

# Risk Retention in a Hardening Insurance Market

**T**HE CHIEF RISK OFFICER, RISK MANAGEMENT DEPARTMENT, and captive managers of most organizations are currently facing the toughest insurance purchasing environment in the past two decades. Examples of these challenges include:

- Double-digit increases for lines like property, workers compensation and medical malpractice;
- Triple-digit increases for aircraft liability and higher layer excess policies;
- Lack of coverage availability (a problem exacerbated by the 9-11 tragedy);
- Self-insured retention and deductible increases (a reversal of the '90s trend, in order to offset the large premium increases seen for many lines of business);

may seem exorbitant from an organization's perspective, a 10 percent to 25 percent increase has only

a minor impact on the insurer/reinsurer's premium when cumulative premiums have dropped 50 percent to 90 percent during the soft market of the 1990s. Case in point: If the stock market drops 50 percent, then rises 50 percent, does the investor break even?

In light of these pressures and the unfavorable reaction of senior management to rising insurance costs, a number of organizations have already begun investigating the impact of higher deductibles and in-

## Inflation Impact by Layer—Average of 10,000 Simulation Results

	Aggregate Losses (000s)						
	Ground Up	First 100K	150K xs 100K	250K xs 250K	250K xs 500K	250K xs 750K	250K xs 1000K
Base Assumption	10,000	5,263	2,278	1,259	489	244	225
3% Ground-up inflation	10,300	5,340	2,359	1,320	517	260	241
6% Ground-up inflation	10,600	5,416	2,440	1,381	546	276	258
Percent Increase Over Base							
3% Ground-up inflation	3.0%	1.5%	3.6%	4.8%	5.7%	6.5%	7.1%
6% Ground-up inflation	6.0%	2.9%	7.1%	9.7%	11.6%	13.1%	14.4%

**Modeling Assumptions:** 1. Poisson distribution, 100 expected claims. 2. Lognormal Parameters  $E(LN(X)) = 10.708$   $SD(LN(X)) = 1.269$ . Equivalent to an average claim size = \$100,000, CV = 2.00

- Increased retention of risk in the organization's captive;
- Increasing insurance policy term and condition restrictions (e.g., exclusions for terrorism coverage and mold); and
- Increasing demands on organizations for more detailed underwriting information in their broker submissions.

The insurance industry began to harden in late 2000. Deteriorating insurance industry financial results, the significant impact of the Sept. 11 tragedy (estimated between \$30 billion and \$50 billion of insured losses), and the reduction in underwriting capacity (e.g., St. Paul exiting medical malpractice, Fortress Re aviation underwriting pool collapse, and rating downgrades) have all helped to accelerate the process.

The hardening market, combined with a flight to quality, has helped to create a "back to reality" pricing check. Although the current premium quotations

increased risk retention in their captives. We have also seen a significant rise in the number of organizations interested in performing captive feasibility studies, adding new lines of business in their captives, and investigating the reactivation of dormant captives.

Organizations have also been turning to segregated portfolio captives (also known as protected cell captives) in domiciles such as the Caymans, Bermuda, and Vermont. Segregated portfolio captives allow an insurance company to segregate the assets and liabilities of different participating shareholders, protecting them from the liabilities of other cells within the insurance company.

Regardless of the type of insurance purchasing hurdle an organization faces, a number of critical questions need to be answered before the decision to retain additional insurance risk is made. Some of these questions include:

- What is the cost/benefit of increasing the organization's retention of insurance risk? Does the insurance premium saved outweigh the additional losses retained?

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## Impact of Inflation on Excess Layers

Claim	2001 ACTUAL			2002 PROJECTED @6%		
	Large Loss	500K xs 1,000K Losses	500K xs 1,500K Counts	Large Loss	500K xs 1,000K Losses	500K xs 1,000K Counts
1	750,000	—	—	795,000	—	—
2	975,000	—	—	1,033,500	33,500	1
3	1,466,500	466,500	1	1,554,490	500,000	1
Total	3,191,500	466,500	1	3,382,990	533,500	2
<b>INFLATION:</b>				6.0%	14.4%	

■ = 100% increase in claims penetrating layer

■ = Excess layer severity inflation rate is 139% higher than ground-up rate

■ What confidence level would the risk manager assign to the annual insurance cost estimate that feeds the organization's financial plan? For example, a risk manager might be much more comfortable feeding senior management a guaranteed cost estimate for property insurance on the San Andreas Fault than a self-insurance estimate.

■ Does the organization's current risk retention strategy give it the best "bang for the buck"? (A high-claim-frequency, low-loss-severity organization might be better off purchasing an aggregate excess of

loss contract rather than focusing on per-occurrence loss retentions.)

■ Can senior management and shareholders live with increased earnings volatility driven by the volatility of insurance costs?

The actuary is well equipped to answer these questions. Actuaries have significant experience in performing cost/benefit analyses, conducting captive feasibility studies, and assisting organizations in the pricing of difficult-to-quantify risks. Additionally, developments in the field of reinsurance pricing and the use of Dy-

namic Financial Analysis (DFA) have also added to the total enterprise risk management solutions actuaries are delivering to organizations.

In order to design a proper insurance program, the most fertile area of study for the organization is a clear understanding of the nature of their loss frequency and severity distributions. A focus on the shape, likelihood, and correlation between coverages helps to highlight key risk exposures. For example, identifying low-probability catastrophic events and attritional losses can guide the organization in its selection of an optimal risk retention strategy. This risk retention strategy is heavily affected by the coverage options available to the organization, anticipated inflation levels, and senior management comfort levels concerning the volatility of insurance costs.

### Coverage Options

The analysis should include a review of the major insurance options available to the organization. By simulating aggregate loss exposure using the frequency and severity components, various combinations of attachment points, deductibles, and layers can be modeled for the organization. Simulation results can illustrate when an organization should consider aggregate insurance protection when faced with attritional losses or the use of indexed retentions when the impact of inflation is significant on higher layers.

### Inflation

The impact of claim cost inflation on an organization's newly retained layers can be considered as well. Inflation varies significantly, depending on the volatility of the organization's claims (often measured by the coefficient of variation or CV), anticipated level of claim inflation, and the attachment points of the layers retained by the organization. The following table illustrates the difference between actual ground-up claim inflation and the inflation experienced in aggregate by layer:

As one can see from the above table, an organization that decides to retain the \$500K xs \$1,000K layer in its captive by

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assuming historical losses trended by 6 percent may be in for quite a surprise when actual losses appear to be growing in excess of 14 percent each year.

As John T. Lang pointed out in his 1969 article, "The Interpretation of Liability Increased Limits Statistics," inflation in the higher layers is driven by the severity of losses and the frequency of losses penetrating the layer. The following three-claim example helps to illustrate the impact of inflation on excess layers:

#### **Confidence Level**

The communication of the simulation results should include a clear and concise description of the confidence level being presented to senior management. For example, captive managers sometimes select the average result of the actuary's simulation analysis when booking reserves. Unfortunately, many interpret "average" with the 50/50 probability associated with tossing a coin (e.g., normal distribution).

When the shape of the distribution is skewed, the average doesn't represent the 50 percent level of confidence. For log-normal distributions that are skewed to the right, the average implies a confidence level above the 50th percentile. For log-normal distributions where the client has purchased aggregate protection, the average likely implies a confidence level below the 50th percentile.

In addition to these distribution-based considerations, other more common considerations include the review of exposures and lapses in coverage.

#### **Exposure Analysis**

An organization should discuss and review transactions that may have altered the underlying types of claims that will be faced going forward. Discussions with the risk managers would include transactions such as the sale of a division and the impact of excluding that division's claims, union negotiations, or potential layoffs. Additional factors based on the business environment include growth in specific areas of the company that may increase or decrease future loss frequency or severity, acquisitions that may alter

the composition of the book of business, and external influences such as litigation and social factors.

#### **Lapse Review**

An organization should also include a review of any potential lapses in coverage due to a change in the organization's insurance purchasing strategy. In situations where companies have historically purchased claims-made coverage, a move to self-insurance would require the purchase of tail coverage from the prior insurer, a loss portfolio transfer of the tail liabilities, or the purchase of a retroactive date through the organization's captive.

For organizations that have made acquisitions throughout the year, it's important to review the insurance policies of the acquired entity to verify that insurance coverage hasn't been cancelled. (Some D&O and E&O policies automatically cancel when an organization is acquired.)

In the end, the key to evaluating and

understanding the nature of the organization's projected aggregate losses and risk retention strategy is founded in a deep understanding of the loss distributions and the important factors affecting key modeling assumptions, such as inflation, exposure, and correlation. The ability to assess the organization's optimal level of risk retention/risk transfer by varying deductibles, attachment points, aggregates, and layers is critical. Simulation by itself may not yield the exact answer, but expectations and reasonable ranges will help the organization get a better handle on their expected levels of risk.

From a more sophisticated perspective, simulation analysis is often helpful in pointing out catastrophic scenarios that may not be intuitive in a deterministic analysis. The ability to point out and address these catastrophic scenarios will likely increase risk awareness and support from senior management in the organization.

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