AUGUST
2005

THE NEWSMONTHLY OF THE AMERICAN ACADEMY OF ACTUARIES

Technology Alters Loss Forecasting

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IN 1993, THE YEAR after Hurricane Andrew struck south Florida, the state's property insurance market was in serious disarray: 11 companies insolvent and many others with crippling financial losses, hundreds of thousands of non-renewed policies, and a rate deficiency that would eventually require doubling the average rate despite the formation of a large public reinsurer with billions of dollars of inexpensive capacity. In 2005, despite Andrew-sized losses from the combination of four hurricanes in the previous year and forecasts of an active season, the Florida market has experienced significantly less disruption than in the aftermath of Hurricane Andrew.

The insurance system's improved response in 2005 is the result of a decade of hard work by many stakeholders, including insurers, regulators, and the Florida legislature. A critical, and often underappreciated, factor is the quantum leap in the sophistication and accuracy of loss forecasting capabilities through the development of catastrophe models

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and their acceptance by actuaries, insurers, investors, and policy-makers.

An understanding of the numbers—such as average annual expected losses, probable maximum loss, or the expected effect of stricter building codes—is a prerequisite for a well-functioning insurance system. Traditionally, actuaries used the "excess wind procedure" to estimate the provision required in rates to cover catastrophe losses. This procedure used 30 years of historical data to estimate the relationship between catastrophic losses and normal losses, and then used that relationship to forecast the expected level of catastrophic losses in the future. Andrew exposed serious problems with this method, leading actuaries to turn to catastrophe models for their forecasts.

There have been some bumps along the way as more sophisticated modeling has taken hold. The abrupt change in tools used to develop loss forecasts and a subsequent communications breakdown among insurers, regulators, the media, and the public on why the change was needed were major contributors to the market disruption in 1993. In 2005, catastrophe models have been a source of stability to the market. Losses from 2004 were within the range of reasonable estimates (albeit at the high end), and insurers who used forecasting tools were far better prepared to cope with the aftermath.

Top 10 Hurricanes and Estimated Insured Loss

(adjusted to 2004 dollars)

YEAR	EVENT	INSURED LOSS
1992	Andrew	$20.8 billion
2004	Charley	7.5 billion
2004	Ivan	7.1 billion
1989	Hugo	6.4 billion
2004	Frances	4.6 billion
2004	Jeanne	3.7 billion
1998	Georges	3.4 billion
1965	Betsy	3.1 billion
1995	Opal	2.6 billion
1999	Floyd	2.2 billion

This information is compiled from the ISO Property Claim Services database on property losses for man-made and natural disasters.

The use of new catastrophe models also significantly changed many actuarial tasks, notably in ratemaking. Because most regulatory paradigms were not designed to assess rates developed by proprietary computer programs using input data that could not be reconciled to financial statements, regulators had to adjust. At the same time, the actuarial profession moved to adapt several Actuarial Standards of Practice (ASOP) that affect the use of models in actuarial practice, notably:

- ASOP No. 23, *Data Quality*—Catastrophe models rely on non-financial statement exposure data. Since this data cannot be reconciled to an audited financial statement, great care must be exercised in building the data sets that feed the models.
- ASOP No. 30, *Treatment of Profit and Contingency Provisions and the Cost of Capital in Property/Casualty Insurance Ratemaking*—Catastrophe models allow actuaries to build loss distributions that can be used to estimate the expected variation in losses, which affects the amount of capital required to support a book of business.
- ASOP No. 38, *Using Models Outside the Actuary's Area of Expertise (Property and Casualty)*—Catastrophe models require actuaries to rely on complex computer programs reflecting many scientific disciplines, including geology, meteorology, engineering, and computer science.
- ASOP No. 39, *Treatment of Catastrophe Losses in Property/Casualty Ratemaking*—Catastrophe models have necessitated major changes in ratemaking practices, which prompted the Actuarial Standards Board (ASB) to adopt this standard in 2000.

As catastrophe modeling changes, the actuarial profession is keeping pace—embracing new technology to improve the quality of our work product and updating professional standards to provide guidance along the way.

Rade Musulin is chairperson of the Academy's Communications Review Committee, a member of the *Update*'s editorial board, and vice president—operations, public affairs, & reinsurance for the Florida Farm Bureau Insurance Cos. in Gainesville, Fla.

ACADEMY SEMINAR FOR APPOINTED ACTUARIES

Effective Loss Reserve Opinions

The Academy is offering a new seminar Oct. 19 in Chicago for actuaries who expect to prepare and/or sign NAIC statements of actuarial opinion on property/casualty loss reserves in 2005.

The one-day seminar, "Effective Loss Reserve Opinions: Tools for the Appointed Actuary," will focus on regulatory and professionalism concepts, rather than the more fundamental techniques studied by actuarial students. Seminar leaders will discuss governing regulations, applicable standards, new requirements, and what users of the actuarial opinions want. The seminar will also offer pointers on:

- Accepting an opinion assignment
- Handling documentation, point estimates, ranges, and management's best estimate
- Disclosing risk of material adverse deviation
- Dealing with difficult situations.

Led by top professionals, including instructors who are company, consulting, and regulatory actuaries, the seminar will feature small class size and a participatory structure to ensure that participants come away with concrete, marketable skills.

The seminar, to be held at the O'Hare Hilton in Chicago, is being offered by the Academy's Committee on Property/Liability Financial Reporting and the Academy's Professionalism Council. For more details, contact Greg Vass (vass@actuary.org), the Academy's senior policy analyst for casualty issues.