Analysis of the Risk-Funding Decision

By Amy v. Puelz, Ph.D.

All firms are faced with making the decision about how to design a funding plan for property-liability risks. On a regular basis, managers should reevaluate their risk management plan and determine whether current self-insurance funding and/or commercial coverage is appropriate, given the firm’s financial position, its existing risk exposure and the prevailing economic climate. Managers should have a clear understanding of how much risk is retained by the firm in the form of deductibles, coverage caps and self-insurance plans, and should be able to justify the reasonableness of risk-retention decisions to stakeholders.

There are a number of decision-analysis tools that can assist managers in risk-funding evaluations. However, because of the complex nature of the problem, a simulation technique lends itself best to the analysis. A description of the cost and risk for each plan is derived by “simulating” the cost of risk funding for the many possible random outcomes. From this analysis, the expected cost and risk associated with different funding plans can be derived and compared with other plans. The

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random components of the loss-cost estimation are the number of losses and the severity of an individual loss. The random components of the financing-cost estimation are the rate at which claims are paid, the interest rate earned on surplus reserve funds and the interest rate paid when a fund deficit occurs.

To illustrate the use of simulation in the risk-funding decision, consider a hypothetical firm with three risk-funding options: (1) to purchase conventional insurance with a $100-per-loss deductible, (2) to purchase conventional insurance with a $500-per-loss deductible or (3) to self-insure all risk. Assume that the expected number of losses for this hypothetical firm is 200 per year and that the expected loss severity is $1,000-per-loss. The simulation cost analysis shown accounts for the fact that claim payments for a given accident year are typically spread out over several years and that interest rates for borrowing and investing funds over this payout period follow a "random walk" pattern. The current economic climate is incorporated in the model interest rates by setting the drift and variability factors to reflect market expectations.

Assume our hypothetical firm has $162,000 set aside in a fund for its annual risk-related costs. This fund is used to pay premiums for conventional insurance and any deductible costs. In the self-insurance plan, the fund is used to pay all loss costs. The risk-related cost to our firm was evaluated over 500 random outcomes. The histograms in Figures 1, 2 and 3 summarize these 500 random outcomes as the value in the fund after all risk-related costs for the year have been paid.

Figure 1 illustrates the ending fund value if the conventional insurance plan with a $100-per-loss deductible is selected. This is the plan in which the firm has shifted most of the risk exposure to the insurance company. The expected ending value of the fund is $1,910, with a worst-case minimum value of $-2,390 and a best-case maximum value of $5,680. There is a small probability (less than 10%) that the ending value of the insurance fund will be negative. In other words, there is less than a 10% chance that the fund will not be sufficient to finance losses.

Figure 2 illustrates the ending fund value if the conventional insurance plan with a $500-per-loss deductible is selected. In this case the firm is retaining more of the risk, which is evident in a greater range of potential outcomes, from $-14,350 to $21,280. The expected ending fund value at $6,880 is higher than that for the $100-
deductible plan, but the potential for a negative ending fund balance is greater, at 15%.

The third self-insurance plan is illustrated in Figure 3. In this case, in which all risk is retained by the firm, the expected ending fund value is the highest, at $12,500. However, the variability of the ending fund value is much greater than the other plans, ranging from $-36,000 to $42,000. The probability of ending with a negative fund value is about 17%.

Based on the simulation analysis, management of our hypothetical firm must compare the cost versus risk of these three risk-funding alternatives and determine which is most in line with the firms risk-tolerance levels. In general, by using simulation analysis to evaluate the risk-funding decision, management will have a better understanding of the true cost of its risk plan in terms of not only the cost of conventional insurance but also the cost of retained risk.

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can Re.” In this report we learn that Munich Re, already the world’s largest reinsurance company, is acquiring American Re, the combination of which will result in a company with “net premiums written” of almost $14 billion, “policyholder surplus” of almost $6 billion and “net income” of $290 billion. Similar consolidations have occurred in other areas, and virtually all knowledgeable observers of the marketplace predict that the world’s reinsurance market is in the process of concentrating itself into a small number of gigantic corporations.

OK, now add the second poke to your pipe, light up and take a puff. Notice the bitter taste? In case you don’t catch my drift, let me explain. What we apparently should anticipate is the consolidation of insurance power into a relatively few hands, the vast majority of which are non-U.S. entities, coupled with an erosion of the ability of policy-issuing insurers to make their own coverage decisions. What that seems to me to guarantee is a situation in which the settlement of large claims becomes even more complicated and drawn out than it is now (heaven forbid!). Even worse, if you put on your really black hat, the ultimate interpretation of policy language drawn by U.S. drafters, issued by U.S. companies to U.S. policyholders, will be vested in “star chambers” in some faraway land ... cloaked in anonymity and insulated from U.S. securities and anti-trust laws.

Regular readers will realize I usually close with a remedy for the ills I discuss. Not this time, however. I have no idea what you or I or anyone else can do about this. All I can suggest is that we hope for the best and keep faith in the American judicial system, because that’s where the problem, if it does develop, will ultimately be settled. When I was in the insurance agency business twenty-five years ago, our motto was “Insure Today - Be Sure Tomorrow.” I’m not sure it works like that anymore, all the pity.

2. BestWeek, August 19, 1996, Release 34.

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FROM NEAR & FAR

Hurricane Fran came ashore at Cape Fear, North Carolina, on the night of September 5. More than 30 people died in storm-related incidents throughout the East and Northeast. Damage estimates at the time of press were close to $1 billion and were expected to exceed $1.5 billion. Insured losses were also expected to reach $1 billion. Most of the damage occurred in North Carolina, but South Carolina, Virginia and Maryland also suffered large losses.

Hurricane Hortense gathered strength before pounding the Caribbean islands, especially Puerto Rico, dropping up to 18 inches of rain before heading north, skirts the Eastern seaboard and turning out into the North Atlantic.

In London the Lutine Bell was rung three times by the chairman of Lloyd's, Mr. David Rowland. Usually the Lutine Bell is rung once for bad news and twice for good news. Rowland said he rang the bell three times to symbolize the three stages of the journey to Lloyd's' recovery: the pain and suffering endured by members, the coming to agreement on the recovery and the beginning of the recovery itself.
Season's Greetings
from the staff of
Robert Hughes Associates, Inc.