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

IS "BIG BROTHER" BECOMING A REALITY?

By Robert N. Hughes

Germans have a very useful word, *doppelgänger*, which refers to a "ghostly counterpart of a living person" supposedly hanging around and participating in sub rosa decisions. George Orwell, in his 1949 novel *1984,* described a terrifying society where constant supervision was maintained by "Big Brother." Is it possible that, quietly but inexorably, such a presence is developing in the insurance industry and, if so, do we care? At the risk of appearing slightly paranoid, I believe the answer to the first question is "yes" and the answer to the second is "We had better."

First let's take a peek into the back rooms of insurance for the benefit of the educated but uninitiated. You may or may not be surprised to learn that insurance companies themselves buy insurance in order to limit their exposure in a single occurrence or in the aggregate. If the policy-issuing company buys insurance, it is called "reinsurance." If a reinsurance company buys reinsurance, it is still reinsurance but is referred to as a "retrocession." Using these vehicles, the insurance industry is able to effectively spread risk worldwide and maintain a relatively stable insurance environment.

Reinsurance has traditionally been considered an arm's-length transaction "between knowledgeable parties" and, as such, not highly regulated. That being the case, the industry has established some rules (through tradition and practice as well as contractually) which govern the business of reinsurance. There are two such rules that over the years have come to be seen

as significantly more important than any other. The first is "Uberrima Fides" (usually seen in the plural Uberrimæ Fidæ), which, for you non-Latin speakers, means "the most abundant good faith." The second abiding rule which has governed reinsurance transactions for centuries is the concept of "follow the fortunes." This means that the reinsurer will "follow the fortunes" of the reinsured company, paying claims which are paid in good faith by the ceding company without "re-arguing" the coverage in the underlying policy.

I have already probably bored you all to tears talking about "Uberrima Fides" in previous writings, so I'm not going to say much more about that. I am going to talk about "follow the fortunes," however, and link that to another recent headline which, when considered together with "follow the fortunes," greatly stimulates my paranoid side.

First, let me cite a recent British House of Lords decision. (Now I know you usually don't hang on every word that comes out of the House of Lords, but trust me on
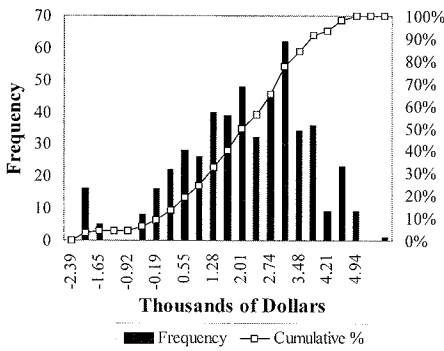
IN THIS ISSUE:

(Analysis, continued from cover)

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

Figure 1: Ending Fund Value $100 Deductible Plan

Thousands of Dollars

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.

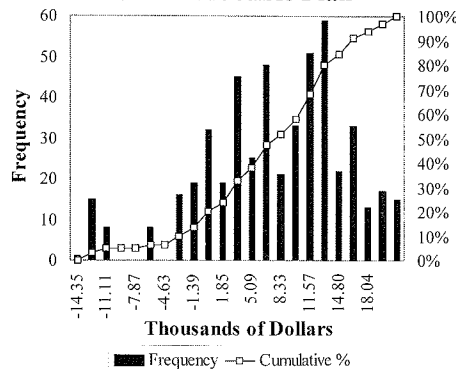**Figure 2: Ending Fund Value $500 Deductible Plan**

Thousands of Dollars

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

Figure 3: Ending Fund Value Self-Insurance Plan

Thousands of Dollars
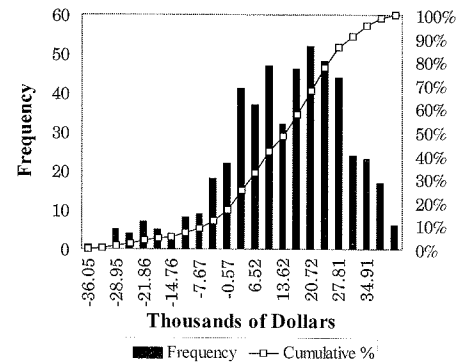
variability of the ending fund value is much greater than the other plans, ranging from - $36,000 to $42,000. The probability of ending with a negative fund value is about 17%.

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. RHA

Dr. Amy v. Puelz is an assistant professor of management information sciences at Southern Methodist University in Dallas, Texas, and serves as an associate consultant to Robert Hughes Associates, Inc. She is a member of the Decision Sciences Institute and the Institute for Operations Research & the Management Sciences.

(BIG BROTHER, continued from cover)

this one.) In a case titled *Hill and Others vs. Mercantile & General Reinsurance Co. P.L.C.*, the House of Lords ruled that reinsurers no longer must simply "follow the fortune" of their reinsured but may instead strongly question claims and refuse to pay on any number of bases, including their interpretation of the underlying coverage. Put simply, this means that your insurance carrier may no longer be able to pay your claim with the confidence that — because they believe it is covered or, more critically, a U.S. court believes it is covered — their reinsurers will automatically pay. Charles Gordon and Chris Jones, partners in the London law firm of Manches & Co., state, "The reinsurer is now free to impose his own definition of the terms of the direct insurance policy and his reinsurance policy without being bound by any decision reached by his reinsured."[1]

Now put that in your pipe for a moment, but don't smoke it just yet. Instead, let's turn the page of this mythical morning newspaper we are perusing. Here we see the headline "Reinsurance Consolidation Continues as Munich Re Acquires Ameri-

can Re."[2] 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 antitrust 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. 🔲

[1] *Business Insurance*, August 5, 1996, p. 39.
[2] *BestWeek*, August 19, 1996, Release 34.

Robert N. Hughes is founder and president of Robert Hughes Associates, Inc.

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.

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

In **London** the Lutine Bell was rung three times by the chairman of Lloyds, 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 Lloyds' 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.