Featured in this issue

Patricia Ancipink (REX—A New Channel for the Placement of Facultative Reinsurance) is assistant editor of Best’s Review. Her article explains the concept of The Risk Exchange, better known as REX, and how it may affect the conduct of the facultative reinsurance business. A computer-driven network, REX will facilitate, by means of an overnight batch-feed system, the ceding and acceptance of offers of facultative reinsurance. The system is designed to generate cession files (retrievable in hardcopy), maintain accounting records, and report net cash balances to subscribers on a daily basis. REX, now in test phase and scheduled to become operational later this year, will not challenge the underlying principles of the reinsurance business, but will facilitate placement and, once in widespread use, will provide economies of scale.

John E. Linster (The Future of Medical Malpractice Insurance) is retired senior vice president of Employers Insurance of Wausau. The industry is divided in its predictions for the future of medical malpractice insurance, some experts believing that its problems have been solved by legal changes and increased availability and affordability of coverage, while others think that a crisis is in the offing. Mr. Linster explores the current malpractice situation, illustrating the reasoning behind both viewpoints. To forecast the future he reviews the malpractice insurance crisis of 1974-1975 and the subsequent developments in the legislatures, courts and the insurance marketplace. Mr. Linster feels that the future of malpractice insurance is in the hands of juries, courts and legislators. The industry can help them make informed decisions if it educates them to understand the economics of malpractice and their role in keeping awards within reasonable bounds.

Allan D. Grody and Donald C. Meriam (Securities’ Depositories and the Insurance Industry) are, respectively, director and manager of the National Investment Services Group of Coopers & Lybrand. The idea of immobilizing securities in a depository has won increasing acceptance in the banking and insurance communities. In this article the authors explain how the concept works in practice and highlights its many benefits for both businesses. With this background they outline the progress in the industry in moving towards a depository environment, noting that an NAIC task force is working on a plan to rescind restrictive impediments to insurers’ greater use of depositories.

Thomas C. Laughlin and Daniel P. Kedzie (Management by Objectives or Mostly Blundering Onwards?) are president and executive vice president, respectively, of Management Programs Inc. of Glen Ellyn, Ill., and their column, Management Today, appeared from April 1969 until April 1973 in Best’s Review. In this issue, Management Today returns on an irregular frequency. This “first” article examines the management by objectives program—a theory which calls for management and key employees to mutually negotiate the objectives which the employees are to achieve over a certain time period. The authors discuss the moderate success of MBO based on surveys and their own experiences as consultants. They analyze three general advantages of MBO, concluding that the plusses outweigh the minuses.

Brad Borkan and Howard Kunreuther (Contingency Planning Against Low Probability Events) are a Ph.D. student and professor and chairman, respectively, of the Department of Decision Sciences at the Wharton School of the University of Pennsylvania. This article discusses the similarities and differences between home-owners and corporate risk managers and their approaches to low probability-high loss events, such as earthquakes and floods. Once the homeowner perceives the hazard as threatening, he must make decisions on purchasing insurance. The authors detail the thought processes of the homeowner involved in making these purchase decisions—which often are based on limited knowledge. In turn, risk managers must equip themselves with relevant, accurate and objective information on hazards and the probability of their occurrence. In neither case, the authors conclude, is the decision as to insurance coverage necessarily based on available factual data.

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"Our intention . . . is to encourage thought about the risk management decision process in terms of the cognitive difficulties individuals face in making decisions about low probability events. . . ."
therefore giving him more detailed, albeit imperfect, information on which to base decisions.

Alternative Models of Choice

"Models of choice" is the term used among economists and other decision theorists describing different strategies which may be used in reaching a decision. The model being used by an individual has implications for the quality of the decision, the types of information needed to make it, and how this information will be evaluated. The risk manager functions as an individual within an organization; his decision process bears certain similarities (as well as differences) to that of an individual homeowner, as cited earlier. Both are considering protection against a low probability event with potential catastrophic financial consequences. Therefore, it is useful to examine current theories of an individual's decision-making processes.

Individual Decision-Making

Most economists traditionally have believed that a homeowner decides whether or not to buy disaster insurance by comparing the insurance premium with the potential damage to his property and the probability that the disaster will occur. If the premiums are lower than the expected financial benefit associated with protection then insurance is attractive; otherwise it is not. In other words, the individual is assumed to behave completely rationally. This is a normative theory of decision-making.

An alternative way of viewing the decision-making process has been called the "bounded rationality approach" (Simon, 1955). According to this theory, a person is reluctant to collect data on insurance unless motivated to do so by some external event, such as a recent disaster. Even then he may seek information only from easily accessible sources, such as friends or newspaper articles. This approach implies that an individual will neglect to purchase insurance because of his lack of knowledge of the subject—not because he has studied the matter carefully and concluded that the cost/benefit ratio is unattractive. This model of choice is an example of a descriptive, or behavioral, decision-making process.

Organizational Decision-Making

As with individual decision-making there is a distinction between normative vs behavioral theories of the firm's decision-making process. The normative theory states that firms should behave so as to maximize profits and that they should operate with "perfect knowledge" or at least knowledge of probability distributions of all possible states in the world; it is neat and simple, and easily related to standard views of the risk management process. It assumes that competition within the marketplace motivates the behavior of the organization and its members. Their choices are supposedly based upon cost benefit analyses that involve enumerating all alternatives, assigning probabilities to (Continued)
all consequences and making the necessary computations to determine the most desirable course of action. The risk management process is frequently defined in just these normative terms. That is, risk managers should follow these prescribed steps: (1) identification and analysis of exposures, (2) formulation of alternatives, (3) selection of the best alternative, (4) implementation of chosen alternative, (5) monitoring results, and (6) modification of the implemented alternative, if necessary (Head, 1977).

In contrast, the behavioral theory of the firm (Cyert and March, 1963) states that such key variables as organization goals, expectations and choices are not determined by competition, profit maximization or cost/benefit analysis, but rather by coalitions, past behavior, standard operations and hope. In addition, the firm only partially resolves internal conflicts, avoids uncertainty, searches for solutions only when motivated by problems and learns only through experience, all in violation of the precepts of the normative theory of the firm.¹

Using the behavioral theory of the firm to structure the risk management process raises some disturbing possibilities regarding the validity of the decisions made. Risk managers may make decisions that are not in the best interest of the organization from a profit standpoint. It may be found that the goals of the risk management unit conflict with the goals of the firm; for example, the risk management unit may become unnecessarily conservative and thus over-insure risks in the reaction to being held accountable for losses that they justifiably under-insured. The behavioral theory also suggests that risk and uncertainty may not be handled through probabilistic analysis but through short run feedback-react procedures. In other words, the risk manager may make incremental decisions concerning, say, the level of self-insured retention, waiting to get feedback on the cost of uninsured losses.

The search for alternatives in risk management decisions may be limited, biased, and most likely in response to immediate problems rather than an on-going search for opportunities. The criteria for choosing an alternative may result in the selection of the first alternative that satisfies some minimum standard. Hence, the best alternative may never reach consideration. Lastly, the risk manager learns from his own personal and organizational past experience; his future decisions will be based upon and thus limited by his past decisions and their consequences. This is also one means of risk avoidance and a mechanism for simplifying the decision process. For example, he may automatically use what worked before regardless of changes in the environment.

Which Theory is Correct?—Empirical Evidence on Homeowners ²

In a recent study of homeowners, Kunreuther et al (1978) used field survey questionnaires and controlled laboratory experiments to increase the understanding of decision processes regarding low probability events. The field survey of 3000 homeowners in flood and earthquake prone areas enabled us to discover differences between insured and uninsured homeowners, while the laboratory experiments permitted identification of causal relationships between variables by specifically controlling the variable levels.

The analysis of field survey data shows that most homeowners have extremely limited knowledge of the nature of the hazard facing them or of protective measures such as insurance. The results of the laboratory experiments on insurance provide a better understanding as to why individuals know and do so little about these hazards: they suggest that people refuse to attend to or worry about events whose probability is below some threshold, the level of which differs across individuals and situations. Taken together these results strongly imply that individuals are not comparing the costs and benefits of insurance as predicted by a normative model. Instead, they are relying on such unreliable factors as past experience and discussions with friends and neighbors in making their decisions. These general conclusions can be illustrated with a number of specific results listed below.

Knowledge of Insurance

Although most uninsured homeowners were aware that flood and earthquake coverage existed, the majority were unaware that they were eligible to purchase a policy. Those who were aware that they could buy coverage had neither knowledge of the terms of a policy nor accurate information.
Knowledge of Hazard

Practically all homeowners were able to provide estimates of the anticipated losses to their property from a future severe flood or earthquake. In the case of homeowners in earthquake-prone areas of California, there was a general tendency to overestimate the potential damage. Almost 70% of the respondents thought that a severe earthquake would cause more than $10,000 damage to their property. Since practically all homes in California are wood-frame structures, which normally withstand severe shaking without much damage, the actual losses likely would be much less.

Homeowners were also asked to estimate the probability of a severe flood or earthquake causing damage to their property during the next year. Approximately 15% of the flood respondents and 8% of the earthquake group were unable to provide such a figure. The insured homeowners generally had higher estimates of the chances of a severe flood or earthquake than non-policyholders. Even so, some insured individuals felt that a severe flood causing damage to their property was almost impossible (1 in 100,000 or less), while there were some uninsured homeowners who estimated the probability to be quite high (one in 10 or higher). It is not clear from the field survey data whether people understand the concept of probability and whether they have thought about the chance of occurrence of relatively low probability events.

Knowledge of Federal Aid

One possible way to explain the lack of thought given to either the hazard or the insurance option is an expectation by homeowners that the federal government will provide them with liberal disaster relief should they suffer losses. The data from the field survey do not support this hypothesis. Although most homeowners were aware that the Small Business Administration provides aid to victims, the respondents generally had little knowledge of the loan terms or whether they could receive forgiveness grants from the SBA.

Even more important, most homeowners said they did not anticipate turning to the federal government for aid should they suffer losses from a severe earthquake or flood. Insured individuals would have little need for such relief, but uninsured victims would be forced to rely on their own resources for recovery. Yet approximately three-quarters of the flood and earthquake non-policyholders who estimated their losses to be $10,000 or less expected no aid from the federal government. For uninsured homeowners expecting losses in excess of $10,000, a majority did not anticipate turning to the federal government for any relief.

Based on these results, we conclude that most homeowners in hazard-prone areas have not even considered sources of financing for recovery should they suffer flood or earthquake damage. Rather, they treat such events as having a probability of occurrence sufficiently low to ignore the consequences.

Basic to the decision to purchase insurance is the homeowner's perception that the hazard really is a serious problem. The principal factor influencing this perception is the individual's past experience with the hazard.

The importance of suffering severe damage before buying insurance is illustrated by the comment of one homeowner in Norristown, Pennsylvania, who had not purchased a policy before tropical storm Agnes:

You ask me why I didn't have insurance before the June 1972 flood. We had the flood in September of '71 and I had two feet of water in my basement. And I felt, 'This I can tolerate, and this is probably as high as it will ever get.'

To his chagrin, this individual suffered severe property damage in (Continued)
1972 and then decided that he needed insurance.

The following response also suggests the importance of past experience in prompting homeowners to buy coverage:

I've talked to the different ones that have been bombed out. This was their feeling: the $60 (in premiums) they could use for something else. But now they don't care if the figure was $600. They're going to take insurance because they have been through it twice and they've learned a lesson from it.

For such individuals the notion of insurance apparently has meaning only after there is tangible evidence that they would have reaped a return from investing in a policy.

The field survey data revealed that a much larger proportion of the policyholders than non-policyholders had discussed insurance with a friend, neighbor, or relative. A larger proportion of insured homeowners also knew someone who had purchased a policy. The following example highlights the importance of this factor in the insurance purchase decision. In a pretest of the earthquake questionnaire in San Francisco, a homeowner responded to a question by saying that he did not have insurance against earthquake damage. A friend who was listening to the interview could not resist commenting that he himself had purchased earthquake insurance a couple of years before. The respondent was dumbfounded and asked the friend about the availability of coverage and its cost. He then added, "I am going to have to look into earthquake insurance myself."

Evidence from the field survey and laboratory experiments indicate that individuals are primarily interested in buying insurance if they feel that the probability of a disaster is high enough for them to stand a good chance of getting a return. They view insurance as an investment rather than as a protective activity.

The following rationale given by an uninsured homeowner not purchasing a policy suggests that he considered only the chances of a flood occurring without thinking about the potential losses resulting from such an event:

Say the going rate is $60. When you sit down and figure out the chances of a flood, you say, 'I could use that $60 for something else. We'll take our chances.' And this is the outlook that the majority of the people take.

Similar feelings were expressed by homeowners in the group-depth interviews. The following comments made in Bakersfield, California illustrate this attitude with respect to earthquake insurance:

I think $2 per $1000 (coverage) when you consider the odds is ridiculous. How often does an earthquake occur? I mean, what are the odds? You have to pay the insurance company $40 a year for how many years before you have even a tremor in earthquake country.

All of these insights into the decision process of individual home-
owners buying earthquake or flood insurance have implications for the decision-making of all individuals faced with low probability-high loss events, including risk managers in an organization.

Organizational Decision-Making

An understanding of the personal risk management decision process of homeowners raises two important questions about the decision process of corporate risk managers. First, how adequate is their performance, and second, what can be done to facilitate their decision-making.

The study of homeowners suggests that individuals make insurance purchase decisions with limited knowledge. Also Slovic (1971) and Tversky and Kahneman (1974) have shown that certain biases and heuristics affect individual decision-making. These studies, coupled with Cyert and March's behavioral theory of the firm and our recognition of risk managers as individuals acting in organizations, all have an impact on how we view the decision process of risk managers. Specifically we hypothesize that:

1. Past experience plays a significant role in risk managers' decision processes. Like homeowners, the recognition and treatment of a certain exposure by risk managers may be a function of the ease with which relevant experiences can be brought to mind.

2. Once the risk management function becomes fully integrated in the firm, standard operating procedures will be instituted. The reason for this is that such procedures ease decision-making and help in avoiding uncertain situations. This means that specific tasks, such as evaluation of risks, may become routinized, inhibiting the consideration of better alternatives. This is especially detrimental in situations where the environment changes but standard procedures remain the same.

3. The higher-up in the organization the risk manager reports, the less the conflict of organizational goals with those of the risk management unit, because close communication between the unit and senior management will allow resolution of differences before final decisions are reached.

4. The risk manager has a more formal decision process than the homeowner; however, it is not the six-step normative approach cited previously. The reason for this hypothesis is that risk managers are held accountable by the firm for their decisions and have more resources available to them than the homeowner. However, due to their heuristics and biases risk managers are not behaving normatively.

5. Like homeowners, risk managers attend to risks only when they are above a certain threshold, or when immediate, crisis-oriented action is required.

6. Interpersonal communication plays a key role in the risk manager's decision process. In studying a risk manager's decision processes additional factors (continued)

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that may affect their performance should also be examined. These include the size of the firm, the authority and autonomy of the risk manager, the nature of the risks involved, and the degree to which the risk manager will be held accountable.

The above hypotheses imply that risk managers may be utilizing other decision rules than those suggested by normative theories of the firm and thus may not always be operating so as to maximize the firm's profits. In order to determine the quality of a risk manager’s decision it is necessary to understand the process by which the decision was made. Our intention in setting forth these hypotheses is to encourage thought about the risk management decision process in terms of the cognitive difficulties individuals face in making decisions about low probability events, rather than in six-step normative approaches.

Policy Implications

If risk managers are making decisions using the processes proposed by the behavioral theory as we have suggested, then certain actions should be taken to make their decision-making easier. The first suggestion involves the supply of information to the risk manager. As we have seen, people will consider insuring themselves against low probability-high consequence events only if they are convinced that the chances of occurrence are high enough to warrant concern. Therefore, risk managers must have an accurate and objective estimate of the probabilities of an event occurring; to achieve this they must be supplied with relevant and understandable information on hazards.

The second pitfall for risk managers is the analysis of the supplied information. In interpreting the data, risk managers should be aware of the heuristics they employ and the biases they bring to their decision-making. Awareness and understanding of these prejudices will increase their objectivity. A final helpful measure is the use of computer-based simulation models. In particular, these models may be used to assist risk managers in evaluating the possible outcomes of different hazard situations and testing the value of various possible decisions.

The study of the decision processes used by homeowners in purchasing flood and earthquake insurance is a starting point for understanding how individuals, both as members of families and organizations, make decisions about low probability-high loss events. Since risk managers make such decisions every day on a larger scale than homeowners, it is important to be aware of the adequacy of their decision-making and to work towards the development of tools to aid their decision-making.

(From a paper delivered at the 57th annual conference of the Insurance Accounting and Statistical Association in Boston.)