

Twin Risks

BY THE TIME YOU READ THIS ARTICLE, almost every aspect of the Sept. 11 tragedy will have been written about—from the loss of life, terrorism and war, to civil liberties and the effect on the insurance industry. But there's one actuarial aspect it might be useful to focus on—the possibility of an extreme event or, more generally, concentration risk.

As with most actuaries, a significant part of my work relates to risk analysis. However, I normally don't spend much time on the possible implications of extreme event risk due to the concentration of exposures. Actuarial science stresses risk identification, risk measurement, risk prevention, and risk management (from avoidance to hedging to insurance). Although actuaries are taught to reflect fat-tail risks into an expected value calculation, and address them when considering reinsurance, most don't think too much about the implications of the possibility of far out-of-the-money events.

Sure, you might say, that's what reinsurance is for, why liability insurance exists, and why there are insurance guarantee funds. But these are the backstops and cover only some of these risks. In fact, this is the prime reason insurance arose in the first place. One of the most challenging aspects of concentration risk is its identification. You rarely see it until something actually happens. How much at risk are your clients to extreme concentration exposure, market, or liquidity risk?

What types of things can happen? Many disaster-relief plans (e.g., recovery from a home office building that burns down) have been developed over the past few years. But how many are prepared to handle a potentially brand-destroying event, such as an adverse report on *Sixty Minutes*—accurate or not? Or if you had bet too much on the direction of interest rates? Or your top 10 assets being mortgage-backed in the same geographical area or industry?

Actuaries typically look at familiar risks that are relatively close to an expected value. We might think about what would happen if interest rates increase or decrease by three percent for several years, if mortality trend changes by one percent, if loss development is more consistent with paid losses rather than incurred losses, if a series of class action suits goes against your company, or if policyholders behave less than rationally. But in comparison with the events of last September, none of these scenarios seem very extreme.

The lesson is clear—devote sufficient time to scenario planning for possible extreme event and concentration ex-

posures and plan for them. Hold brainstorming sessions. Think about possible adverse events using what might appear to be off-the-wall techniques. If you work for an insurer, how much capital is really needed? It isn't enough to declare that a situation is a one-in-a-hundred event—these arbitrary odds may not provide much solace if similar events occur three times in a decade. This requires recognition of risk concentrations, whether or not directly under your control.

Some believe that stochastic analysis isn't worth much because it's often impossible to derive a true distribution of possible events. Garbage in inevitably leads to garbage out, as estimates can only be as good as the assumptions used. But that doesn't mean that broad assertions or guesses can't be useful. Although most who run stochastic models typically just look at the expected value or, say, the 95th percent confidence interval, it's rare that the worst case run is examined to see what might happen if something extreme did occur. And should the 95th or the 99th percent confidence interval be used, even if the probability distribution is a good one?

It can be really tough to actually predict an extreme risk or to see what concentration of exposures should be managed, avoided, or hedged. In fact in some cases, taking these risks can result in the highest potential sources of profits as well. But it's better to understand the risk/return trade-off.

We should identify families of such possible events and think about the extent of the severity such an event could result in. You may never guess the actual extreme event that will occur, but this might prepare you for one that does occur. Go through your operations and identify those areas that might be so exposed. How prepared is your management? Even though the market might not prize a high level of capital, you should determine its desired level after analysis of the risks you may be subject to. Act in a sound, reasoned, and preventive way.

And at the same time, think about personal extreme events—death, disability, very long life, property loss, or job loss. Have you thought about these lately? Although they shouldn't raise your stress level, and maybe you can't always model them or believe they'll affect you, thinking about them might enable you to take steps to minimize their possibility or their cost. ●

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