the name of the insured, the beginning date and any limits of coverage, the type of insurance, the risks being covered and the company issuing the insurance policy, etc.

Following the September 11 attacks and the partially successful attempts by the WTC lessee to exploit the fact that a formal policy was not yet issued, insurers changed their underwriting standards. While insurance binders still exist today (and are necessary to cover risks in certain circumstances) the wide-ranging practice of what some observers called the “get the deal done and worry about the fine print later” approach was largely

¹⁰ Cf. the Air Transportation Safety and System Stabilization Act (49 USC 40101) and the subsequent September 11th Victim Compensation Fund of 2001 Final Rule of 13 March 2002.

¹¹ On 28 January 2005, the last update of the Fund’s information base occurred. It is estimated that payouts covered some 97 per cent of the families concerned and awarded US\$7 billion in the process.

¹² September 11th Victim Compensation Fund of 2001, available at http://www.justice.gov/archive/victimcompensation/payments_injury.html

¹³ For a more detailed analysis of this conflict see Richard Murray’s contribution in this report.

abolished. Especially large industrial risks are today underwritten in full and coverage regularly starts with the issuance of a full and comprehensive insurance policy.

Market effects

At first it was feared that insurance companies would have problems paying out the potentially massive claims that followed the September 11 attacks. In the first weeks after the event, claims estimates ranged widely and some observers saw a potential that they could reach US\$100 billion. The Geneva Association research following the event¹⁴ showed that the claims capacity of the insurance industry would be enough to cover the event and its associated claims. However, the wild swings in claims estimates and especially the uncertainty surrounding the probabilities of further terrorist attacks lead to a withdrawal of capacity in certain business lines. The efforts to get the aviation industry back to operate normally while it remained unclear how this industry could cope with the risks its operations generated in the absence of readily available insurance at anything that would be regarded as affordable by the airlines were central to the creation of the already-mentioned TRIA scheme.

Overall, the claims associated with the event led to a reduction in reserves, albeit capital flowed out of insurance balance sheets only gradually. What was more of a concern from a market point of view at the time was the deterioration of the stock markets that had begun well before the September 11 attacks but were accelerated by them. As insurers were large investors in stock markets, the fall in the Dow Jones and other stock indices internationally between 2000 and 2002 caused large losses, in particular as most insurers and reinsurers were running equity ratios significantly higher than today's. It is impossible to quantify¹⁵ by how much the Dow Jones and the other global indices fell due to the September 11 events, but it is certain that some of the fall has to be attributed to the attacks and the costs they created. These costs not only comprise the loss of life, infrastructure and other values but also the imposition of additional expenses for future security and the burden created for people in the new security-sensitive environment.

At the same time, there was an important influx of money for recovery and to rebuild. The 2004 RAND study¹⁶ concluded:

“Insurance companies expect to make at least \$19.6 billion in payments, comprising 51 percent of the money paid in compensation.

Government payments total nearly \$15.8 billion (42 percent of the total). This includes payments from local, state and federal governments, plus payments from the September 11 Victim Compensation Fund of 2001 that was established by the federal government to compensate those killed or physically injured in the attacks. The total does not include payments to clean up the World Trade Center site or rebuild public infrastructure in New York City.

Payments by charitable groups comprise just 7 percent of the total, despite the fact that charities distributed an unprecedented \$2.7 billion to victims of the attacks.”

¹⁴ Some of it presented later as part of the contribution by Liedtke and Courbage (2002).

¹⁵ For a more thorough analysis of stock market effects see the Wharton School Paper by Doherty *et. al.* (2002).

¹⁶ Dixon and Stern (2004).

Over half of the payments came from insurance sources and through an efficiently working international reinsurance system, they were not only financed by U.S. companies but risk carriers in many parts of the world.¹⁷ The effectiveness of global risk diversification and the positive impact of the direct channelling of funds for the reconstruction efforts are lasting lessons from the September 11 experience. Following the event, many governments looked with new eyes at their national risk exposures and how to deal with extreme events.¹⁸

Insurance almost always plays a central role in how societies can and want to cope with large risks. Many discussions have followed the September 11 disaster but all experts agree that the availability of insurance funds had beneficial effects for the economic development and the performance of the markets.

Public perception

Insurers regularly gripe that their public image is not as good as it should be. In that, they are no different to most other businesses: everybody desires to be seen as better and any sector wants to be more liked. However, for the public image of insurers, September 11 was a major test case. Not only were the sums involved unusually large but given the special nature of the event and its media impact around the world, the industry was conscious that all eyes were also on its behaviour. While insurers tried to assure the U.S. government, their customers and financial markets that they had sufficient reserves to pay for the losses arising from the attacks, it was not immediately clear whether there was a legal obligation to do so. Under most insurance contracts, especially those covering commercial and private property, any “act of war” triggered an exclusion of the risk and would free the insurer of the obligation to cover the claim. When President Bush shortly after the attacks referred to them as “acts of war” he (most probably unknowingly) handed a free pass to insurance companies to opt out.

To possibly avoid billions of dollars in claims must have been very tempting for many insurers at the time. However, there is a difference between political discourse and an official state of war. As war-like as the rhetoric of the Bush administration and the highest officials at the time was, as unlikely it was that the government would have regarded any attempt by the insurance industry to opt out as a viable route for the business to take. The U.S. administration would not have let the issue go unchallenged. Legal precedent, while difficult to establish, would likely have made an opt-out contentious and the fact that on the day of 11 September 2001 no actual state of war of the U.S. with any country in the world existed would likely have been used to weaken any argument.

The insurers realised that even though there might have been a case, it was not a very strong one and would in addition to the legal challenges coming with it, have undermined everything the industry stands for. While it is true that no premium dollar was specifically paid for the risk of hijackers capturing planes and flying them into the WTC, and while

¹⁷ E.g.: on 18 May 2004, Swiss Re America Chairman Jacques Dubois reported in front of the U.S. Senate Committee on Banking, Housing and Urban Affairs that “*Our 9/11 claims totalled \$3.3 billion and we were the largest insurer of the World Trade Center.*” Quoted as per http://banking.senate.gov/public/_files/dubois.pdf Munich Re writes on its website that “*With a claims burden of US\$ 2.2bn, September 11 became by far the largest loss in Munich Re’s history.*”

¹⁸ The creation of special terrorism risk carriers in various countries as explained in greater detail in other parts of this report as well as the international discussions around the creation of National Chief Risk Officers (as per the Hyogo agreement) are examples of a new risk management sensitivity taking hold.

it is safe to assume that the lessee, presented with this hitherto unthinkable scenario and an additional premium demand would have surely declined it, insurance contracts regularly cover the unthinkable. The fact that insurers did not attempt to opt out and agreed to cooperate readily with the government to pay out valid claims quickly and with a minimum of administrative burden (especially compared to standard procedures, see above) contributed to the respect that insurers have commanded with their clients since September 11.

It is maybe a left-over from that time that consumers, when asked about the insurance industry in general give a more negative reply than if they are asked about their insurer specifically, which elicits rather positive reactions.¹⁹

Beyond the pure issue of public image, September 11 changed the perception of insurance solutions and their value to modern economies profoundly. The realisation that insurance is a necessary precondition for many economic (and indeed social) activities has entered the decision processes of politicians and the consciousness of the media. When the four American planes were crashed by the terrorists ten years ago, the biggest threat to the airline industry was not the liability cost; it was the prospect of a protracted grounding of the airfleet and having to insure the risks of flying potentially dangerous aircraft over urban areas themselves. As a consequence of the many discussions following September 11, the role of insurance is better understood. And even if we believe that the current state of enlightenment falls still short of an optimal state of comprehension, the gap has been closed somewhat.

So, in conclusion, with ten years between ourselves and the terrible terrorist attacks of 11 September 2001, the following insights can be gained:

- The event had surprisingly little immediate effect on insurance regulation and supervision, in the U.S. or elsewhere. However, it contributed to the acceleration of national and international regulatory developments already underway.
- Conversely, it caused a great improvement in the quality of some business practices, notably in how to underwrite large commercial and private property risks.
- The event demonstrated that the presence of a strong insurance industry with an appropriate regulatory and supervisory framework is vital to the public welfare, especially when societies are confronted with extreme events. It also showed how flexible the insurance industry can be when faced with the unthinkable and some outsized event.
- And finally, while insurers were generally appreciated for their response to the claims, the credit due to the industry has been somewhat overlooked.

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¹⁹ For more information on this phenomenon see the work and the regular surveys of the Insurance Information Institute in the U.S. (<http://www.iii.org>).

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The lasting impact of the World Trade Center insurance litigation

Richard H. Murray¹

I watched each horrific stage of the 11 September events from my nearby office windows, knowing that our world would be forever changed. And so it has. But I was focused on global security and did not then anticipate the significant changes that would affect insurance practices worldwide for this decade and beyond.

Many of the consequences of the event were immediately apparent: terrorism in the West, geopolitical change, economic distortions. In that first weekend of shock, long term effects on liability insurance on the way the insurance business is conducted were not on anyone's mind.

Yet the insurance impact emerged immediately. The acrid smoke had not cleared from the site before the lessee of the Twin Towers announced that it would be rebuilt with the US\$7 billion of property insurance he would recover from a global consortium of underwriters. That declaration was a shock to all members of the consortium, who had just days earlier completed a nearly year long negotiation resulting in a US\$3.5 billion programme. The quantum of coverage was chosen by the lessee as the insured value he sought for the entirety of the Twin Towers and the several other buildings on the same plot and under the same lease. What could possibly justify the promised recovery of twice the insured value?

Years of high profile litigation ensued. The lessee claimed that, because there had been two separate attacks, albeit coordinated and within minutes of each other, there had been two events, each of which should give rise to a full limit recovery.

The theory confounded a longstanding and fundamental principle of property insurance that the insured party cannot recover more than the value declared and insured. It had never been conceived the manner in which the damage was incurred could justify recovery of more than the amount of insurance the policy holder had purchased. The claim seemed a bizarre attempt to influence the social and political reaction to this unprecedented situation, and just incidentally to make the lessee's financial position viable.

Behind the startling claim lay an imaginative concept of the insurers' responsibility. The lessee's counsel based the double recovery theory primarily on a decades old New York case in which faulty construction work caused the collapse of a barrier wall between two separately owned subway lines, resulting in total damages to the two lines that exceeded the property insurance limit available to the owner of the structure involved

¹ Special Advisor to The Geneva Association, CEO of Liability Dynamics Consulting LLC.

in the collapse. In that obscure case from nearly a century earlier a court had determined that a single loss event justified property insurance recovery in excess of the policy limits because two different parties had relied on the sufficiency of those limits to protect their interests. The situation seems, even now, irrelevant to the World Trade Center loss. But it was exhumed from the dusty pages of property litigation reports and converted through the ingenuity of lawyers into a small hook on which to hang a new liability theory on responsibility. That creative legal alchemy has spawned major changes in U.S. and global liability conditions. Indeed the event preceded the development of the modern ubiquity of commercial liability insurance and the nuances of its responsibility for insurers. In effect, because one loss event damaged two innocent parties, the Court treated the property cover as if it had the characteristics we have come to associate with liability law and insurance. The case was an early illustration of the willingness of courts to innovate principles of insurance law when necessary to compensate innocent victims with no other source of recovery.

The World Trade Center (WTC) lessee relied on that case as precedent for conflating first party property and third party liability concepts. He asserted the same theory in the very different circumstance that he was the only victim of loss, which one would expect to defeat even this creative effort to achieve a double recovery. But the lessee combined the theory with a declaration that nothing in the terms of his property coverage specifically precluded his demand.

That ancient subway precedent, as applied in the WTC claim for US\$7 billion, launched what has in the past decade become an increasingly frequent and diverse application of liability law principles to distribute first party losses that would otherwise go unpaid. Liability law and the deep pocket of liability insurance are becoming the default resource for distributing the costs of otherwise uncompensated major loss events. The movement strains traditional principles of liability law. But in their own way, so did the evolution of asbestos and tobacco liability recoveries. The goal, now visible in a variety of forms, is to ensure the socialisation of otherwise uncompensated human tragedy on a mass scale.²

The next manifestation of this movement arose in the wake of hurricane Katrina in 2005. The damages and human misery of that event far exceeded the resources of property insurance. Liability claims were again invoked in situations that would not have been expected. Some were modestly innovative, such as suits asserting that the failure of dikes and barrier walls had been defectively designed or maintained, permitting greater flooding than might otherwise have occurred. Those claims used recognised liability principles in unexpected ways, in effect asserting that whatever damage nature at its worst can inflict should have been prevented. These claims ranged from the understandable to the preposterous.

But Katrina also spawned claims seeking to connect the severity of the storm and related damage to changes in global climatic conditions arising from the emission of greenhouse gases. While many had by that time accepted the scientific proposition that human behaviours since the industrial revolution had accelerated global warming and related changes in the frequency and severity of windstorms, Katrina generated the first large scale wave of liability claims seeking wind and flood damage recoveries from large CO₂ emitters. Until that time, it had been assumed that traditional conditions for liability recoveries, such as the need for proof of fault, breach of duty and a causal connection to

² Patton (2011).

the damage connection were essential conditions for establishing liability. None of those conditions seemed applicable to the misery of New Orleans, but the claims were asserted nonetheless.

At essentially the same time, in 2004 and 2005, similar expansions of liability law to the consequences of CO₂ emission claims were launched by both private and public sector claimants in the U.S. The most noted were suits by states and individuals against automobile manufacturers and energy companies. This cluster of claims sought to bypass the traditional liability law barriers by asserting that the act of causing CO₂ emissions was a “public nuisance”, evoking ancient common law cases rooted in personal behaviours that disturbed the peace and quiet of neighbourhoods.³

The greenhouse gas claims triggered by Katrina were a warning signal, but generated little damage recoveries. The public nuisance claims were initially derided as unsustainable, and indeed were all dismissed at their first tests. But, as was the case with asbestos and tobacco claims, appeals and persistence shifted the legal ground. Some of those matters were reinstated by appellate courts, and the potential applicability of public nuisance theories in climate risk events was given tentative approval by the U.S. Supreme Court. Other recent U.S. litigation seeks to apply liability via the theory of governmental breach of trust for protecting future generations due to failure to regulate and litigate against primary emitters.

In a surprisingly rapid evolution, the search for liability theories to distribute and socialise the cost of global warming has gone global. An Alaskan village invokes the aid of the courts to require globally significant emitters to compensate it, as melting glaciers require its relocation.⁴ The island nation of Micronesia seeks to prevent the Czech Republic from commissioning a large completed coal fired generating plant on the grounds that the Czech environmental impact assessment did not consider that the plant might accelerate the flooding of all the Micronesian islands.⁵

In the decade since its first modern manifestation in the WTC insurance litigation, liability theory has become the favoured tool of creative lawyers, economically strained governments and concerned NGOs to achieve the socialisation of mass losses arising from mass catastrophes.

The WTC claim did not cause all that has recently occurred in the expansion of liability theories. But it was a highly visible spark that accelerated the acceptance of the concept that if there is mass hardship for which adequate compensation is not otherwise available, liability theories may be shaped to compensate the victims.

I do not comment here on whether this is sound social policy. I note only that the movement seems likely to continue and escalate. Since liability law change is usually retroactively applied, this prospect should be of considerable concern to liability underwriters who can no longer fully assess the scope of benefits conferred on an insured at the time a policy is issued and priced.

But what became of that seminal event, the WTC claim to recover twice the insured value? In brief summary, the dispute generated years of litigation, two separate trials against separate groupings of insurers, and two conflicting outcomes in which part of the

³ Murray (2011).

⁴ RedOrbit (2008).

⁵ Kanter (2010).

market held its exposure to the insured values and the rest paid double the amount of their intended exposure.

The reasons behind this bizarre outcome also had a lasting impact on the way the market operates. The US\$3.5 billion tower of property insurance was the result of months of communications, conflicts and misunderstandings, culminating in the execution of multiple binders. Consistent with market practice of the time, much reliance was placed on the good faith of the participants, and on the opportunity to sort out the confusions through the post inception negotiation of contracts.

Unfortunately, Al-Qaeda didn't wait until all terms were clearly expressed. The disputed second limit was litigated on the basis of informal slips, inconsistent references to the insurer whose standard policy terms would control conflicts over what was said and what was intended but not recorded. The outcome was as disorderly as the policy formation process. I noted at the outset that the lessee asserted that his policies did not specifically exclude a double recovery. For many market participants, the Court held that to be true and controlling of the outcome.

The WTC episode was a wake up call for the industry. The traditions of informality and trust in binding coverage had to give way to the traditional care in contract formation that had long been the practice of other industries. Insurers and broker practices have rapidly and dramatically improved.

WTC should also have been a wake up call about the extent to which the legal costs of coverage disputes can distort underwriting results even when the insurer is successful. There are signs of improved understanding of the problem. But the reforms addressing the risk of legal expense are less significant than those relating to the reforms of policy formation. Regrettably, the belated realisation of the cost of defense still causes insurers to compromise sound coverage defenses. Omitting sound defenses, or compromising them in unduly expensive settlements is tempting in specific cases to avoid the additional costs of defense. But doing so frequently causes the expectations of claimants counsel to grow in other similar matters, and judicial perception of the merits of such defenses to decline. The result can be a significant escalation of the exposure of similar claims in the portfolio of all insurers. This "prudent compromise" approach to issues early in the tobacco and asbestos claims and contributed to the massive losses ultimately incurred by insurers. That is a lesson that needs to be applied to managing claims as new liability theories emerge.

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September 11: Might of the Moment— Enduring Effects

Patrick M. Liedtke and Christophe Courbage¹

Much has already been written on the September 11 attacks and its impact on our lives. The perspectives, from the political to the social, from the philosophical to the economic, are as diverse as the backgrounds and the motivations of their authors. The Geneva Association, taking—due to the nature of our research organisation—a strategic macroeconomic view of events, first thought that producing an overview of the impact of September 11 on the national insurance markets would be enough to complement the work that has been going on in other institutions and insurance companies. However, after receiving such extraordinary encouragement from many different quarters, including political and media ones, we decided that there was indeed a further role to play. We needed to highlight the key issues that the insurance industry has been, is and will be facing as a consequence of the September 11 attacks. We strive not only to research in abstract terms but also to create and disseminate a better understanding about the direct effects of the events themselves as well as their impact on the mechanisms of insurance and the relevance of insurance as a basic and fundamental tool in the organisation of our modern economies.

Following the huge success of the first special issue of our working papers “Etudes & Dossiers” related to the September 11 events—which was reprinted twice—we are now publishing a special monograph with the title *Insurance and September 11—One Year After: Impact, Lessons and Unresolved Issues*. It regroups the updated and in some cases extended contributions of the first issue. With hindsight we can say that, almost a year later, the general picture is somewhat different. This corresponds to part one of the monograph. Part two looks at specific lines of business from a company perspective and discusses what the key issues and problems are. In the final third part, the contributions deal with systemic questions linked to the event and draw a broader picture of where we are still facing unresolved issues. At the very end we have included a contribution in the form of a postscript that takes a much broader view.

Some things are unthinkable until they happen—and then they rest as an enduring imprint in the collective memory of humankind. September 11, 2001, has been a day that profoundly marked the history of the United States and of the whole world. The general suffering, the loss of thousands of human lives and the thoughts and images it has provoked will stay in our minds probably for as long as we live. For the insurance

¹ Patrick M. Liedtke is Secretary General and Managing Director of The Geneva Association and Christophe Courbage is Head of Health and Ageing and Insurance Economics Research Programmes.

industry, it has proven to be the most expensive event in history. As of today, it is still difficult to assess the financial insured loss. Yet, it is largely assumed that the costs for insurers worldwide could amount to approximately US\$40-50 billion. As a sinister comparison, the second most expensive catastrophe, Hurricane Andrew, is estimated to have caused losses of US\$20 billion (in today's dollars), less than half the amount of the losses on September 11.

Following this dramatic event, the insurance and reinsurance industry have been facing some important challenges to their capacity. At the time when this introduction was written, it seemed that the large majority of the risk carriers involved would be able to meet their obligations. This is remarkable as there was not a single premium dollar set aside specifically for such an event, which figured in no insurance scenario. Plus it probably amounts to well over twice the sum for the most expensive event ever in the history of insurance claims, and this at the end of an extended soft market.

In insurance, risk coverage is usually given (sold) under specified circumstances for suffered losses due to *ex ante* defined improbable events. Understanding the frequency and severity of a potential claim and when and how the losses that arise from an insured event are to be compensated is a necessary precondition for sound insurance business. More information, more efficient tools and instruments will improve the understanding why, when, where and how certain events happen. This leads to better business models for insurers and their clients. We are, however, from time to time confronted with events that we would have qualified *ex ante* as impossible, unrealistic or that we were simply unaware of—the unthinkable. The use of jumbo jets as flying bombs crashing into the former Twin Towers of the World Trade Center in New York City is such an event. It is an event that under the terms and conditions of many insurance policies qualifies for compensation, regardless of the lack of understanding or foresight at the time the contracts were negotiated that such an occurrence could ever take place.

The future costs of any claim have to do with uncertainties, probabilities and finally risk management in a dynamic sense. The price determined in a contract at any given moment expresses a reasonable probability at best, but more often than not previous experiences extrapolated into the future. A new experience then triggers a readjustment in the markets through two mechanisms: the adjustment in premium due to a better comprehension of the vulnerabilities associated with an insurance contract and, if the readjustment follows a major event with a big capacity reducing effect, a temporary recapitalisation effort to adapt again the reserves of the risk carriers. The new information is then absorbed. How the (new) risks associated with terrorism will penetrate the insurance markets in the longer term has still to be seen, the short-term impacts are well described in the contributions in this monograph. That the event of September 11, 2001 has triggered a move towards a new equilibrium in the markets and a certain recapitalisation effort is obvious. Furthermore, very importantly, it leads to a deeper rethinking of the insurance mechanisms.

It is clear that the terrorist attacks have led to a shift in conceptions of the sheer magnitude of a potential loss. The losses on September 11 were important indeed, involving extraordinary cumulative consequences. The concern is no more to know the probable maximum loss but to evaluate the possible maximum loss as well. Or put in other terms: risk exposure does not end with the often arbitrary cut-off point of the normal distribution

curve. However, at the very end of the distributional function there lie risks that go beyond the capacity of private risk solutions.

Disregarding a modern and efficient insurance sector, the ultimate uninsurable risk has to be borne by society. Insurance can only operate within the limits of insurability. These limits are defined not only by a finite insurance capacity, but also by other parameters. The risks can be of a very minute nature and hence do not lend themselves to a transfer since the associated secondary costs would be too high. There are costs of repairs or simple maintenance, which like other occurrences, do not qualify as uncertain events. Problems of anti-selection and moral hazard might prevent insurance solutions, as could asymmetric information. Another problem is that the level of uncertainty might become so high as to be rationally unmanageable. In some of these cases, dealing with such vulnerabilities can be only taken over implicitly or explicitly by society at large. We need not only to better understand where those limits of insurability are and how we might be able to influence them, i.e. push them back so that market mechanisms can take hold, increasing the efficiency of the economic system. We also have to rethink the role that the nation states play as a potential “insurer of last resort”.

The airline industry suffered not only the loss of four airplanes (which were insured) but more importantly in the immediate aftermath of the attacks a severe blow to their business as a result of a general temporary halt in air traffic in the U.S. and the subsequent reduction in travelling. Some of that cost has been and will be compensated undoubtedly through insurance. When approaching the point of insolvency, some carriers were helped by the injection of state funds.

One of the questions to answer will be how the state, if and when acting as an insurer of last resort, should complement the functioning market place. How far does this provide a call option with a strike price to be variably set by the beneficiary in the form of underinsurance and heavy or “managed” exposure? Furthermore, does it make sense in a globalised world for a single state to bail out a company with capital owners, employees, customers and dependent suppliers in many different countries? Is the state really such a good insurer of last resort or do we need another system to complement what we cannot (or do not) want to organise in the market place? And where does the legal system draw the borderline when analysing the consequences of the event and the extent to which any party in the world might be affected? (As a side-thought: Business people in Asia have asked their employees to specify any sort of cost that might have been caused—however indirectly—by the tragic events.) Let us extrapolate into the absurd for the sake of the argument: Can the flap of a butterfly change the climate thousands of miles away? And who is liable for the consequences if the resulting hurricane destroys hundreds of homes?

A central question is how to ensure the provision of future cover for insurance and reinsurance risks—including liability issues. Several countries have followed the British example by setting-up some kind of government-backed solution or pool. Such a pool is generally built up to a certain amount through private capacities and above that limit, it is backed by a state guarantee or another public mechanism that ensures that bigger risks are also covered.

The current discussions in so many different countries on how to best use our knowledge in devising the most efficient private and public partnerships will stay with us for a while.

Our present understanding of the highly complex interactions of risk management and transfer issues is still inadequate. More advancements in this terrain will create a better and more efficient environment for our economies and ultimately societies.

At the same time, the September 11 events have highlighted another important issue: regardless of the importance of the insurance industry for the functioning of modern economies, its role and the mechanisms it uses are unfortunately too often only poorly understood by the public and its political agents. In some instances even the informed media has contributed to a confusion of concepts and tools. The questions “Why do we need insurance in the first place?” and “What conditions are necessary for its efficient operation?” have to be answered publicly and with vigour. It is not the role of The Geneva Association to lobby on behalf of the insurance industry—there are many organisations purposely created to this end—but our research, especially in the aftermath of September 11 where insurance questions came to the forefront of public concern, shows that the general level of understanding about insurance is not befitting our modern societies. We therefore try to help create the new knowledge and further the networking of those who can contribute to a deeper comprehension.

One of those aspects is that while insurance—even after such a huge and sudden surge in damages as in 2001—generally is not a major source of financial instability (as we will see in the following chapters and as underlined in the IAIS publications on September 11, the global insurance industry is in good shape), the absence of insurance creates enormous problems. It was precisely the unwillingness of insurance companies to continue to underwrite the existing aviation policies (for the same premium) that created the necessity for governments to step in and guarantee cover for terrorist attacks. In a risky environment where no reliable (or at least to an operational degree reliable) assumptions can be made on the probability of insured events happening, insurance has and must have the right to opt out. Nevertheless, exactly this very precondition for a private market solution through insurance, and sound operation of insurance, can create financial instability. The private market solution to individually unbearable risks, which we call insurance, has to be complemented by social mechanisms to guarantee its continued functioning and avoid financial instability that could spread through the whole economy. Regulators and legislators are working with insurance companies to solve this problem and find the most efficient solution.

However, there are other aspects that are troubling insurers (and their investors and clients, indeed the whole economy) and that is the pronounced slump of stock markets. The damage done to the balance sheets of insurance companies due to the fall in the value of their investments over the past year and a half has destroyed much more claims handling capacity than the tragedy last September. It seems that the times when underwriting results could be reinforced through investment returns are over, at least for a while. This combination leads to more risk adjusted capital management on both sides of the balance sheet, more prudent (some would even say stringent) insurance underwriting and an increase in insurance premiums.

Almost one year after the September 11 events, we thought that it was important to identify the various challenges to the insurance industry the world over. We have asked experts from insurance companies, the major national insurance associations and other organisations to write articles describing and analysing the economic consequences of the terrorist attacks and discussing the key issues for the future. The result of their endeavours

is this monograph. The Geneva Association is very grateful to all the authors for their contributions.

Geneva, August 2002

Patrick M. Liedtke
Secretary General and Managing Director

Christophe Courbage
Head of Research Project

About the authors

Peter Buetikofer is a Managing Director and the Head of Property Centre Reinsurance at Swiss Re. He joined Swiss Re in 1983 as an actuary working in the facultative property reinsurance area in Zurich. Later on, Peter Buetikofer assumed various positions in property underwriting, single risks and treaties over all geographies. In his role as Product Manager Property, he spent two years in Munich for Swiss Re. After having managed a worldwide team of risk engineers, he was appointed head of Property Centre Reinsurance, steering the property reinsurance portfolio by various means including looking at large deals, be it facultative or treaty reinsurance. Peter Buetikofer was born in 1958 and is a Swiss citizen. He has a degree in actuarial science and statistics from the University of Bern. He joined Swiss Re immediately after his studies and has stayed with the company ever since.

Christophe Courbage, PhD in Economics, is Research Director at The Geneva Association in charge of the Health and Ageing and Insurance Economics research programmes. He is also Deputy Editor of *The Geneva Papers on Risk and Insurance—Issues and Practice* and International Faculty of the Singapore College of Insurance.

Mr Courbage has lectured at various universities such as the University of Lausanne, the University of Geneva and the University Saint-Joseph of Beirut. Christophe is the former Executive Secretary of the European Group of Risk and Insurance Economists (EGRIE). Prior to joining The Geneva Association, Mr Courbage worked for the Geneva-based private bank Lombard Odier & Cie, as an Economist, first in the London office and then in Geneva in the strategic research department. During his PhD, Christophe was research assistant at The University of Geneva and the Catholic University of Mons (Belgium).

Patrick M. Liedtke is Secretary General and Managing Director of The Geneva Association. Having studied Electrical Engineering and Economics in Germany and England, he began his career in capital markets analysis and economic research in England, Germany and Switzerland. He joined The Geneva Association in 1998 and in January 2001 was appointed Secretary General and Managing Director.

Patrick Liedtke is also a Surveillance Board Member of Zwiesel Kristallglas AG, Zwiesel, and a member of the Advisory Council of Deutsche Insurance Asset Management (Deutsche Bank); he is also a member of the Club of Rome, having served two terms on its Executive Committee; a member of the World Academy of Arts and Sciences; a member

of the Advisory Committee of the Wharton School's Center for Risk Management and Decision Processes (WCRMDP) in Pennsylvania; and of the International Advisory Board of the China Center for Insurance and Social Security in Beijing, as well as several other expert groups.

In addition to his role as Secretary General, Patrick Liedtke is the Editor-in-Chief of *The Geneva Papers on Risk and Insurance—Issues and Practice*, published in London; a Board Member of the European Group of Risk and Insurance Economists (EGRIE); a Director of the Applied Services Economic Centre (ASEC) in Guelph/Toronto and Chairman of the Silver Workers Institute in Geneva.

With nearly 40 years' engagement with the general insurance industry in Japan and abroad, **Katsuo Matsushita** has a wide range of experience in handling insurance business and regulatory issues. He started his career by working for The Tokio Marine and Fire Insurance Company ("Tokio Marine"; currently Tokio Marine & Nichido Fire Insurance Co., Ltd.) where he was in charge of, among others, international and corporate planning. He worked for The General Insurance Association of Japan (GIAJ) as General Manager from June 2002 to June 2009.

Mr Matsushita's role at The Geneva Association is to engage with insurance companies and other industry stakeholders present in Japan and East Asia on behalf of the Association, to provide local representation at conferences and other industry events and to provide special advice to The Geneva Association on its activities in the region.

Mr Matsushita has also been Member of the Executive Board of the East Asia Insurance Congress (EAIC), from 2002 through 2008, and Member of the Judges Panel of the Asia Insurance Industry Awards from 2004 through 2006.

Mr Matsushita holds a Bachelor of Arts (Law) degree from Tokyo University of Japan.

Corporate and professional and financial liability issues have been at the core of **Richard Murray**'s career in law, accountancy, insurance, capital markets and consulting. He is currently a Special Advisor on liability and legal matters to The Geneva Association in Switzerland, Chairman Emeritus of the Center for Capital Market Competitiveness in Washington, CEO of Liability Dynamics Consulting in New York, and a Director of the Center for the Study of Financial Innovation and of Oxford Analytica, both in the U.K. He was a member of the U.S. Treasury Advisory Committee on the Auditing Profession (2006-2007) and the Bi-Partisan Commission for the Capital Markets (2005-2007) His most recent employments were as Chief Claims Strategist for Swiss Re (2002-2009) and as Global Head of Legal and Regulatory Affairs for Deloitte (1994-2002).

Mr Murray was educated at Harvard College and Harvard Law School. He served for a decade as a Director and member of the Executive Committee of The Institute for Management Development in Lausanne.

Fabrizio Ortolani is an analyst at the Research and Development Department of Assicurazioni Generali, where he is involved, among various other tasks, in the analysis and forecasting of several European insurance markets. Mr Ortolani studied at the University of Trieste, where he graduated in Economics and obtained a MSc in International Economics with first class honours. His major field of expertise is in Econometrics. He

is fluent in Italian and English, he speaks Danish at an intermediate level and has a basic knowledge of French, German and Spanish. Before joining Assicurazioni Generali, he was an intern at the Economic Affairs Office of the Italian Embassy in Oslo, Norway.

Lorenzo Savorelli is Head of Research and Development of Generali Assicurazioni Group. Entrepreneur, manager, diplomat, accomplished economist and financial specialist, he studied and taught economics, econometrics and finance at Bocconi University in Milan, and New York University in New York, and attended Harvard Business School Executive Education Degree Program. He is an expert among others of macroeconomics, finance, applied econometrics, international and development economics, the insurance sector and pension issues.

Lorenzo Savorelli has spent 17 years in the U.S., as Executive Director Assistant with Dr Mario Draghi, and then Senior financial specialist at the World Bank, as well as two years in Cairo as Italy's financial and diplomatic representative with the Italian Ministry of Foreign Affairs and Treasury in the MENA Bank Transition Team. He then headed the Financial Institutions Group at BNP Paribas Italy, and subsequently ran an independent consulting group active in insurance and pension advisory internationally before joining Generali in 2007, where he has been leading for the last four and half years the Group's Research Department, focused on insurance analysis and forecasting, macroeconomics and finance, and directly reporting to the Group's top management, providing direct advice to the Group's CEO and MD.

Kai-Uwe Schanz is Chairman and Principal Partner of Dr. Schanz, Alms & Company, a Zurich-based business development and communications consultancy. He has been a Special Advisor to The Geneva Association since 2007. From 2004 to 2007 he served as Head Communications & Corporate Strategy at Converium, a former Global Top 10 reinsurer. From 1995 to 2004 Kai-Uwe Schanz worked for Swiss Re, a leading global reinsurer, performing various senior management roles such as Chief Economist Asia-Pacific, based in Hong Kong, and Head Communication Content & Channels, based in Zurich. He has published extensively in national and international business and trade titles. Kai-Uwe Schanz holds a PhD degree in International Economics from the University of St. Gallen. He is a Swiss and German citizen.

Gordon Stewart is Liaison Officer North America for The Geneva Association. He is Vice Chairman of the International Insurance Society and Chairman of the Pension Plan for Insurance Organizations. He served for 15 years as president of the Insurance Information Institute. Prior to that he was Deputy Chief Speechwriter for President Carter, Executive Assistant for Programs and Policies to New York Mayor John Lindsay, and Vice President of the American Stock Exchange for Arthur Levitt. He heads the Society of Presidential Speechwriters, and is a life member of the Council on Foreign Relations and a founding member of the National Bureau of Economic Research insurance research project. He is a graduate of the University of Chicago and Yale University.

Freddy Van den Spiegel is Economic Advisor to BNP Paribas Fortis, as well as consultant and free lecturer on Geopolitical issues, European Integration and Financial

Regulation, and Professor at the Free University Brussels in Financial Management, Financial Markets and Financial Institutions. He started his career as Assistant Professor at the Free University of Brussels and has worked for such international companies as ASLK, where he worked in Marketing and Asset Management, Fortis Bank, where he was Chief Economist, and then moved on to BNP Paribas Fortis in 2009, where he went from Chief Economist to his current position.

Prof. Van den Spiegel is also Chairman in several groups and committees working on economics, regulation and supervision, such as the Steering Group “Regulation and Supervision” of the European Financial Round Table (EFR), or the Global Banking Industry Committee of the European Banking Federation. He was born in Belgium in 1952 and holds a PhD in Economics from the Free University Brussels.

Steven N. Weisbart is Senior Vice President and Chief Economist for the Insurance Information Institute. Dr Weisbart oversees the Institute’s programme for Economic Research and Analysis, preparing studies in support of the organisation’s communications mission, speaking to media and conducting briefings for member companies, industry organisations and public policymakers. A specialist in annuities, pensions, and life, disability and long-term care insurance, Dr Weisbart frequently also makes presentations on property/casualty issues to industry audiences, as well as legislative forums.

Dr Weisbart is an Adjunct Professor at the School of Risk Management, Insurance, and Actuarial Science in the Tobin College of Business at St. John’s University.

Paolo Zanghieri is Senior Analyst at the Research and Development office of Assicurazioni Generali, where he is in charge of economic analysis. Previously Mr Zanghieri was Senior Economist at Oxford Economics, a leading macroeconomic consultancy based in London and Oxford. Mr Zanghieri has also worked in Italy (Rome and Bologna) and France (Paris) in the fields of macroeconomic forecasting and policy analysis, applied econometrics and insurance economics. He has published in academic journals articles about international macroeconomics and insurance economics. Mr Zanghieri graduated with first class honours in Political Science at the University of Bologna and has an MSc in Economics from Universitat Pompeu Fabra, Barcelona.

Publications of The Geneva Association

*For a complete list of our publications and how to get them,
consult our website at www.genevaassociation.org*

Books and monographs

The Future of Insurance Regulation and Supervision—A Global Perspective

Edited by Patrick M. Liedtke and Jan Monkiewicz, Palgrave Macmillan, April 2011.

The recent financial crisis has provoked a broad spectrum of regulatory observations and possible responses. Currently most of these proposals have been quick solutions to politically pressing questions and often only address parts of regulatory systems, but not the whole. At times, the result has been more confusion than clarity. Although historically wide-ranging reshaping has been a common phenomenon after the severe failure of an existing financial infrastructure, there is an important difference this time—the global reach of today's markets and enterprises. Moreover, never before have so many reforms following a banking crisis not only affected the banking sector but also other parts of the financial services sector, such as insurance, the social systems and, of course, our real economy.

Written by leading academics, researchers and insurance industry experts, this book offers a diversified perspective on how the regulatory and supervisory framework for the insurance sector will develop over the coming years. It is supported by The Geneva Association, the world-leading think tank of the private insurance industry.

Considerations for Identifying Systemically Important Financial Institutions in Insurance

Edited by Daniel Haefeli and Patrick M. Liedtke, The Geneva Association, Geneva, April 2011

The Geneva Association's efforts in the field of financial stability in insurance continue with this report which addresses two fundamental areas that are currently occupying policy-makers' and regulators' agenda: in Part I "A Methodology to Identify Systemically Important Financial Institutions (SIFIs) in Insurance", and in Part II "An Analysis of the AIG Collapse: understanding systemic risk and its relation to insurance".

The methodology presented in Part I is a logical further development of the earlier work carried out by The Geneva Association. It is inspired by the need to develop a comprehensive approach to identifying potentially systemically risky activities and the entities that carry them out.

Part II provides an analysis of the AIG case, which regularly features prominently in discussions about systemic risk and insurance and which is often misunderstood. The analysis aims to provide more clarity on this oft cited example and sets it in the wider context of systemic risk issues and their relationship to insurance.

Key Financial Stability Issues in Insurance—An account of The Geneva Association's ongoing dialogue on systemic risk with regulators and policy-makers, Follow-up report on Systemic Risk in Insurance

Edited by Patrick M. Liedtke and Kai-Uwe Schanz, The Geneva Association, Geneva, July 2010.

This report is based on a series of background papers and special presentations on systemic risk in insurance created between March and June 2010. It summarises the insurance industry's thinking—as advanced and crystallised by The Geneva Association—on these areas which include both corporate activities (e.g. asset management) and regulatory measures (e.g. crisis resolution mechanisms).

The Geneva Reports—Risk and Insurance Research

No.3: **Anatomy of the credit crisis—An insurance reader from The Geneva Association**
Edited by Patrick M. Liedtke, January 2010

In this special Geneva Report, The Geneva Association has assembled a series of key articles written during and on the subject of the credit crisis, compiling them into an insurance “Reader”. This Reader provides an insight into the credit crisis from an insurance point of view, looks at its impact on the insurance industry and finally examines the episode for lessons-learned and concerns that remain. The majority of the articles were written during the crisis and have been published unchanged in order to give a true insight into how thinking developed as the crisis unfolded.

With articles unchanged from the time of writing accompanied by a highly detailed timeline, the Geneva Report No 3 provides a very real anatomy of the credit crisis, the lessons learned from it and the implications it has for the insurance industry in future.

No. 2: **The insurance industry and climate change—Contribution to the global debate**,
The Geneva Association, July 2009

No.1: **Regulation and intervention in the insurance industry—fundamental issues**
E. Baltensperger, P. Buomberger, A.A. Iuppa, B. Keller and A. Wicki, February 2008

Newsletters (also available as e-newsletters)

- **Insurance and Finance** deals with research activities in the fields of finance where they are relevant to the insurance and risk management sector.
- **PROGRES** contributes to the exchange of information on studies and initiatives aimed at better understanding the challenges in the fields of insurance regulation, supervision as well as other legal aspects.
- **Risk Management** summarises The Geneva Association’s initiatives in the field of risk management and is open to contributions from any institution or company wishing to exchange information.
- **Insurance Economics** which serves as an information and liaison bulletin to promote contacts between economists at universities and in insurance and financial services companies with an interest in risk and insurance economics.
- **Four Pillars** provides information on research and publications in the field of social security, insurance, savings and employment.
- **Health and Ageing** brings together facts and figures linked to health issues for people aged 50-80 and productive ageing, to try to find solutions for the future financing of health.
- **World Fire Statistics.**
- **General Information.**

The Geneva Reports

Risk and Insurance Research

No. 4 • September 2011

Ten years after the terrorist attacks of September 11, 2001 The Geneva Association has initiated a comprehensive research effort focusing on the lasting impact of an event which was the most expensive man-made disaster for insurance ever and which in its immediate aftermath was widely viewed as heralding a new era in global politics, economics and business. This effort builds on The Geneva Association's seminal special monograph *Insurance and September 11—One Year After: Impact, Lessons and Unresolved Issues* which, written and published in 2002, has proven remarkably prescient in many respects.

With the following collection of eight essays from leading industry economists, underwriting specialists and Geneva Association researchers, we intend to make a meaningful contribution to establishing the event's permanent relevance for the world of risk and insurance. We also hope to stimulate our readers to consider the long-term development of the insurance industry and the various ways in which it is intertwined with human lives and activities.