SOCIETY OF ACTUARIES

Article from:

Risk Management

November 2005 – Issue 6

The Casualty Actuarial Society

The CAS Working Party on Elicitation and Elucidation of Risk Preferences

by David L. Ruhm

Risk *preferences* is a topic that is pertinent to enterprise risk management (ERM). In managing risks across an enterprise, risk managers have to make many risk evaluation decisions that are necessarily based on some degree of judgment. Often this involves evaluating tradeoffs between various risks and associated mitigation costs. In order to quantify the seriousness of various potential adverse events, judgments have to be made as to what constitutes an actionable event, what metrics to use, etc. Risk preferences–decisions about which risks and costs are more or less preferable–drive such judgments, whether they are explicitly expressed as part of the system or implicit in the decisions.

Recently, the Casualty Actuarial Society's Working Party on Elicitation and Elucidation of Risk Preferences submitted its final report to the CAS, which was published in the Fall 2005 edition of the CAS *Forum*. The report explains the relevance of risk preference elicitation in the context of ERM and provides the actuarial community with an introduction to some pertinent concepts and techniques. A summary of the report's main ideas follows.

Interest in risk management has grown dramatically in recent years for several reasons, some being: Sarbanes-Oxley, high-profile insolvencies, better understanding of the risks that businesses face and better technology to help us model these risks. For example, an asset-liability manager might do extensive simulations that would not have been feasible 10 years ago.

Eliciting management's risk preferences and making them explicit can serve several worthwhile purposes. First, the company can be operated from a coherent risk management policy instead of having isolated, unorganized and potentially conflicting individual judgments about which risks to avoid and at what costs. Furthermore, risk management strategy is an important element of long-term strategic planning. Documentation of risk management strategy might become more formalized as a requirement in the future. Finally, making acceptable tradeoffs explicit is the first step to ensuring they are consistent, transparent and ultimately implemented in daily decision-making at all levels.

While risk management has meant different things in different environments, a first step for the risk manager is to determine senior management's risk preferences. Although this is a first step, it is not a trivial task. A great deal of work may be required for senior management to reach consensus on the company's risk tolerance.

The working party left aside any direct treatment of where management's risk preferences come from or what should drive them, as well as all aspects of the management-investors relationship. Instead the focus was on the process of developing a rational framework that can be used by managers to link corporate risk preferences and decision-making.

The main steps in developing this rational framework involve:

- Defining "risk" unambiguously
- Determining the risk measures to be used
- Assessing the context of the company and managers
- Ascertaining risk preferences

Risk is one of those concepts that everyone has an idea about and no two ideas agree, which causes considerable confusion in conversations. As a general starting point, corporate risk can be defined as what makes the executive committee uncomfortable.

One potential stumbling block in risk analysis is to begin with risk evaluation without first establishing specific definitions and measures for the various types of risk. The failure to first

David L. Ruhm, FCAS, is assistant vice president with The Hartford Insurance Group in Hartford, Conn. He can be reached at *david.ruhm@thehartford.com.*

define "risk" and how to measure it can lead to confusion and circular debate about the risk objective. Although it may sound overly simplified, a good initial question for a management team to consider is, "What is risk?"

Identifying corporate goals and considering what can endanger these goals makes it possible to identify specific risks that pertain to these goals. Some common examples are: impairment of surplus, excessive variability of earnings, loss of underwriting discipline or fraud.

The nature of the business will play a large role in answering the question, "What is risk?" For example, it is common among property-casualty (P&C) insurance actuaries to think of risk in terms of the potential *ultimate* loss from a block of business. The metric is often net income in some form (such as GAAP net income or return on equity) and the timeframe is usually ultimate which can range from a year to several decades, depending on the line of business. While most P&C actuaries are probably aware of other risks (such as balance sheet risk) and the significance of annual timeframes, discussions about risk often implicitly assume that risk is defined entirely in terms of ultimate income.

By contrast, many non-P&C actuaries recognize balance sheet exposure as a main risk and over a shorter timeframe, such as one year. Ultimate profitability remains a central goal, but there is also recognition of the need to remain solvent and to maintain strong writing capacity over the long lifetimes of the products. This perspective arises from the nature of non-P&C businesses, specifically: longer product timeframes, high renewal rates which require capacity to be available in the future for renewals and statutory reserve requirements above expected value that utilize capital.

Desirable measures of risk should be objective, transparent and appropriate. An objective measure allows agreement on planning. A transparent risk measure means that it is a measure that is tractable and can be allocated to the components that are driving the risk. An appropriate risk measure is one that matches both the business realities and the culture of the firm. It is important for the risk measures to fit well with the corporate culture so that they will gain the necessary acceptance. The good news is that this fit can reduce the number and kind of considerations of risk. The bad news is the same: culture can create blindness toward real business risks or over-concern with risks that do not have significant impact on goals. In general, it is more important to have a risk measure that is approximately correct and fully accepted, than a perfect risk measure that is not trusted by the key decision-makers.

Risk preferences describe which tradeoffs management is willing to make. In other words, which combinations of risks are more acceptable than others. For example, in the case of ceded reinsurance, management may be willing to accept lower net profitability or even a higher probability of a losing year in exchange for limiting the very worst cases. Risk measures can be used to quantify risk preferences, so that management's risk preferences can be stated in risk management policies and implemented more objectively.

Interviewing is the prime method. This should be done with individuals separately and then reconciled in a group. The interviewer needs to keep in mind the pitfalls of interview methods and of the particular corporate culture. Nigel Taylor's excellent paper, ("Making Actuaries Less Human: Lessons from Behavioural Finance," (Staple Inn Actuarial Society, 2000) mentions a number of sources of bias in interviews, especially around the framing of questions. These biases come up in all phases of risk analysis. Some of the important effects are:

- Decisions are often made by adjusting from an existing position (anchoring).
- People are risk-averse when facing gain but become risk-seeking when facing losses (prospect theory).
- The frequency with which something is monitored can impact the decision (myopic loss aversion).
- People have a tendency to ignore underlying probability distributions.
- Almost everybody is overconfident.

There are a number of established techniques for surveying and interpreting the results. Several are discussed in the report, including

continued on page 8 ◗

The CAS Working Party on Elicitation...

◗ continued from page 7

the Delphi technique, quality functional deployment and conjoint analysis.

Some of the main behavioral finance results that are pertinent to eliciting and elucidating risk preferences are discussed. Kahneman and Tversky have published many papers that chronicle the surprising results consistently obtained from relatively simple behavioral experiments involving risk and judgment. For example, in one experiment subjects were given a description of a man and told that he was drawn from a group of 70 percent engineers and 30 percent lawyers. The description used generic phrases such as "high ability" and "well liked." This description was specifically designed to give no information regarding the man's occupation.

> People have trouble incorporating a priori probabilities, which can be the most important factor with qualitative information in estimating probabilities.

Subjects generally estimated the probability of "engineer" to be 50 percent, even though the correct probability with no additional information is the a priori probability: 70 percent. Subjects also estimated the probability at 50 percent when told that the man was drawn from a group of 30 percent engineers and 70 percent lawyers. The a priori probabilities, which were the most important information, were disregarded in the presence of rich, descriptive details even when those details were statistically neutral.

In the risk management context, this is a human reasoning flaw in the perception of risk. People have trouble incorporating a priori probabilities, which can be the most important factor with qualitative information in estimating probabilities. This could affect management surveys in which the a priori probability of an adverse event is an important aspect of risk exposure.

In conclusion, the report's intent is to raise awareness of the benefits of formally eliciting risk preferences for a company. This effort can lead to a mutually agreed upon framework for evaluating potential strategies. Introductions to techniques and references are provided to aid interested readers in pursuing the subject further. ✦