MANAGERIAL PERSPECTIVES ON RISK AND RISK TAKING*

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This paper explores the relation between decision theoretic conceptions of risk and the conceptions held by executives. It considers recent studies of risk attitudes and behavior among managers against the background of conceptions of risk derived from theories of choice. We conclude that managers take risks and exhibit risk preferences, but the processes that generate those observables are somewhat removed from the classical processes of choosing from among alternative actions in terms of the mean (expected value) and variance (risk) of the probability distributions over possible outcomes. We identify three major ways in which the conceptions of risk and risk taking held by these managers lead to orientations to risk that are different from what might be expected from a decision theory perspective: Managers are quite insensitive to estimates of the probabilities of possible outcomes; their decisions are particularly affected by the way their attention is focused on critical performance targets; and they make a sharp distinction between taking risks and gambling. These differences, along with closely related observations drawn from other studies of individual and organizational choice, indicate that the behavioral phenomenon of risk taking in organizational settings will be imperfectly understood within a classical conception of risk.

(DECISION MAKING; RISK; MANAGEMENT)

1. Risk as a Factor in Decision-Making

The importance of risk to decision making is attested by its position in decision theory (Allais 1953; Arrow 1965), by its standing in managerial ideology (Peters and Waterman 1982), and by the burgeoning interest in risk assessment and management (Crouch and Wilson 1982). However, empirical investigations of decision making in organizations have not generally focused directly on the conceptions of risk and risk taking held by managers (March 1981a); and empirical investigations of risk in decision making have not generally focused on managerial behavior (Vlek and Stallen 1980; Schoemaker 1980, 1982; Slovic, Fischhoff and Lichtenstein 1982). As a result, the relation between decision theoretic conceptions of risk and conceptions of risk held by managers remains relatively murky.

The Definition of Risk

In classical decision theory, risk is most commonly conceived as reflecting variation in the distribution of possible outcomes, their likelihoods, and their subjective values. Risk is measured either by nonlinearities in the revealed utility for money or by the variance of the probability distribution of possible gains and losses associated with a particular alternative (Pratt 1964; Arrow 1965). In the latter formulation, a risky alternative is one for which the variance is large; and risk is one of the attributes which, along with the expected value of the alternative, are used in evaluating alternative gambles. The idea of risk is embedded, of course, in the larger idea of choice as affected by the expected return of an alternative. Virtually all theories of choice assume that decision makers prefer larger expected returns to smaller ones, provided all other factors (e.g., risk) are constant (Lindley 1971). In general, they also assume that decision makers prefer smaller risks to larger ones, provided other factors (e.g., expected

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value) are constant (Arrow 1965). Thus, expected value is assumed to be positively associated, and risk is assumed to be negatively associated, with the attractiveness of an alternative.

Finding a satisfactory empirical definition of risk within this rudimentary framework has proven difficult. Simple measures of mean and variance lead to empirical observations that can be interpreted as being off the mean-variance frontier. This has led to efforts to develop modified conceptions of risk, particularly in studies of financial markets. Early criticisms of variance definitions of risk (Markowitz 1952) as confounding downside risk with upside opportunities led to a number of efforts to develop models based on the semivariance (Fishburn 1977; Coombs 1983). Both variance and semivariance ideas of risk, however, have been shown to be inconsistent with von Neumann axioms except under rather narrow conditions (Levy and Markowitz 1979; Levy and Sarnat 1984); and this result has stimulated efforts to estimate risk and risk preference from observed prices. This procedure is essentially the approach of much of the contemporary literature on risk in financial markets. One example is the capital asset pricing model that has become one standard approach to financial analysis (Sharpe 1964, 1977). It defines the degree to which a given portfolio covaries with the market portfolio as the systematic risk. The residual (in a regression sense) is defined as nonsystematic or specific risk. These elaborations have contributed substantially to the understanding of financial markets, but the risk-return implications of the model have not always found empirical support (Gibbons 1982).

There are numerous additional complications with decision theoretic conceptions of risk when they are taken as descriptions of the actual processes underlying choice behavior. There are suggestions, for example, that individuals tend to ignore possible events that are very unlikely or very remote, regardless of their consequences (Kunreuther 1976). There are suggestions that individuals look at only a few possible outcomes rather than the whole distribution, and measure variation with respect to those few points (Boussard and Petit 1967; Alderfer and Bierman 1970); and that they are more comfortable with verbal characterizations of risk than with numerical characterizations even though the translation of verbal risk expressions into numerical form shows high variability and context dependence (Budescu and Wallsten 1985). There are suggestions that the likelihoods of outcomes and their values enter into calculations of risk independently, rather than as their products (Slovic, Fischhoff and Lichtenstein 1977). Such ideas seem to indicate that the ways in which human decision makers define risk may differ significantly from the definitions of risk in the theoretical literature, and that different individuals will see the same risk situation in quite different ways (Kahneman and Tversky 1982).

**Attitudes toward Risk**

Early treatments by Pratt (1964), Arrow (1965) and others, as well as more recent work (Ross 1981), assumed that individual human decision makers are risk averse, that is, that when faced with one alternative having a given outcome with certainty, and a second alternative which is a gamble but has the same expected value as the first, an individual will choose the certain outcome rather than the gamble. Thus, it follows that decision makers would normally have to be compensated for variability in possible outcomes; and the greater the return on investment that is observed in a situation, the greater should be the variance involved. Levy and Sarnat (1984) studied 25 years of investments in mutual funds and discovered that investors were averse to the variance of returns. It is not certain, however, that managers believe that risk and return are positively correlated. Some studies of mergers (Brenne and Shapira 1983; Mueller 1969) suggest that this is not the case. Moreover, the aggregate data yield ambiguous
results. Bowman (1980) has shown a negative relation between traditional risk (i.e., simple variance) and average return across industries.

Attitudes toward risk are usually pictured as stable properties of individuals, perhaps related to aspects of personality development or culture (Douglas and Wildavsky 1982); and efforts have been made to associate risk preference with dimensions of personality, such as achievement motivation (McClelland 1961; Atkinson 1964; Kogan and Wallach 1964). Global differences between presumed risk takers and others within a culture or job have, however, remained relatively elusive. For example, Brockhaus (1980) attempted to study the risk taking propensities of entrepreneurs. The individuals who quit their managerial jobs and became owners of business or managers of business ventures were compared to regular managers. Using the choice dilemma questionnaire of Kogan and Wallach (1964), he found no differences in risk propensity among the different groups.

It is possible that risk preference is partly a stable feature of individual personality, but a number of variable factors such as mood (Hastorf and Isen 1982), feelings (Johnson and Tversky 1983), and the way in which problems are framed (Tversky and Kahneman 1981) also appear to affect perception of and attitudes toward risk. In particular, Kahneman and Tversky (1979) have observed that when dealing with a risky alternative whose possible outcomes are generally good (e.g., positive monetary outcomes), human subjects appear to be risk averse; but if they are dealing with a risky alternative whose possible outcomes are generally poor, human subjects tend to be risk-seeking. This pattern of context dependence is familiar to students of risk taking by animals (Kamil and Roitblat 1985), individuals (Griffith 1949; Snyder 1978; Laughhunn, Payne and Crum 1980; Payne, Laughhunn and Crum 1981), and organizations (Mayhew 1979; Bowman 1982). It forms the basis for several modern treatments of context-dependent risk taking (Maynard Smith 1978; Kahneman and Tversky 1979; Lopes 1987; March 1988).

There are unresolved problems, however. The idea of risk taking in the face of adversity certainly finds support, but the idea that major innovations and change are produced by misery is not well-supported by history. For example, Hamilton (1978) analyzed the structural sources of adventurism using demographic data from the days of the gold rush in California. He found that gold rush “entrepreneurs” were primarily professionals, upper class and young. They were not from marginal social groups. More inclusive studies of innovation (Mansfield 1968) and revolution (Brinton 1938) similarly suggest that risk taking is not connected to adversity in a simple way.

Dealing with Risk

In conventional decision theory formulations, choice involves a trade-off between risk and expected return. Risk averse decision makers prefer relatively low risks and are willing to sacrifice some expected return in order to reduce the variation in possible outcomes. Risk seeking decision makers prefer relatively high risks and are willing to sacrifice some expected return in order to increase the variation. The theory assumes that decision makers deal with risks by first calculating and then choosing among the alternative risk-return combinations that are available.

It is not clear that actual decision makers treat risk in such a way. For example, Israeli defense decision makers seem to have dealt with the subject of shelter construction in a way that ignored a decision theory definition of risk (Lanir and Shapira 1984). There are indications that decision makers sometimes deny risk, saying that there is no risk or that it is so small that it can be ignored. A common form of denial involves acceptance of the actuarial reality of the risk combined with a refusal to associate that reality with one’s self (Weinstein 1980). The word “denial” suggests a psychological pathology; it may, of course, be a more philosophical rejection of the relevance of probabilistic
reasoning for a single case, or a belief in the causal basis of events. The tendency for individuals to perceive chance events to be causal and under control has been documented in various experiments (Langer 1975), as has the tendency to develop causal theories of events even when the relations between events are known to be only incidental (Tversky and Kahneman 1982).

2. Managerial Perspectives

Two recent studies of managerial perceptions of risk (MacCrimmon and Wehrung 1986; Shapira 1986) can be used to consider managerial perspectives on these issues. The study by MacCrimmon and Wehrung is based on questionnaire responses from 509 high-level executives in Canadian and American firms and interviews with 128 of those executives (all from Canadian firms). The study by Shapira is based on interviews with 50 American and Israeli executives. The MacCrimmon and Wehrung studies were conducted in 1973–1974. The Shapira study was conducted in 1984–1985. Taken together, these studies provide some rather consistent observations on how managers define risk, their attitudes toward risk, and how they deal with risk.

The Definition of Risk

The managers see risk in ways that are both less precise and different from risk as it appears in decision theory. In particular, there is little inclination to equate the risk of an alternative with the variance of the probability distribution of possible outcomes that might follow the choice of the alternative. Three differences from decision theory are obvious: First, most managers do not treat uncertainty about positive outcomes as an important aspect of risk. Possibilities for gain are of primary significance in assessing the attractiveness of alternatives (MacCrimmon and Wehrung 1986), but “risk” is seen as associated with the negative outcomes. Shapira (1986) asked respondents: “Do you think of risk in terms of a distribution of all possible outcomes? Just the negative ones? Or just the positive ones?” Eighty percent of the executives said they considered the negative ones only. There is, therefore, a persistent tension between “risk” as a measure (e.g. the variance) on the distribution of possible outcomes from a choice and “risk” as a danger or hazard. From the former perspective, a risky choice is one with a wide range of possible outcomes. From the latter perspective, a risky choice is one that contains a threat of a very poor outcome.

Second, for these managers, risk is not primarily a probability concept. About half (54%) of the managers interviewed by Shapira (1986) saw uncertainty as a factor in risk, but the magnitudes of possible bad outcomes seemed more salient to them. A majority felt that risk could better be defined in terms of amount to lose (or expected to be lost) than in terms of moments of the outcome distribution. This led the vice-president of a venture capital firm to say, “I take large risks regarding the probability but not the amounts.” And a vice-president for finance reported, “I don’t look at the probability of success or failure but at the volume of risk.” In describing the difference between risk taking and gambling one manager said, “A gamble of one million dollars in terms of success in a project is risk; however, a gamble of half a dollar is not a risk.” This tendency to ignore or downplay the probability of loss compared to the amount is probably better defined as loss aversion (Kahneman and Tversky 1982), or as regret aversion (Bell 1983), than as risk aversion in conventional terms. It is also reflected in the tendency found by MacCrimmon and Wehrung (1986) for less risk taking when greater stakes were involved. In evaluating uncertain prospects, 80% of Shapira’s executives asked for estimates of the “worst outcome” or the “maximum loss.” From such

1 A more complete description of the Shapira study, its methodology, and its results is available on request from the TIMS office in Providence, Rhode Island.
responses, it is difficult to assess the extent to which there are considerations of “plausibility” introduced in determining the possible exposure involved in the alternative. Nevertheless, it is clear that these managers are much more likely to use a few key values to describe their exposure than they are to compute or use standard summary statistics grounded in ideas of probability.

Third, although quantities are used in discussing risk, and managers seek precision in estimating risk, most show little desire to reduce risk to a single quantifiable construct. When MacCrimmon and Wehrung (1986) asked executives to rank nine investment alternatives, the ranks matched an ordering based on expected value in only 11% of the respondents. Even fewer executives ranked the alternatives strictly in terms of maximizing major gain, breaking even, minimizing major loss, or minimizing variation. A vice-president for finance reported (Shapira 1986) that “No one is interested in getting quantified measures”; and a senior vice-president observed, “You don’t quantify the risk, but you have to be able to feel it.” Recognizing that there are financial, technical, marketing, production, and other aspects of risk, a majority of the interviewees in the Shapira study felt that risk could not be captured by a single number or a distribution, that quantification of risks was not an easy task; and 42% argued that there was no way to translate a multidimensional phenomenon into one number. On the other hand, 24% of the same managers felt it could be done and with additional probing said that actually it should be. As one project manager said, “Everything should be expressed in terms of the profit (or loss) at the end of the project, shouldn’t it?”. Several felt that one should average the different dimensions and get an overall weighted index of risk, but even among those who thought such a number should be produced, most reported that they didn’t do it that way.

**Attitudes toward Risk**

Managerial risk taking propensities vary across individuals and across contexts. Among the managers interviewed by Shapira (1986), the variation across individuals is seen as resulting from incentives and experience. In keeping with much of the literature, they think some people are more risk averse than others, that there are intrinsic motivational factors associated with risk and encoded as a part of an individual personality (McClelland 1961; Atkinson 1964; Deci 1975). They see these differences, however, as less significant than differences produced by incentives and normative definitions of proper managerial behavior. They feel that a manager who fails to take risks should not be in the business of managing. When asked if they could identify risk prone and risk averse managers, middle level managers were inclined to say that risk prone individuals disappeared as you move up the hierarchy. Higher level managers, on the other hand, feel there is a definite need to educate new managers into the importance of risk taking. In the Shapira study, the inclination to encourage others to take risks increased as one moved up the hierarchy, and MacCrimmon and Wehrung (1986) found that higher level executives scored higher on their risk taking measures than did lower level executives.

Managers recognize both the necessity and the excitement of risk taking in management, but they report that risk taking in organizations is sustained more by personal than by organizational incentives. Shapira (1986) found that managers at all levels generally picture organizational life as inhibiting risk taking on the part of managers. As a result and in contrast to their normative enthusiasm for risk taking, these respondents were mostly conservative when asked what practical advice they would give to a new manager. They did not encourage risk taking. Rather, they said things like: “Let other managers participate in your decisions.” “Don’t gamble.” “Arrange for a blanket.” This negative attitude toward individual risk taking is particularly characteristic of managers who see risk as unconnected to uncertainty, that is as being defined in terms
of the magnitude of a projected loss or gain rather than that magnitude weighted by its likelihood.

Despite this pessimism about organizational incentives for risk taking, or perhaps because of it, most of the managers interviewed by Shapira (1986) portrayed themselves as judicious risk takers and as less risk averse than their colleagues. Similarly, MacCrimmon and Wehrung (1986) found that managers tended to believe they were greater risk takers than they were. The executives studied by Shapira explained their willingness to take calculated risks in terms of three powerful motivations. First, they said that risk taking is essential to success in decision making. 87% of the executives felt that risk and return were related, though they added “ifs,” “buts” and “it depends” to qualify this relation. In general, the managers studied by Shapira (1986) expect the choice of an alternative to be justified if large potential losses are balanced by similarly large potential gains, but they do not seem to think that they would require the expected value of a riskier alternative to be greater than that of the less risky in order to justify choice.

Second, these managers associate risk taking more with the expectations of their jobs than with a personal predilection. They believe that risk taking is an essential component of the managerial role. In the words of a senior vice-president of one firm, “If you are not willing to assume risks, go deal with another business.” This link between risk taking and management is less a statement of the measurable usefulness of risk taking to a manager than an affirmation of a role. As the president of an electronic firm said, “Risk taking is synonymous with decision making under uncertainty.” In keeping with contemporary managerial ideology, he might have added that management is synonymous with decision making. Consistent with such a spirit, both MacCrimmon and Wehrung (1986) and Shapira (1986) found that managers are inclined to show greater propensity toward risk taking when questions are framed as business decisions than when they are framed as personal decisions.

Third, these managers recognize the emotional pleasures and pains of risk taking, the affective delights and thrills of danger. Risk taking involves emotions of anxiety, fear, stimulation and joy. Many of the Shapira (1986) respondents seemed to believe that the pleasure of success were augmented by the threat of failure. One president said, “Satisfaction from success is directly related to the degree of risk taken.” As we shall note below, this excitement with danger is confounded by a concomitant anticipation of mastery, the expectation that danger will be overcome.

These three motivational factors are background for a greater variation in risk taking attributable to contextual factors. The managers interviewed by Shapira (1986) saw themselves and other managers as exhibiting different risk preferences under different conditions, and the MacCrimmon and Wehrung (1986) measures of managerial risk propensity were poorly correlated across decision situations. Some of this variation appears to be idiosyncratic to the details of particular situations, but there is one consistent theme. Both the managers interviewed by Shapira and those interviewed by MacCrimmon and Wehrung (1986) believe that fewer risks should, and would, be taken when things are going well. They expect riskier choices to be made when an organization is “failing”. In short, risk taking is affected by the relation between current position and some critical reference points (Kahneman and Tversky 1979).

Two comparisons organize managerial thinking about how things are going. The first of these is a comparison between some performance or position (e.g., profit, liquidity, sales) and an aspiration level or “target” for it. Most managers seem to feel that risk taking is more warranted when faced with failure to meet targets than when targets were secure. In “bad” situations risks would be taken. Some also feel that attention to the survival of an individual as a manager is involved, that executives will take riskier actions when their own positions or jobs are threatened than when they are safe. A
second comparison is between the current position of an organization and its demise. There is strong sentiment that survival should not be risked. Over 90% of the executives interviewed by Shapira said they would not take risks where a failure could jeopardize the survival of the firm, although one executive commented that “in situations where a competitor threatens the market position of the firm, you have to take one of two risks: not surviving on the one hand and risking new strategies on the other.”

There is some obvious ambiguity in the ideas. Generally, the argument is that a strong position leads to conservative behavior with respect to risk that the danger of falling below a target is minimized. At the same time, however, the greater the asset position relative to the target, the less the danger from any particular amount of risk (Arrow 1965). As one vice-president said (Shapira 1986), “Logically and personally I’m willing to take more risks the more assets I have.” Conversely, performance below a target is argued to lead to greater willingness to take risks, in order to increase the chance of reaching the target; but the poorer the position, the greater the danger reflected in the downside risk. This would suggest that the value attached to alternatives differing in risk may depend not only on whether they are “framed” as gains or losses but also on which of two targets (the “success” target or the “survival” target) is evoked (Lopes 1987).

Dealing with Risk
Early studies of managers (Cyert and March 1963) concluded that business managers avoid risk, rather than accept it. They avoid risk by using short-run reaction to short-run feedback rather than anticipation of future events. They avoid the risk of an uncertain environment by negotiating uncertainty-absorbing contracts. In a similar way, MacCrimmon and Wehrung (1986) found managers avoiding risks in a simulated in-basket task. They delay decisions and delegate them to others.

Other studies suggest that managers avoid accepting risk by seeing it as subject to control. They do not accept the idea that the risks they face are inherent in their situation (Strickland, Lewicki and Katz 1966). Rather they believe that risks can be reduced by using skills to control the dangers. Keyes (1985) pictured entrepreneurs and other risk takers as seeking mastery over the odds of fate, rather than simply accepting long shots. Adler (1980) distinguished among managers who were risk avoiders, risk takers and risk makers. The latter are those who not only take risks but try to manage and modify them. The managers interviewed by MacCrimmon and Wehrung (1986) and by Shapira (1986) are similar. They believe that risk is manageable. Seventy-five percent of the Shapira respondents saw risk as controllable. As a result, they make a sharp distinction between gambling (where the odds are exogeneously determined and uncontrollable) and risk taking (where skill or information can reduce the uncertainty). The situations they face seem to them to involve risk taking, but not gambling. They report seeking to modify risks, rather than simply accepting them; and they assume that normally such a modification will be possible. As the president of a successful high technology company told Shapira, “In starting my company I didn’t gamble; I was confident we were going to succeed.”

In cases in which a given alternative promises a good enough return but presents an unacceptable danger, managers focus on ways to reduce the danger while retaining the gain. One simple action is to reject the estimates. Thus, only two of the 50 executives interviewed by Shapira (1986) said they accept risk estimates as given to them. In most cases, rejection is supplemented by efforts to revise estimates. Seventy-four percent of the managers said they tried to modify the risk descriptions, partly by securing new information, partly by attacking the problem with different perspectives. More importantly, however, they try to change the odds. Managers see themselves as taking risks, but only after modifying and working on the dangers so that they can be confident of
success. Prior to a decision, they look for risk controlling strategies. Most managers believe that they can do better than is expected, even after the estimates have been revised. This tactic, called “adjustment” by MacCrimmon and Wehrung (1986), is reported as a standard executive response to risk. In the Shapira interviews, managers spoke of “eliminating the unknowns” and “controlling the risk.” Managerial confidence in the possibilities for post-decision reduction in risk comes from an interpretation of managerial experience. Most executives feel that they have been able to better the odds in their previous decisions. Thus, managers accept risks, in part, because they do not expect that they will have to bear them.

3. Implications for Understanding Risk Taking by Managers

These empirical observations call attention to three pervasive features of managerial treatment of risk that deviate from simple conceptions of risk and are important for understanding managerial decision making:

In sensitivity of Risk Taking to Probability Estimates

There are strong indications in these studies, as well as in others (Slovic 1967; Kunreuther 1976; Fischhoff, Lichtenstein, Slovic, Derby and Keeney 1981), that individuals do not trust, do not understand, or simply do not much use precise probability estimates. Crude characterizations of likelihoods are used to exclude certain possibilities from entering the decision calculus. Possible outcomes with very low probabilities seem to be ignored, regardless of their potential significance. Where low prior probability is combined with high consequence, as in the case of unexpected major disasters or unanticipated major discoveries, the practice of excluding very low probability events from consideration makes a difference. In a world in which there are a very large number of very low probability, very high consequence possible events, it is hard to see how an organization can reasonably consider all of them. But if, as seems likely, some particular very low probability, high consequence events are certain to occur, the organization is placed in the position of preparing for a world (i.e., a world in which no low probability, high consequence events occur) that is certain not to be realized. It is, of course, not necessarily given that there is an attractive solution to this dilemma, regardless of the treatment of probability estimates; but the practice of ignoring very low probability events has the effect of leaving organizations persistently surprised by, and unprepared for, realized events that had, a priori, very low probabilities.

The insensitivity to probability estimates extends beyond the case of very low probability events, however. Within a wide range of plausibility, it appears to be the magnitude of the value of the outcome that defines risk for managers, rather than some weighting of that magnitude by its likelihood. This is reflected in the use of terms such as “maximum exposure”, “opportunity”, or “worst or best (plausible) case”. The behavior has consequences. It leads to a propensity to accept greater risk (in the sense of variance) when the probability distribution of possible outcomes is relatively rectangular than where there are relatively long tails.

Although it is arguable that this behavior is less intelligent than taking a fuller account of variations in likelihood, it may be useful to observe that the “confusions” of managers about risk are echoes of ambiguity in the choice engineering literature. In decision theory terms, risk refers to the probabilistic uncertainty of outcomes stemming from a choice. In recent treatises on risk assessment and risk management, on the other hand, risk has become increasingly a term referring not to the unpredictability of outcomes but to their costs, particularly their costs in terms of mortality and morbidity (Fischhoff, Watson and Hope 1984). Within the latter terminology, the main focus of concern has been not on variability but on defining trade-offs between a specific “risk”
and other costs, for example, between the frequency and severity of injury and the monetary costs of safety measures. The typical style is to deal with the expected value of the probability distribution over adverse outcomes, rather than any higher moments. Thus, “risk” becomes “hazard”, the expected value of an outcome rather than its variability; and the central insight of theories of decision making under risk—the importance of considering the whole distribution of possible outcomes—tends to become obscured in considerations of “risk”.

Managerial insensitivity to probability estimates may reflect such terminological elasticity among writers on risk and decision engineers, in part. It may also be attributable to some realities of decision making that are not habitually noted by students of rational choice. Typically, none of the guesses of choice are easy ones. Estimating the probabilities of outcomes is difficult, as is estimating the returns to be realized, and the subjective value that might be associated with such returns when they are realized is unclear. Information is compromised by conflict of interest between the source of the information and the recipient. Since these difficulties are particularly acute in the estimation of probabilities, it is entirely sensible for a manager to conclude that the credibility of probability estimates is systematically less than is the credibility of estimates of the value of an outcome; and it is certainly arguable that the relative credibility of estimates should affect the relative attention paid to them.

The Importance of Attention Factors for Risk Taking

Empirical studies of risk taking, including the ones discussed here, indicate that risk preference varies with context. Specifically, the acceptability of a risky alternative depends on the relation between the dangers and opportunities reflected in the risk and some critical aspiration levels for the decision maker. From a behavioral point of view, this contextual variation in risk taking seems to stem less from the revision of a coherent preference for risk (March 1988) than from a change in focus among a set of inconsistent and ambiguous preferences (March 1978). As a result of changing fortunes or aspirations, focus is shifted away from the dangers involved in a particular alternative and toward its opportunities (Lopes 1987).

The tendency for managerial evaluations of alternatives to focus on a few key aspects of a problem at a time is a recurrent theme in the study of human problem solving. Consider, for example, the discussion of “elimination by aspects” by individual decision makers (Tversky 1972), analyses of attention in human problem solving (Nisbett and Ross 1980), the “sequential attention to goals” by organizational decision makers (Cyert and March 1963), or “garbage can models of choice” (March and Olsen 1976). These observations suggest that choice behavior normally interpreted as being driven primarily by preferences and changes in them is susceptible to an alternative interpretation in terms of attention. Theories that emphasize the sequential consideration of a relatively small number of alternatives (Simon 1955; March and Simon 1958), that treat slack and search as stimulated or reduced by a comparison of performance with aspirations (Cyert and March 1963; Levinthal and March 1981; Singh 1986), or that highlight the significance of order of presentation and agenda effects (Cohen, March and Olsen 1972; Kingdon 1984) are all reminders that understanding action in the face of incomplete information may depend more on ideas about attention than on ideas about decision. In several of these theories, there is a single critical focal value for attention, for example, the aspiration level that divides subjective success from subjective failure. The present observations with respect to the shifting focus of attention in risk seem to confirm the importance of two focal values rather than a single one (Lopes 1987; March 1988). The most frequently mentioned values are a target level for performance (e.g., breakeven) and a survival level. These two reference points partition possible states into
three: success, failure, and extinction. The addition of a focus value associated with extinction changes somewhat the predictions about risk attention (or preference) as a function of success.

In general, if one is above a performance target, the primary focus is on avoiding actions that might place one below it. The dangers of falling below the target dominate attention; the opportunities for gain are less salient. This leads to relative risk aversion on the part of successful managers, particularly those who are barely above the target. As long as the distribution of outcomes is symmetric, the dangers and the opportunities covary; but since it is the dangers that are noticed, the opportunities are less important to the choice. For successful managers, attention to opportunities and thus risk taking is stimulated only when performance exceeds the target by a substantial amount.

For decision makers who are, or expect to be, below the performance target, the desire to reach the target focuses attention in a way that leads generally to risk taking. In this case, the opportunities for gain receive attention, rather than the dangers, except when nearness to the survival point evokes attention to that level. If performance is well above the survival point, the focus of attention results in a predilection for relatively high variance alternatives, thus risk prone behavior. If performance is close to the survival point, the emphasis on high variance alternatives is moderated by a heightened awareness of their dangers.

Risk Taking, Gambling, and Managerial Conceit

Managers have a strong normative reaction to risk and risk taking. They care about their reputations for risk taking and are eager to expound on their sentiments about the deficiencies of others and on the inadequacy of organizational incentives for making risky decisions intelligently. The rhetoric of these values is, however, decidedly two-pronged. On the one hand, risk taking is valued, treated as essential to innovation and success. At the same time, however, risk taking is differentiated from “playing the odds.” A good manager is seen as “taking risks” but not as “gambling.” To a student of statistical decision theory, the distinction may be obscure since the idea of decision making under risk in that tradition is paradigmatically captured by a vision of betting, either against nature or against other strategic actors. From that perspective, the choice of a particular business strategy depends on the same general considerations as the choice of a betting strategy in a game of poker. The significance of this parallel has been recognized by decision engineers who have tried, with only modest success, to champion a criterion for evaluating managers that rewards “good decisions” rather than “good outcomes”, arguing that the determination of a proper choice should not be confounded with the chance realizations of a risky situation.

We believe that managers distinguish risk taking from gambling primarily because the society that evaluates them does and because their experience teaches them that they can control fate. Society values risk taking but not gambling, and what is meant by gambling is risk taking that turns out badly. From the point of view of managers and a society dedicated to good management, the problem is to develop and maintain managerial reputations for taking “good” (i.e., ultimately successful) risks and avoiding “bad” (i.e., ultimately unsuccessful) risks, in the face of (possibly inherent) uncertainties about which are which. The situation was described rather precisely to Shapiro (1986) by one senior vice-president. He said, “You have to be a risk taker, but you have to win more than you lose.”

Managers can engage in relatively conscious strategies designed to inflate the perceived riskiness of successful actions, but deliberate efforts on the part of managers to portray themselves as risk takers are only a minor part of the story. Managerial reputations for risk taking rather than gambling are sustained by the ordinary social processes for interpreting life and getting ahead. In historical perspective, we have no difficulty
distinguishing those who have been brilliant risk takers from those who have been foolish gamblers, however obscure the difference may have been at the time they were making their decisions. Post hoc reconstruction permits history to be told in such a way that "chance"—either in the sense of genuinely probabilistic phenomena or in the sense of unexplained variation—is minimized as an explanation (Fischhoff 1975; Fischhoff and Beyth 1975). Thus, risky choices that turn out badly are seen, after the fact, to have been mistakes. The warning signs that were ignored seem clearer than they were; the courses that were followed seem unambiguously misguided.

History not only sorts decision makers into winners and losers but also interprets those differences as reflecting differences in judgment and ability. The experience of successful managers teaches them that the probabilities of life do not apply to them. Neither society nor the managers have any particular reason to doubt the validity of the assessment that successful managers have the skill to choose good risks and reject bad risks, thus that they can solve the apparent inconsistency of social norms that demand both risk taking and assured success. Managers believe, and their experience appears to have told them, that they can change the odds, that what appears to be a probabilistic process can usually be controlled. The result is to make managers somewhat more prone to accept risks than they might otherwise be.

Such risk taking also fits into social definitions of managerial roles. Managers are expected to make things happen, to take (good) risks. Managerial ideology pictures managers as making changes, thus leading to a tendency for managers to be biased in the direction of making organizational changes and for others to be biased in expecting them to do so (March 1981b). In a similar fashion, managerial ideology also portrays a good manager as being a risk taker. Managerial conceits include beliefs that it is possible at the time of a decision to tell the difference between risks with good outcomes and risks with bad outcomes, and that it is possible to manage risks so as to improve on the apparent odds. And such conceits make risk taking seem entirely consistent with the normative expectation that decisions will also reliably turn out well (Keyes 1985).

4. Conclusion

In the tradition of behavioral studies of organizational decision making (March and Simon 1958; March and Shapira 1982), behavioral decision research (Edwards 1954, 1961; Nisbett and Ross 1980; Kahneman, Slovic and Tversky 1982), and the behavioral assessment of risk perception (Slovic, Fischhoff and Lichtenstein 1985; Englender, Farago, Slovic and Fischhoff 1985), we have examined how executives define and react to risk, rather than how they ought to do so. We conclude not only that managers fail to follow the canons of decision theory, but also that the ways they think about risk are not easily fit into classical theoretical conceptions of risk.

These observations make standard conceptions of risk, with their emphasis on trait differences among individual decision makers, problematic as bases for talking about managerial risk taking behavior. To a substantial extent, probability estimates are treated as unreliable and subject to post-decision control, and considerations of trade-offs are framed by attention factors that considerably affect action. Managers look for alternatives that can be managed to meet targets, rather than assess or accept risks. Although they undoubtedly vary in their individual propensities to take risks, those variations are obscured by processes of selection that reduce the heterogeneity among managers and encourage them to believe in their ability to control the odds, by systems of organizational controls and incentives that dictate risk taking behavior in significant ways, and by variations in the demand for risk taking produced by the context within which choice takes place. These factors are embedded in a managerial belief system that emphasizes the importance of risk and risk taking for being a manager.
These features of managerial approaches to risk have implications not only for understanding decision making in organizations, but also for the engineering of risk taking and risk management. It is conventional in modern discussions of management to deplore the pattern of risk taking observed in management. Individual managers are often criticized for taking too many (or too few) risks, as is management as a whole. Proposals for changing the incentives for risk taking are common. The present observations suggest that some of the policies proposed to change risk taking may not match the situation as it is seen by managers. In the short run, if we wish to encourage, or inhibit, risk taking on the part of managers, we probably need to shape our interventions to meet the ways in which managers think. For example, it may be more efficacious to try to modify managerial attention patterns and conceits than to try to change beliefs about the likelihood of events or to try to induce preferences for high variance alternatives.

In the longer run, there are possible implications for the education of managers. The managers who participated in these studies do not follow decision theory very closely. They do not reject the theory in an informed, reasoned way, but rather act according to some rules and procedures that are implicitly at variance with the theory, even while acknowledging it as decision dogma. This suggests that there might be solid prospects for changing managerial perspectives through direct training in decision theoretic approaches to risk and risk management. As we have recorded above, however, the perspectives that managers have are not simply matters of individual taste but are embedded in social norms and expectations. History and common sense both suggest that changes may be relatively slow, responding more to broad shifts in beliefs and formulations than to simple changes in the selection or training of managers.

Before we leap too enthusiastically into a program of comprehensive managerial education and social reform, moreover, we may wish to recognize the elements of intelligence in these managerial perspectives. Although there is ample evidence that the risk taking behavior of managers is often far from optimal, we may want to examine the extent to which the managerial beliefs and behaviors we observe are accommodations of human organizations and their managers to the subtle practical problems of sustaining appropriate risk taking in an imperfectly comprehended world. It is not hard to show that contextually varying risk preferences, insensitivity to probabilities, and managerial illusions are intelligent under plausible conditions (Ibsen 1884; Einhorn 1986; March 1988). Perhaps the most troubling feature of decision theory in this context is the invitation it provides to managerial passivity. By emphasizing the calculation of expectations as a response to risk, the theory poses the problem of choice in terms appropriate to decision making in an uncontrollable world, rather than in a world that is subject to control. It is not intrinsic to that frame that decision makers become passive with respect to modifying the probabilities they face, but that danger is real. We may prefer to have managers imagine (sometimes falsely) that they can control their fates, rather than suffer the consequences of their imagining (sometimes falsely) that they cannot. What are harder to specify are the details of the ways in which such impulses for discovering methods to improve the odds can be meshed with standard "rational" calculations to induce more sensible managerial behavior.²

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