CLIMATE CHANGE

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Managing risks and controlling losses is central to the insurance business. While the primary focus has been on *financially* managing risks, *physical* risk management could also play a large role in helping to preserve the insurability of natural hazards. BY EVAN MILLS

THE INSURANCE SECTOR serves as a national—and increasingly global—integrator of catastrophe costs across all sectors of the economy. It provides a critical function within the global economy by helping create the certainty businesses need in order to invest and grow.

At various points in history—the Great Dust Bowl of the 1930s, urban riots of the 1960s, and terrorism today—watershed events or trends ushered in structural changes within the insurance industry. Global warming is the next watershed of this type. The growing incidence of extreme weather events poses an enormous challenge to the insurance industry.

It's sobering to note that the average annual insured losses from weather-related catastrophes exceed that of the Sept. 11 attacks, yet they receive only a fraction of the attention. If we're concerned about terrorism, shouldn't we be equally concerned about global warming and climate change?

An international consortium of insurers recently released a new study stating that the global economic costs of extreme weather events are doubling every 12 years and that a probable maximum loss (PML) of $1 trillion can now be anticipated. This PML is up a remarkable sixfold from that issued by the same group just four years ago.

This is seen as the combined effect of the increasing vulnerability of human infrastructure (the dominant factor) and climate change. Particularly worrisome are the trends in human activity and our changing climate that compound one another.

There are seven broad concerns about the implications of climate change for insurers and their customers:

- The rising level and declining predictability of extreme weather events, coupled with the growing incidence of linked losses previously believed to be uncorrelated, presents an obvious conundrum for actuaries.
- While many who are sanguine about insurers' ability to adapt to climate change assume that change will be gradual, abrupt climate change is a serious possibility. The European heat wave of 2003, for example, resulted in temperatures nearly six *standard deviations* from the long-term norm.
- The lack of fundamental baseline data on insured weather-related losses and exposures is sometimes astounding. There are also weaknesses within existing catastrophe models, and insurers are often ill-equipped to apply those models properly.
- The largely unanticipated correlation between insurers' core business and their investments creates the potential for a "perfect storm" of demands for payouts and loss of consumer surplus through the impact of mega-catastrophes on financial markets.
- Non-U.S. insurers tend to be more advanced in their analysis of and responses to climate change, which may have adverse implications for the global market share enjoyed by U.S. companies. Allstate has said that it's "getting smaller everywhere around the country" in response to the growing rate of natural disasters.
- A particularly difficult business environment will appear in the emerging markets of Asia, Africa, and Latin America where U.S.-domiciled insurers are already expanding aggressively but often without appreciation for rising weather-related exposures and lack of loss prevention.
- The threat to insurability itself is manifested by the already apparent crisis in availability and affordability in the United States. A shift to publicly funded insurers of last resort will be appropriate in some cases but should be a measure of *very* last resort. It's highly preferable to find market-based solutions rather than to allow markets to fail and plug the proverbial dike with inferior government solutions.

Business Interruption and Liability Risks

While the most widely discussed insurance-related consequences of climate change concern property damages from extreme weather events, there is increasing awareness of the more subtle but equally material dimension of liability. Even for those who believe that the *physical* effects of climate change may not cause observable insurance losses for some time, liability-related claims *are* already being made. The relevant broad categories of insured liability include:

- Commercial general liability, which would encompass negligence, personal injury, and third-party business interruption via disruptions in supply chains, transportation, and communications.

- Product liability claims associated with materials or products that contribute to the greenhouse effect.
- Environmental liability claims for emitters of greenhouse gases based on various impacts of climate change itself or, indirectly, for consequences associated with toxic releases, mold, and other costs of the physical effects of climate change.
- Professional liability claims, e.g., corporate directors' and officers' liability for those involved as emitters or arising from failure to safeguard shareholder value from the consequences of climate change.
- Political risk liability triggered by new government policies (e.g., carbon levies).
- Personal and commercial vehicle liability from increased roadway accidents related to adverse weather.

Theories of legal liability that could be associated with the aforementioned types of insurance liability will include:

- Product liability claims.
- Claims based on negligent conduct.
- Nuisance claims based on harmful impacts of greenhouse gases.
- Claims based on the Sarbanes-Oxley Act of 2002 or other statutory duties of corporate officers or directors.
- Claims of breach of fiduciary duty by corporate officers or directors.
- Fraud- or misrepresentation-related claims triggered by sources of misinformation on climate change.
- Tort, breach of contract, and related claims resulting from the effects of business interruptions on third parties.
- Claims based on environmental liability statutes (e.g., CERCLA) for contamination resulting from climate change-related impacts.
- Other legal theories (e.g., public international law, violations of the Endangered Species Act, natural resources damage, and breach of human rights).

Addressing climate change with litigation is both inefficient and expensive. Whether or not climate change lawsuits are successful and GHG-emitting companies are held liable for their role in climate change, significant litigation costs will be incurred by defendants. Controlling such litigation costs is of paramount importance.

Responses to climate change, whether adaptation or mitigation, will also entail liabilities for insurers and their customers. These include considerations for existing and new energy technologies, both on the supply side (nuclear power) and the demand side (energy efficiency) of the equation, as well as liabilities associated with market-based carbon-reduction strategies such as trading or offset schemes.

Health and the Health Care Infrastructure

The life/health segment represents well over half of U.S. insurance premium volume. Climate influences many of the most important diseases. The health of non-human systems (forests, crop systems, wildlife, livestock, and marine life), if compromised, can cause economic and insured losses for humans (drought and forest beetle infestations leading to timber loss and wildfire). Such losses link directly to industries and the "health of their assets" (timber, agriculture, poultry, and fisheries; to investors and insurers), as well as to public health via deterioration of life support systems.

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There are at least nine major categories of anticipated health impacts with implications for insurance. These include:

- Infectious diseases (such as vectors ranging from mosquitoes carrying malaria or West Nile virus, to ticks carrying Lyme disease, to rodents carrying hantavirus);
- Heat stress. (Few in the United States are aware that upwards of 35,000 people in excess of the norm died in the European heat wave of 2003);
- Respiratory and coronary disease;
- Waterborne diseases exacerbated by temperature and water quality or by overwhelmed water treatment infrastructure after floods;
- Physical injury from extreme events and natural disasters such as flooding, as well as the tendency for disease outbreaks to cluster around extreme weather events ("Katrina Cough", etc).
- Effects of toxic materials released and distributed by extreme weather events;
- Food poisoning (a strong correlation between salmonella outbreaks and temperature);
- Post-event mental health problems;
- Health consequences of malnutrition and water shortages in developing countries.

Extreme weather events also wreak havoc on health care *infrastructure.* Today, nearly two years after Hurricane Katrina, there are half as many psychiatric beds available in New Orleans

hospitals while the incidence of serious mental health problems has doubled. Only two of 11 New Orleans hospitals are fully functioning.

Many secondary and nearer-term health *benefits* arise from reductions in greenhouse gas emissions. Air pollution and carcinogens are reduced when energy demand is trimmed (especially particulates, ozone, nitrogen oxides, heavy metals, and sulfur dioxide), and other categories of benefits appear such as reduced roadway injuries and deaths where public transportation is employed.

Unfortunately, the potential for rising losses caused by climate change is compounded by other dimensions of human behavior, such as settlement in high-risk areas, urbanization, and longer life expectancy. This only serves to raise the vulnerability of populations to climate change.

Insurers' Knowledge of Climate Change

With some important exceptions, U.S.-based insurers' knowledge of these impacts is, on average, quite thin. While the American Insurance Association recently stated that "...the insurance industry does not have the expertise to evaluate conflicting interpretations of scientific evidence or positions on climate change," a number of individual companies and their CAT modelers have shown considerable initiative. The existing focus is largely limited to the property insurance lines, with little if any attention to the implications for the liability, health, and life insurance lines.

Like the popular media, the insurance industry seems to be myopically focused on the large headline-catching events, such as hurricanes. The North Atlantic basin typically hosts only between 5 percent and 10 percent of the global cyclonic storms and depressions. 2006 activity in the Atlantic was indeed much lower than 2005, but the numbers were up in three of the five *other* ocean basins. But whether the trend is up or down, climate is the *long-term* average of weather, and climate change is associated with more *variability* in weather-related events. Thus, hurricane losses shouldn't be expected to show a smooth trend from year to year. Quiet years should not invite complacency.

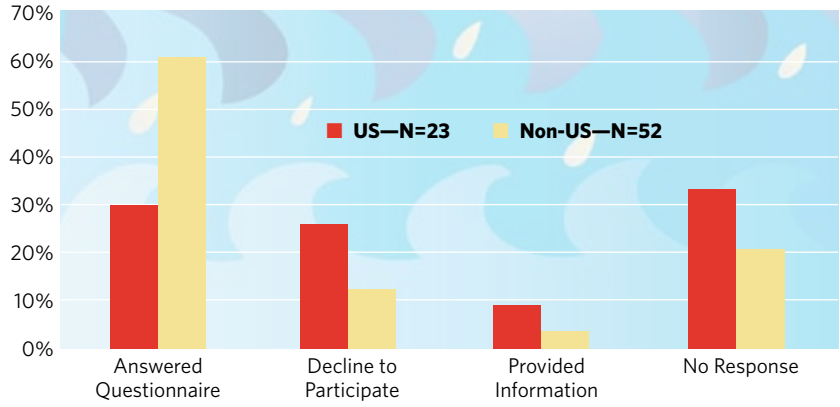
A measure of the seemingly limited concern exhibited by primary insurance companies in the United States is their low response rate to the annual Carbon Disclosure Project (CDP) surveys, especially as compared to other U.S. industries and to insurers in other countries (see figure). The CDP provides a secretariat for the world's largest institutional investor collaboration ($31 trillion under management) on the business implications of climate change. CDP represents an efficient process whereby many institutional investors collectively sign a single global request for disclosure of information on greenhouse gas emissions. CDP has historically sent this request to the FT 500 largest companies in the world, recently expanded to 2,100 companies.

Practical Best Practices

More than 100 leading insurers and trade allies have implemented innovative products and services designed to mitigate climate risks, which can be used to derive a series of best practices. An insurer that integrates these best practices into its business will implement the following 10-point strategy:

- Make concerted efforts to restore and maintain the insurability of extreme weather events. This may require partnerships with governments, e.g., in the cases of improved land-use planning and enforced building codes.
- Improve the modeling and other methods of analyzing risks associated with climate change.
- Utilize terms and conditions to foster the right decisions by customers. This could range from rewarding risk-minimizing behavior to excluding climate change liabilities for those who make imprudent decisions either as emitters of greenhouse gases or managers of risks associated with climate change.
- Develop new products and services to facilitate maximum customer utilization of climate-friendly technologies and practices, especially in cases where they yield loss-prevention co-benefits.
- Invest in strategic R&D and rebalance investment portfolios to (a) recognize climate-related risks to investments and (b) capitalize on opportunities for emerging industries that will participate in climate change solutions.
- Actively participate in carbon markets, both as investors and as risk managers.

Insurer Response Rates to Carbon Disclosure Project (CDP) Survey: 2006



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- Lead by example in minimizing the insurer's own "carbon footprint." This includes minimizing the climate impacts of real estate owned by the insurer and the carbon footprint of business operations, as well as analyzing and disclosing exposures to climate change.
- Take an active role in the education of customers about climate-related risks and opportunities for minimizing them.
- Actively engage in public policy discussions about appropriate responses to climate change.
- Tighten terms and conditions, withdraw from markets, or increase insurance prices only when the aforementioned best practices have first been exercised to their fullest cost-effective potential.

Recommendations for the NAIC

There are 12 potential ways in which the NAIC can make a constructive contribution toward analysis and capacity building, promoting disaster resilience and loss prevention, maintaining insurance availability and affordability, and safeguarding customer surplus.

Stay current on the science. Although climate change is one of the more dynamic and rapidly developing areas of science, many commentators refer to decade-old information as "state of the art," typically resulting in overstatement of the uncertainties. Some parties exaggerate or ignore uncertainty through selective reporting—although their ranks are thinning.

The first of three Fourth Assessment of the Intergovernmental Panel on Climate Change (IPCC) reports was released in 2007 by the United Nations. The IPCC reports uniquely synthesize the existing scientific literature on climate change and provide summaries for policymakers that are accessible to non-specialist audiences. Several of the chapters in this assessment discuss the relevancy of climate change for insurance.

Require that insurers collect and analyze more comprehensive data on weather-related losses and their insurance implications. The full cost of weather-related insurance losses is *not known.* And the existing floor of $25 million of insured losses per event understates, skews, and diminishes the value of

the Property Claim Services data upon which insurers and their regulators heavily rely.

Thanks to this arbitrary cutoff, for example, no winter storms were included in the PCS statistics for the 46-year period from 1949 to 1974, and few were included thereafter. Yet these events collectively yield losses in an average year on a par with those of a large hurricane. Relaxing the $25 million limit within PCS or creating a new data-gathering activity focusing on smaller-scale events (which have large cumulative losses) would be of considerable value.

My own research has been confounded by the lack of readily available data on U.S. insurers' premiums, exposures, and losses for the business they do *outside* the United States. This information is much needed, as climate-change risks are located in the emerging markets where some U.S. insurers are looking for growth.

I know of no comprehensive database on insurance policy cancellations or other indicators of changes in insurance availability. Anti-trust laws could be an unintended barrier to establishing such a database, and the NAIC should take a leadership role in implementing a system.

Raise the standards of practice for catastrophe modeling, and create a non-proprietary modeling and data-collection entity. In order to assess exposures of insurers and their customers, CAT models should integrate the processes of climate change. Some modeling firms have begun to do so, but there is much more work to do. The models and their embedded assumptions should be subject to peer review—by an appropriately composed team—and validation, and should be transparent to regulators. Regulators should not be expected to do this in-house.

Putting some modeling and data in the public domain could reduce redundant expenditures by individual insurers and make life easier for regulators who now have to vet models individually. There are enormous opportunities to build better bridges between the extensive scientific community analyzing climate risks and solutions and those working in insurance and the actuarial sciences.

Add climate-change interrogatories to the statutory annual statement in response to the need for public disclosure of insurer risk analysis of climate change. NAIC should develop template language for inviting insurers to articulate their

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efforts to understand and manage climate-change risk as part of the statutory annual statement.

Promote the development of climate-friendly insurance products and premium incentives through model laws and/or regulations. NAIC should adopt model laws for state legislators and/or insurance regulators, whose job it is to ultimately adopt them. Insurers should provide differentiated premiums, financial incentives, or financing to encourage risk-reducing behavior. An example would be to call for separate rating of green buildings, keep track of loss experience, and ultimately use the results (if lower losses are indicated) to propose differentiated premiums. State insurance regulators are operating in a new era with respect to climate change, and it's necessary for them to make a special effort to encourage insurers and insurance consumers to make sound recommendations that can quickly be considered by regulators.

Require actuarial pricing of risks based on improved understanding of climate-related risks in combination with insurer accountability and attention to availability and affordability issues. I live on the edge of a wildland-urban interface in California yet pay the same fire premiums as much less at-risk houses in my area. More actuarial (or risk-based) pricing certainly raises issues of affordability but also can be geared to encourage

better behavior (managing fuel loads around structures, for example). NAIC should ensure that underwriting decisions are based on an intention of long-term market participation. Contexts deemed uninsurable should be treated as such, so that insurance does not inadvertently encourage maladaptation to climate change and ultimately leave customers exposed and uninsured.

Take the lead on a coordinated national effort to improve disaster resilience through the adoption, enforcement, and implementation of improved building codes. Improved building codes are one of the key strategies, and their benefits have been well documented. Post-Katrina analyses revealed that per capita household catastrophe losses were three times lower in areas where building codes and comprehensive land-use planning were in use and eightfold lower for a collection of properties covered by commercial-lines insurance. To be effective, building codes must be enforced.

Promote "rebuilding right" following losses. "Rebuilding right" in the aftermath of Hurricane Katrina is an immediate opportunity that could involve everything from wetlands restoration to safer buildings. The flip side of this coin is that following losses, properties should be insured again only if they meet appropriate standards. Insurers can facilitate this with financial incentives/signals and perhaps direct customer financing of upgrades.

Promote partnerships with policyholders for loss mitigation. Examples include insurer-financed loans for building retrofits, paid for with loss mitigation discounts. There is also a huge need for better consumer education and information. The insurer-funded Institute for Business and Home Safety is engaged in such activity for some property-casualty lines but at a very modest level given the need. Its "Fortified… for safer living" guidelines provide one framework for identifying eligible measures.

In 2004, the Insurance Australia Group (IAG) developed a partnership with local government planners in New Zealand to determine the most appropriate flood planning levels for the future. IAG provided modeling results indicating changes in extreme rainfall, which the local government, used to determine the likely changes to future flood levels. This was then incorporated into their flood mitigation program, e.g., planning for higher levee embankments.

Safeguard surplus based on understanding of climate change, and encourage prudent investments in technologies and industries that will be part of the solution. Revise risk-based capital requirements to provide credits for climate-friendly investments, including carbon trading. Effectively, a dollar invested in climate-friendly endeavors would be weighted higher, which would mean that insurers investing in these new directions would enjoy a higher ROE for a given level of revenues because the overall required level of capital would be lower.

Encourage or require insurers to minimize their own carbon footprint. Leadership by example is important both symbolically and practically. Some insurers already participate in the national ENERGY STAR Program and other initiatives to trim energy use and GHG emissions in their own operations.

Communicate industry needs and priorities to federal and local governments with lead responsibility for implementation. These range from updating antiquated flood-plain maps, to performing climate change research, to implementing appropriate public-health measures, to reducing the emissions of greenhouse gases.

The American Insurance Association offered six such recommendations to the OECD for mitigating catastrophe risk. These included early-warning systems, better land-use planning, improved building codes and catastrophe-resistant reconstruction, improved coordination and planning of national and international relief efforts, assistance in catastrophe contingency planning, and support for pre- and post-event mitigation and response.

In addition, the NAIC, through its international activities, should seek audiences with insurance regulators in other countries to learn how they have responded to the climate change issue. Managing risks and controlling losses is central to the insurance business. While the primary focus in recent years has been on *financially* managing risks, *physical* risk management is rightfully receiving renewed attention from insurers and regulators, and could play a large role in helping to preserve the insurability of natural hazards. ●

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