INSURERS' RESPONSE TO THE CHANGED NATURE OF RISK

Suwanna Kitseree[1], Brian Lawrence[2]
Faculty of Risk Management
Assumption University of Thailand, Bangkok

Abstract

The insurance function is to spread across a wider community the loss suffered by insured victims, thus enabling individuals to get on with their lives and enabling organisations and nations in their struggle for economic growth. Insurance is a method of financial reimbursement, but is also part of the wider field of Risk Management which includes evaluation of risk, loss control, and financing of risk.

This relief to victims of misfortune, through reimbursement of financial loss, has been developing for centuries, the experience producing tested processes and techniques which change over time. But in this decade awful events have occurred on a scale not previously recorded. Hurricane Katrina in USA in 2005 is the costliest insurance event on record, greater than the previous record of the terrorist use of aeroplanes as bombs in USA in 2001. There is an expanding universe of risks, and a definite increase in natural disasters. The nature and scope of risk is changing rapidly, and is sorely testing the ability of the insurance community to keep pace. The challenges are insurability, solvency/capacity, and the human resources needed to match these challenges with their skills and plans.

This article will describe the changing nature and extent of risks, and what is being done, and could be done, to meet the challenges.

Introduction

Violence and disaster have always been part of the human situation, but this first decade of this new millennium is increasingly disaster-prone. Earthquake and Tsunami, Storm and Flood, Disease and Virus are our fears in addition to man-made disasters including terrorism. Perhaps

[1] Suwanna Kitseree BBA, MSI, is Chairperson of the Property & Casulaty Dept., in the Faculty of Risk Management.

[2] Asst. Professor Brian Lawrece is Director of the Research Centre in the same Faculty.

it is because the world has grown smaller due to sophisticated communications, informing us almost as soon as disasters occur, and we can see the gory detail on television. But global warming is also a factor. The insurance community has responded well, so far, but the challenge has only just begun.

Financing risks is only part of risk management. Identifying and implementing ways of managing those risks both before and after loss is as important (and since the Twin Towers disaster is probably seen by many organisations as more important). "The revolutionary idea that defines the boundary between modern times and the past is a mastery of risk" (Bernstein,1996:1). This is the idea that the future is more than a whim of the gods, and that humans need not be passive towards nature's threats, that they can indeed exercise some management and control.

The capacity to manage risk is a key element of the energy that drives the economic system forward. Risk Management is a set of activities to evaluate and then lower the probability of risk, in frequency and severity (as well as making decisions about financing risks, of which insurance is only one method).

This article will describe the awful emerging risks, the need to improve risk management techniques, the challenge of what to do about the limits of insurance, and the need for more practitioner skills to handle the field of risk in the next decade (beyond that is too far to see, the world is changing so quickly).

The New Nature and Scope of Risks

The rapid changes in our world, through globalisation, technology, and climate change, have inevitably affected insurers, and risk management. Risk itself seems to have changed its very nature. As Bernstein (1996:329,330) describes it: "Discontinuities, irregularities, and volatilities seem to be proliferating rather than diminishing ... and even the planet Earth itself appears to be under attack from enemies never before encountered".

Kessler (2001), writing before the terrible events of September 2001, talks about an expanding universe of risks: new ones appear at a faster rate than old ones disappear. His categories include: Multiplication of risks caused by new technologies; new economic activities; chain effects; complex cluster effects; mass effect (eg urban concentration), and mass transit). Risks are increasingly endogenous; gradual (illnesses); they last longer and effects are sometimes irreversible. Risks are increasingly correlated, interdependent; they are increasingly foreseeable and less random.

The repeated experiences of awful weather has made us aware of distinct change. This de-

cade. wind speeds have reached peak levels, plus the strongest hurricanes ever, with tropical cyclones and storms appearing in regions, including Europe, which have never before experienced them. These exceptional meteorological events are unsettling developments (Munich Re and American Re, 2006). Large reinsurers which bear the financial brunt of natural disasters are warning that rising global temperatures will make floods and hurricanes more common across the world.

There are sociological issues involved. Risk is very much a matter of perception, how a risk is perceived, and thus includes many subjective factors. The risk thermostat of the average citizen "is being recalibrated as the new millennium progresses" (Nichols, 2004, p39). Television daily shows citizens immediate and actual images of disaster, and risk is seen as more threatening and inevitable, yet somebody is expected to do something, and especially governments. Hazard realization by its citizens has thus become an important influence on governments, who naturally worry about national budgets and tax increases and therefore re-examine the role of insurers.

The changing nature of risk puts pressure on the ability of insurers to cope, it makes them vulnerable. This impact, pushing insurers up against limits, will now be addressed, and then some solutions will be considered.

Vulnerable Insurers Against Limits

The terrorist attack on USA on 9th November 2001 was then the most expensive event in history. "No other event has tested the functionality of the insurance system to such an extent" (Liedtke, 2006: 31). It is not only the vast amount paid in claims, but it represents "a new kind of event which highlights some of the vulnerabilities and limitations of our economic, financial and, consequently, insurance systems". It raises questions about the limits of insurability, and the role and responsibilities of the insurance sector.

Insurers and reinsurers were able to pay the enormous claims for the September 2001 event, even though they had set up no reserve fund for such an event. Nobody had imagined that such an event was remotely possible.

Hurricane Katrina in US in 2005 is the costliest insurance event on record at $60 billion, greater than the previous record of World Trade Centre in 2001. The 2005 hurricane season was very costly for insurers, and 2004 was also bad.

The SE Asia Tsunami in December 2004 and the Pakistani earthquake in 2005 were in areas where insurance penetration is low [so other assistance was essential, and insurance claims were low].

Man-made and natural disasters and pandemics mean that the 'many insure, few claim' principle no longer applies (Piesse, 2006). Also, the traditional notions of reinsurance no longer apply: a pandemic could last 3 months, and 30-50% of people fall ill.

There are three aspects to the limits of insurance through its vulnerability in the face of such risks: Solvency of the Insurer, Uninsurability of Risks, and the Skills and Plans of insurers.

Solvency of the Insurer

Insurers are required to maintain an excess of assets over liabilities, not less than a solvency margin set by a government regulator in each country. It represents a safety margin, the capacity of their funds to pay claims. It is thus related to their Capital and Reserve Funds. The margin formula and techniques differ from country to country, and in some countries are very basic.

9/11 was a major test of solvency for insurers. Some reinsurers went out of business, and some were downgraded by rating agencies. A Conference in September 2006 warned of capital inadequacy in the insurance industry, by $80 billion in USA alone (Miedema, 2006). A rising number of ever more costly natural catastrophes and more stringent demands from rating agencies are the reasons.

As to the purpose of risk assessment, Blong (1997: 137) asks, rhetorically, "Is the concern solely with PML estimation or is the bottom line also important?" Is the purpose "to assist in maximizing the return on shareholders' funds and/or ensure directors' duties of care are not compromised? Yes."

The insurance industry in Asia has been lucky for some years or even decades now as, in spite of tragic human losses, only areas of low density were involved, but should a serious earthquake convulse Tokyo the consequences would be felt all over the globe. Many insurers who sell insurance for cash-flow reasons rather than rational statistics and probabilities will collapse, throwing the burden onto society at large (Trumpp, 2006).

In Japan, because a huge catastrophe occurs every 5, 10, 20 years, it is important that financial reserves be set aside every year so that sufficient funds are available when the catastrophe happens. Since 2005 insurers must establish an annual catastrophe reserve fund, statistically calculated against the potential large loss instead of being based routinely on a percentage of the premium income (Kawachimaru, 2006). The regulatory authority, the Financial Services Authority, checks these calculations and other factors (such as ensuring that 'unearned premium' reserves are also adjusted for natural disasters). 'Reserving' is a complex but essential part of insurance accounting (which has many differences from ordinary accounting), and some countries and some insurers are notorious for under-reserving, which makes their annual

accounts look good but puts them at risk of insolvency in a bad year. Some countries are not well regulated and even though there may be regulations they are not properly enforced.

There is the risk of an Avian Flu pandemic. "Reinsurers could drop faster than people" (Piesse, 2006), as surveys show the financial services industry is very poorly organised. Insurers could go bankrupt, and the claims response would thus become very slow. There are many challenges for the insurers regarding the potential Avian Flu pandemic. This particular threat is outside the normal insurance realm of risk. There is no significant conventional capacity, either insurance or reinsurance for this. Limited covered is offered by some US insurers at unacceptably high premiums. Reinsurers have excluded all possibility of an Avian Flu claim. There are some possible alternatives sources of financing these risks, e.g. a blend of net capital with 'on demand' bonds, and Contingent Capital (Steingold, 2006).

The global impact of an Avian Flu pandemic could seriously affect life reinsurers, and even a pool might not be sufficient, warns a rating agency Standard & Poors in 2006, but admits that estimates are uncertain (Asian insurance Review, July 2006, p39).

An adverse effect too on insurers' employees wrecking their ability to deal with claims. There is thus a need for contingency plans for a distributed workforce (work-from-home), with appropriate tools, training, telecoms, information, network strategy (Piesse, 2006). Some companies have BI (Business Interruption) insurance (sometimes called Business Continuity Protection insurance). Also a Supply Chain effect: a huge impact on rail/road and people movements. Outsourcing to other countries may not function.

The global warming risk could make many risks uninsurable, because of adverse selection (asymmetric information) and the potential catastrophe cost could far exceed the financial capacity of insurers and reinsurers. We now turn to the uninsurability aspect of insurers' vulnerability.

Uninsurability of Risks

The extraordinary cumulative consequences of jumbo jets used as bombs against such targets now forces organizations and insurers to consider not only the probable maximum loss but also the possible maximum loss from events. Now it is realised that "risk exposure does not end with the often arbitrary cut-off point of the normal distribution curve" (Liedtke, 2006).

Risks which were previously insurable are now considered not so, including some weather risks, major public events, as well as those such as terrorism which could be insured for a price and with many restrictions and was not business sought by insurers.

"Changing demographics and the need for more homes and businesses have seen the industry's exposure to natural catastrophes exceed the current cost models as in recent hurricane seasons in USA. The problem is how to approach those risks which were previously seen as uninsurable", such as Major Events (Football World Cup, Olympic Games (Hannen, 2006). In 2002 FIFA went to the bond market when the liability insurer pulled out because of terrorist threats in the Japan and S. Korea world Cup events. Such events can take 3-5 years for an insurance package to be put together, the risk profile changing in that period - new risks emerge.

There is a dark side to insurance, in that it can produce 'morale hazard', insured people and businesses may become less careful in preventing loss now that they have financial protection. In other words, they are 'insulated' from risk (Lawrence,1997: 234). For example, premiums for catastrophe insurance are increasing and may become too high to be generally affordable, but insurance which is too readily available could lead to unwise use of land and those previously inhibited from building in known flood plains, for example, would now not feel restrained (Lo, 2006). This is precisely what has been happening in Britain over the last 20 years, resulting in many more flooded homes, to the extent that premiums have risen sharply, and cover is unobtainable in some districts. The premium system uses postcodes which identify those houses most at risk. Local Authorities which gave permission for such buildings are now much criticized.

There is another side to uninsurability: the reluctance of some who are at great risk yet do not buy insurance. Japan is beset with every kind of natural disaster, and insurance products have usually emerged as a result of major disasters as they occur. Earthquake insurance on private dwellings is actively promoted by insurers and the government, reminders being sent to those householders who are still uninsured (Kawachimaru, 2006).

The Philippines is another disaster-prone country, with about 900 earthquakes, and 25 typhoons, each year. It has 220 volcanoes. Yet it is estimated that 90% of residential and over 50% of commercial buildings are not insured against earthquake, and there are few insurance policies covering natural perils (Jacinto, 2006).

Perhaps those who do not buy insurance cannot afford it, the poor. There are interventions by governments in some countries, including Thailand, to make some insurance products available, cheaply, to those on low incomes (Lawrence, 2005).

Some Solutions: Pools and A.R.T.

Ultimately, uninsurable risks have to be borne by society. We need to better understand where those limits of insurability lie, and how they can be pushed back, and to consider the

role of governments as insurers of last resort (Liedtke, 2006).

There are two main solutions to the problems of solvency limitations and uninsurability: Pools, and Alternative Risk Transfer (ART). A 'pool' can be set up by many insurers, to spread the risk. Often the government acts as insurer of last resort through a government-backed guarantee for sums higher than the limit which insurers set as their pool limit of insurability (Hannen, 2006). A Pool thus acts as a threshold for government participation, as well as an industry level formula for retention and deductible (Piesse, 2006).

China is planning an earthquake pool, but so far only a tiny fraction of China's potential exposure to natural disasters is insured (Hahn, 2006). Healthcare pools need to be established, similar to pools for terrorism (Piesse, 2006). Terrorism cover is available through pools in UK, France, Germany, Spain, Netherlands, Australia, USA. They are different in the details, but all are a government/insurer partnership. The model was the terrorism pool set up in UK during the Irish bombings.

Another method is to add the government guarantee to reinsurers. In Japan, earthquake risks are ceded by insurers to a private company, Earthquake Re Japan, which then retrocede about 80% of the risks to the government and the remainder to insurers (Kawachimaru, 2006).

Or a reinsurer can be established for specific risks only. Indonesia since 2004 has a special risks reinsurer, PT Assuransi Maipark Indonesia. It is the national reinsurer for catastrophe risks, and is a joint undertaking by all licensed insurers and reinsurers. It sets benchmark pricing for earthquake risks, and is building a statistical data base for earthquakes and other special risks (Jacinto, 2006).

Alternative Risk Transfer products (ART) emerged in the 1980s, gaining respectability since 1997, especially Catastrophe Bonds (CAT Bonds). These are available where issuers pay a high yield in return for not having to redeem the paper in case a major predefined disaster happens. CAT Bonds are an alternative risk transfer instrument for insurance and reinsurance companies to help them pass portions of their catastrophe risk exposure into the capital markets. The first to be rated by Moodys was issued in 1997. Over 50% of Bond exposure is for USA hurricanes and earthquakes. Swiss Re issues CAT Bonds, every quarter, with cover for four different perils up to a limit of $6 billion. Four varieties are offered,, ach with a different mix of the four perils or affecting different parts of the world (ISQ, 2004). The four biggest hurricanes every to hit Florida, in 2004, were not enough to trigger any CAT Bonds, to the satisfaction of the investors who had bought them. In other words, the worst USA hurricane season so far was not as bad as the Bond issuers feared.

There are many challenges for the insurers regarding the potential Avian Flu pandemic. This particular threat is outside the normal insurance realm of risk. There is no significant conven-

tional capacity, either insurance or reinsurance for this. Limited covered is offered by some US insurers at unacceptably high premiums. Reinsurers have excluded all possibility of an Avian Flu claim. There are some possible alternatives sources of financing these risks, e.g. a blend of net capital with 'on demand' bonds, and Contingent Capital (Steingold, 2006). A possibility is industry-wide captives (Leidtke, 2006).

In Japan, some commercial firms have been using use CAT bonds for their earthquake risks since 1998 (Kawachimaru, 2006). But even CAT bond issuers face big changes in 2006: either more capital is essential, or they must reduce their peak-zone exposure (Isherwood, (2006).

Skills and Plans of Insurers, and Regulations

Even before 9/11/2001 and the windstorms of this decade, insures have regularly been warned of their need to improve their human resource skills to keep pace with globalisation and huge new risks (Lawrence, 2000). In the new circumstances of even worse uncertainty and disaster, the human resource ability of insurers is a key issue. Their skills in underwriting, risk management, statistical analysis, premium systems, claims processing and disaster management planning have to improve to match the deteriorating nature of risks (Kitseree, 2006).

In Japan, insurers who sell Business Interruption cover must have an adequate level of risk management ability and continuity to be able to deal with firms needing this type of insurance. Also, these insurers must have speedy claims settlement procedures for catastrophes (Kawachimaru, 2006).

Thai non-life insurers in Thailand are seen as having relatively poor risk assessment, with price-cutting highly prevalent. They score the worst in risk assessment according to the standards of the International Association of Insurance Supervisors (Arunmas, 2006). One insurer was closed down in 2005 by the government's Insurance Department, and another three companies were orders in 2006 to rectify their financial status.

The formula and techniques for Solvency margins have differed from country to country, and in some countries are very basic. In 2005 the AIS (International Association of Insurance Supervisors) produced 'A New Framework for Insurance Supervision', using sophisticated statistical methods which are risk-sensitive (Kawachimaru, 2006). It was announced in April 2006 that Thailand would be introducing the recommended rules by 2008. In Philippines, The Insurance Commission has implemented mandatory rates for natural perils, so as to rectify excessive competition and protect the long-term viability of insurers (Asia Insurance Review, Jul 2006, p35). These examples of regulatory changes in two countries are recognition that solvency, uninsurability and skills, are interconnected.

Radical Changes in Risk Management

Lloyds of London has issued a strong warning to insurers that they must face up to the growing threat of climate change or risk extinction (Lloyds, 2006). The report says that Insurers must invest in research, and a change in their underwriting behaviour is long overdue. Even two decades after the UN recognized that climate change was a catastrophic threat, the insurance industry had not taken catastrophe trends seriously enough. Recent natural disasters have shown that capital and pricing catastrophe models are inadequate. Also, underwriters must not simply base their decisions and premiums on historical data but factor in climate change predictions. Their valuation of assets (so important in solvency calculations) will be seriously affected. Partnership with government and business will be essential.

A new approach to risk management is needed. With traditional risks we know a lot of facts and the law of probability. In the newer risks we do not know the distribution of probability and scientific uncertainty is very high (Kessler, 2001). There are limits to the exactness of science because of the uncertain nature of life, where we experience transitory balance and equilibrium which then is overtaken by dynamic adjustment processes (Liedtke, 2006).

Regulations in USA, UK, Australia, Canada, develop standards and techniques and a generic approach to risk assessment. Reveals fast pace of RM change. A holistic approach to risk financing is emerging (Zech, 2001). Ruch (2006) advocates 'holistic' risk management of loss accumulation by insurers, by taking into account all lines of insurance business and their allied perils. This approach must include catastrophe models previously unthinkable.

An important risk calculation used in insurance is EML (Estimated Maximum Loss). This estimate ignores remote coincidences and catastrophes as possibilities but very unlikely. However, it was the ignoring of remote coincidences and catastrophes which led to underinsurance of the World Trade Towers. The PML (Possible Maximum Loss) evaluation model needs to be revised, as the worst case scenario needs more accurate calculation: the old model cannot cope with unexpected events.

Blong (1997) looks at the risk management of Catastrophe Exposures in Asia, especially identifying and analyzing earthquake risk. He has to go beyond the limitations of the CRESTA (Catastrophic Risk Evaluating and Standardising Target Accumulation manual). In China, experts are designing a fully probabilistic earthquake model covering the whole of China, in a partnership between The Institute of Engineering and RIMS (Risk management Solutions). It will include a high quality hazard inventory and vulnerability data, and could be ready in 2007 (Asia Insurance Review, July 2006, p27). Watson & McAllister (2005) have a fault-tree diagram for a bioterrorist event: "fault trees can provide quantitative data but can also be used as a qualitative tool" (p19).

Better risk assessment (mapping of risk) is needed. Technology can now deliver a new level of information for hazard analysis and risk management, thus making loss prevention best practices crucial to the insurance process Piesse, 2006). The need to map all types and all categories of risk is "leading us to an exhaustive nomenclature of risks " (Kessler, 2001: 7). Kessler calls all these essential changes to insurance risk management 'a scientific revolution', and for the first time in history there will be an exceptional combination of resources and knowledge to help us prepare, manage, anticipate and pool risks.

The two extremely important parts of Loss Control are Pre-loss and Post-loss. It is this Control stage which is of vital importance in saving lives and property, and which makes a substantial contribution to the economy and wellbeing of any country where it is practiced, its value extending far beyond those fortunate enough to be insured. "Identifying and simulating possible loss scenarios may not be able to prevent natural; catastrophes, but it can certainly mitigate their effects, save lives, and reduce property losses" (Kron, 2006: 20).

Pre- and Post- Loss Control are the responsibility of organizations (and individuals), but in practice most organizations seek advice from experts, especially within the insurance industry. All major insurance and reinsurance companies provide a Loss Control service, as do International Insurance Brokers and International Loss Adjusters.

International insurance Brokers have well established procedures for dealing with disasters, e.g. major air disasters where the two immediate concerns are the wellbeing of survivors and relatives of the deceased, and the need to establish cause (Travers, 2001; Gammon 2001). They also are also risk management advisers to their clients (for before and after an event), and an example of this is the advice they give about reducing the risk of the organizations inability to function after an Avian Flu pandemic, which includes: compliance with a government's Flu Plan and the need for contingency planning; measures to maintain core business activities, including online home access; identification of essential functions which are critical to business continuity (and also to identify services that can be reduced); and identification of interdependency between organizations (Steingold, 2006).

International Loss Adjusters, who are specialists in investigating claims and helping clients to recover from loss, have long had procedures for managing the insurance response to disasters. One Pan-Asia Loss Adjuster's disaster plan, before an event, includes naming task force members, designing systems to handle claim notifications, and a reinforcement team of colleagues from other offices in the region, plus a panel of specialist restoration contractors to help mitigate and contain damage (Neo, 2006). Such plans are under continuous review as the field of risk changes. One example is where an Asia-Pacific Loss Adjuster, by August 2006, have tested plans to enable it to continue in business during a pandemic so as to help its clients who have Business Interruption insurance. It has also established crisis communication plans with insurance brokers (McCarry, 2006).

Reinsurers are looking at technical aspects of windstorms and hurricanes, using more complex risk models. The same applies to climate cycles, global warming and their effects on risk evaluation (Munich Re (2006) and Swiss Re (2006). The record losses from Hurricane Katrina in 2005 made it very clear that adjustments are needed to adjust the models used to simulate hurricane risks, not only because hurricane frequency and severity distributions are changing but also because of the secondary hazards associated with tropical cyclones like storm surge and inland flooding. These secondary hazards have not yet been considered adequately in existing simulation models.

A Reinsurance company, Swiss Re, was the first corporate sponsor to provide financial support for a TV series on Global Warning in 2004, designed to raise awareness and hopefully to influence governments and people into ensuring that we make sustainable progress rather than ignore the threat because of short-term economics. The Central Java earthquake of May 2006 (which killed 5,600 people and left 10,000 homeless) is being researched by Munich Re. It happened on a previously unidentified fault zone. AIG (American International Group) is donating $1 million to relief efforts resulting from this earthquake. Insurance losses are fairly low, most of them for BI claims (Asia Insurance Review, July 2006, p30/31).

Monitor & Review is the final stage in risk management. This is essential because of rapid change. Yet it is often skimped. In USA local authorities must now, by law, help businesses plan for terrorist attacks and Avian Flu, under the Civil Contingencies Act, 2006, designed to ensure that disasters cause as little damage to the economy as possible and that businesses continue to trade (Tyler, 2006). Yet a survey found that only half the businesses actually had a plan, and an increasing number did not test the plan, suggesting complacency despite terrorist attacks after 2001.

Conclusion

During a debate in the British parliament on 12 October 2006, the Environment Minister said that the problem of climate change was worse than previously thought, and is the most imposing scientific and technical challenge that humanity has ever faced (uk.yahoo.news.com, 13 October 2006).

Global warming, caused by the thinning of the ozone layer; which itself is caused mainly by carbon emission from our industries and vehicles, and seemingly governments cannot or will not make real attempts to reduce these noxious emissions because it would harm their economies. It is all about markets, and growth, and GNP, yet "the idea that the world must be run by the stock market is as mad as any other fundamentalist delusion, Islamic, Christian, or Marxist" (Wright, 2005).

So, perhaps even our best attempts will not be enough, for fairly soon if global warming's consequences are as rapid as predicted, not only will insurers lack capacity for these awful risks but so will governments and rescue organizations. And mankind is limited in what it can know, especially about predicting the future, says Bernstein (1996: 329, 330), the author of a book which describes the development of our measurement of risk.

In 2002, months after the 9/11 attacks, Stewart (2002: 289) writes: "How our industry is viewed in times of great crisis is central to its overall public standing". The world faces its greatest crisis ever. How will insurers be viewed?

REFERENCES

Arunmas, Phusadee (2006), Master Plan Could Shake Up Industry, Bangkok Post, 25 April, pB2).

Bernstein, Peter L. (1996, Against the Gods: The Remarkable Story of Risk, John Wiley & Sons, New York.

Blong, Russell (1997), Managing Catastrophic Exposures in Asia, Singapore International & Actuarial Journal, Vol.1, Singapore Insurance Institute and Nayang Business School, Singapore.

Dorfman, Mark S. (1998), Risk Management & Insurance, Prentice, New Jersey.

Hahn, Franz-Joseph (2006), China: Land of Potential, Land of Challenge, Asia Insurance Review, EAIC Special Edition, August.

Hannen, Michelle (2006), Gambling on Risk, The Journal, Chartered Insurance Institute, London, April.

Isherwood, Jonathan (2006), GE Insurance Solutions (reported in Asia Insurance Review, July 2006, p40).

ISQ (Insurance Securitization Quarterly) (2004), Vol.1, Issue 3, Reactions Publisher, London.

Jacinto, Herminia (2006), Developing the Market Through Enhancing Public Awareness of the Need for 23rd EAIC Congress, Brunei, July/August.

Kawachimaru, Kazuhiro (2006), The Challenge of Protecting Solvency While Providing Much-Needed Protection Against Earthquakes, Floods, Typhoons and Tsunamis, 23rd East Asian Insurance Congress, Brunei, July/August.

Kessler, Denis (2001), Anticipating and Managing Risks in the 21st Century, The Geneva Papers on Risk & Insurance Vol 26 No.1, January.

Kitseree, Suwanna (2006), The Role of Insurers in Disaster Management, paper resented at 17th Inter-University Conference of ASAIHL, Jakarta, December.

Kron, Wolfgang (2006), Causes of Catastrophes - Scenarios in the United States, Munich Re Knowledge Series, Hurricanes.

Lawrence, Brian (1997), A Macro-Perspective on Health Insurance in Singapore, in Affordable Health Care (eds: Tan Teck Meng and Chew Soon Beng), Prentice Hall, Singapore.

Lawrence, Brian (2000), A Skills Warning, Asia Insurance Review, EAIC 2000 edition, Singapore.

Lawrence, Brian (2005), Insurance Products for the Poor in Thailand, Journal of Risk Management & Insurance, Vol.10, Assumption University of Thailand, Bangkok.

Liedtke, Patrick M. (2002), Insurance at the Limit - Vulnerability, Insurability, and Responsibility, The Geneva Association General Information No.172, July.

Lloyds (2006), Climate Change: Adapt or Bust, Lloyds of London.

Lo, Kaily (2006), Increasing Public Awareness of the Need for Disaster Prevention, Risk Management and Contingency Planning, 23rd EAIC Congress, July/August, Brunei.

McCarry, , Ian (2006), Panel Discussion on Avian Flu, 23rd EAIC Congress, July/August, Brunei.

Miedema, Douwe (2006), 'Insurers Face Big Capital Crunch', Bangkok Post, 13 September, pB3.

Munich Re and American Re (2006), Hurricanes - More Intense, More Frequent, More Expensive. Munich Reinsurance Group, Munich.

Neo, Nehemiah (2006), Ensuring Efficient & Effective Claims Settlement in Times of Disaster. 23rd EAIC Congress, July/August, Brunei.

Nichols, Philip (2004), Changing Perspectives of Risk, Journal of Risk Management & Insurance Vol 9, Assumption University Bangkok.

Piesse, David (2006), The Threat of Avian Flu: Implications for the Insurance Industry and Some Suggested Solutions, Asia Insurance Review, EAIC Special Issue, August.

Rauch, Ernst (2006), Consequences for the Insurance Industry: New Loss Distributions, in Munich Re Knowledge Series - Hurricanes.

Swiss Re (2006), Natural Catastrophes and Man-Made Disasters 2005, Sigma Report No.2/2006, Swiss Reinsurance Company, Zurich.

Steingold, Malcolm (2006), Panel Discussion on Avian Flu, 23rd EAIC Congress, July/August, Brunei.

Stewart, Gordon (2002), The Public Role of Insurers in Man-Made Catastrophes, The Geneva Papers on Risk & Insurance, Vol 27, No,.2, April.

Travers, Paul (2001), The Role of the Aviation Claims Broker in a Major Accident, DYP Practical viation Seminar 19-21 March, London.

Trumpp, Ulrich (2006), The Challenge Facing Insurance Markets - Suggestions for a Better Tomorrow, Asia Insurance Review, EAIC Special Issue, August.

Tyler, Richard (2006) 'Businesses Get Disaster Planning Help', in Daily Telegraph London, 16 May, pB8).

Watson, Alan; McAllister, Fiona (2003), Bioterrorism and Risk Assessment, Journal of Risk Management & Insurance, Assumption University, Bangkok

Wright, Ronald (2005), A Short History of Progress, Canongate.

Zech, Jurgen (2001), Rethinking Risk Management: The Compilation of Financial and Industrial Risk, The Geneva Papers on Risk and Insurance Vol26 No.1, January.