

Kenneth R. MacCrimmon
Donald A. Wehrung

University of British Columbia

The Risk In-Basket*

I. Studying Risky Decisions

When experienced decision makers are presented with a choice between two alternatives, one risky and one relatively safe, which do they choose? Frequently the answer is neither. Consider, for instance, a top-level business executive faced with a threat by a union at a subsidiary company to go on strike unless a time-and-motion study is immediately discontinued. The two obvious actions of the executive are (1) ignore the threat and continue the study or (2) discontinue the study. The typical executive, however, is likely to collect more information (about the potential payoff from the study, about the union's position, etc.), to initiate negotiations with the union leaders, to delay taking any immediate actions, or to delegate the decision to the executives of the subsidiary.

A typical experimental approach to studying decision making under uncertainty is to ask a subject to choose between two lotteries defined

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In this study over 400 top-level executives confronted four risky situations cast in an "in-basket" format. Each situation involved a choice between a risky and a sure alternative. Having the executives respond by writing memos to specify how the situation should be handled allowed an examination of a rich variety of actions for modifying risk. Responses in the form of probability equivalences and rating scales were also obtained. The results showed that the executives had a relatively strong tendency toward risk seeking, particularly when the payoffs were negative. All three response modes gave generally consistent information about risk propensity, but there were significant differences across the four situations. Overall, between one-fifth and one-half the time, the executives attempted to modify the risks especially through collecting new information. Delegating, delaying, and collecting information were positively associated with a desire to avoid risks. The Risk In-Basket was an effective way to assess risk propensity and to study risk modifications.

by monetary consequences. At times, there may be opportunities to collect specified information at a cost but responses involving negotiation or delegation would be irrelevant because of the abstract context. The simplified format allows theories of decision to be related directly to the situation. The standardization allows comparisons to be made across subjects, but obviously there are relatively few things to compare. In addition, the unreality of the simple lotteries may fail to elicit the person's usual decision behaviors.

A field observation or interview approach can uncover a wide range of decision behaviors. This virtue is also a major pitfall since the context becomes so rich that it is very difficult to make meaningful comparisons across decision makers, or even across situations for the same decision maker.

Thus it would be desirable to consider a decision situation of sufficient richness to allow for the major types of behavior and to motivate the decision makers to treat the situation in the same way they would handle a situation encountered in their own job. At the same time the situation should be standardized so that responses by different decision makers can be compared and so that the results can help to cumulate the central body of knowledge of decision making.

In this paper we develop a set of decision situations which, we believe, possess some of these characteristics. The Risk In-Basket is based on the standard two-action paradigm of decision theory. This paradigm forms the core of a series of well-specified, choice dilemma situations which are embedded in an in-basket context.

An in-basket exercise involves having a person play the role of a fictitious manager who must deal with letters, memos, and phone calls that have accumulated in his in-basket. Information about the relationship of the focal person to other individuals in the organization is provided and a limited time is made available for responding to the in-basket items. Although the in-basket has been used for research purposes, it has been used primarily as a vehicle for personnel selection and training (Frederiksen, Saunders, and Wand 1957; Frederiksen 1962).

Studies of in-basket exercises have demonstrated that participants can identify with the prescribed roles, become very involved in the decisions they face, and generally find the experience enjoyable. The fictitious setting allows some standardization across subjects for comparability yet still permits individual personal behavior to be reflected. Moreover, the complexity and involvement generated by this technique, as well as the open-ended response, may serve to mask the research objectives of the exercise. See Gill (1979) for a review of in-basket research.

A consideration in selecting decision contexts for eliciting business risk propensities is the role we expect the executive to play. Because we wish to create decision situations that elicit risk propensities that

can be compared across individuals, asking the executives to play their own role makes these comparisons difficult. In the usual choice dilemmas, the subject is asked to advise 12 different individuals in highly dissimilar settings (Stoner 1961; Kogan and Wallach 1964, 1967). If the situations imply a range of roles for which a person has no experience (e.g., brain surgery), is it within his capability to evaluate them reasonably? And even if a person has sufficient experience with the situations being presented, they may require him to do so much alternating between roles that confusion and inappropriate transference from one setting to the next may underlie the responses. Therefore it is desirable to create situations associated with a single role. Moreover, this role should be one that is meaningful to the people whose risk propensity is being assessed. By asking executives to assume the role of a hypothetical manager and use their own experience and attitudes for making decisions in this role, the executives will more likely display their own risk propensities.

One of the other difficulties with the typical choice dilemma problems is that the consequences are not completely specified. A person is asked what probability of success he would require in order to recommend a career as a concert pianist without being told the consequences of success and failure in that career or the consequences of staying in the current job. Thus differences in responses across individuals or across situations may be due solely to different assumptions about these unknown consequences. Specifying the quantitative aspects of the consequences should remove much of this ambiguity, and one can also calculate the "break-even" probability that separates risk seeking from risk aversion.

In combining the standard two-action paradigm with a role-playing exercise, however, there is the danger of an executive introducing additional considerations so his interpretation of the situation could be different from the decision structure intended. After anticipating, and trying to remove the basis for, such difficulties, one must decide whether the possible complications outweigh the additional interest of a richer context than the standard two-action paradigm.

In summary, the principal characteristics of the Risk In-Basket are (1) it provides a business context in which the executive is asked to play a single hypothetical role, (2) the decision situations are developed around the standard two-action paradigm in which all actions, consequences, and probabilities are well-specified, and (3) various response modes are used to uncover a wide variety of risk-handling activities to provide alternative means for the executives to reveal their risk propensities. In our judgment these characteristics are preferable to those offered by the widely used choice dilemma situations, and they provide a richer setting to explore risk-handling behavior than abstract versions of the standard two-action paradigm.

To the best of our knowledge, this is the first study which has embed-

ded a way of measuring risk behavior into an in-basket format. The use of an in-basket as a context for the two-action paradigm is one of the unique contributions of this study.

Using the Risk In-Basket, we wish to address the following questions. To what extent do executives modify the risky situations facing them, and which adjustment actions are most frequently adopted? Does the context of the risky situation influence the choice of modification used? How risk seeking or risk averse are the executives in the standardized business decisions presented to them? Is the propensity to take risks influenced by the context of the decision situation or the response mode used? Is the propensity to modify risky situations related to risk propensity? We will address these questions in the following sections of the paper.

II. Method

Sample

Top-level executives make many of the important risky decisions in society. The role of these managers frequently requires that risky situations, involving important consequences to the executive and his firm, be confronted on a regular basis. Because we wish to investigate risk behavior in subjects who have responsibility for, and experience with, handling risky situations, senior executives are a natural choice for subjects.

After selecting a list of American and Canadian firms stratified by industry and firm size, we identified several top managers in each firm using a business directory. Two methods for contacting the managers were used. Under the direct-mail method, we sent a letter to each manager describing the study and soliciting participation. The letters were accompanied by the Risk In-Basket and other instruments that dealt with executive risk taking (MacCrimmon and Wehrung 1984). Of the approximately 2,700 managers contacted in this manner, 192 participated in the study. Under the personal contact method, we sent only the letter to key managers. We followed up the letter by phoning each manager asking for an appointment. Whenever the manager agreed to an appointment, we left copies of the Risk In-Basket for the manager and selected associates to complete, after discussing the study with him. Of the approximately 800 managers contacted using this more personal approach, 317 participated. We found no significant differences between the managers contacted by these two different methods.

Forty-five of the executives who sent in their responses did not complete the entire Risk In-Basket. The final sample consisted, therefore, of 464 executives. The typical executive was a 47-year-old vice-president who had been with his firm 14 years and earned \$160,000 (in

1984 dollars). All major functional areas of specialization were represented, and all executives were male.

Tasks

The Risk In-Basket consisted of a 16-page questionnaire that asked each executive to respond to four standardized risky business situations. The executive assumed the fictional role of the newly appointed vice-president for North American operations of Multinational Products, Inc. Arriving in his new office for the first time, he was asked to deal with four items in his in-basket. The four items were (1) a lawsuit involving a patent violation, (2) a customer threat concerning the supplying of a competitor, (3) a union dispute regarding a time-and-motion study, and (4) a joint venture with a competitor. The letter appearing in the in-basket for the lawsuit situation is shown in figure 1.

Each of the four items presented a clear choice between a risky and a safe course of action. Each risky action had two possible outcomes, one favorable and one unfavorable (compared with the sure outcome). The outcomes were clearly specified and so was the probability for the favorable outcome. The similar structure of the four decision situations allowed them to be described using the standard two-action paradigm. The expected value of the risky alternative was equal to the monetary outcome of the sure alternative in each decision situation.¹ Hence neither alternative could be preferred because it offered a higher expected payoff. The basis for choice necessarily involved a consideration of the riskiness of the situation. Each of the four decision situations had characteristics that distinguished it from the others. Some of the more salient features are summarized in table 1.

The setting for the Risk In-Basket was chosen to encourage the executive to respond using only the materials at hand. No outside information was allowed. To discourage delay, the instrument stated that the executive was scheduled to leave for an important business meeting in 35 minutes and would not return for a week. None of the materials could be taken on the trip.

The executive was instructed to read through the materials and, using his own experience as the basis for his decisions as the fictional executive, to specify whatever action he deemed appropriate on each item. These actions were to be written on blank memo sheets, provided in the instrument, and they could be addressed to whomever the executive chose.

After the executive had written his memo responses to each of the four situations, he was asked to provide two other types of responses to each situation. First he was asked to give a rating, on an 11-point

1. Although the expected value of the risky alternative in the union dispute was intended to be equal to the sure alternative, the expected value was ambiguous.

DOMINION INTEGRATED PRODUCTS LTD.

487 WEST 83RD STREET
VANCOUVER 13, CANADA

March 9, 1973

Mr. James Norton, Vice President
Multinational Products, Inc.
North American Headquarters
519 Madison Avenue
New York, N.Y. 10018

Dear Jim:

This is with reference to the PMG case I mentioned in my letter of February 27th. As I indicated, PMG has threatened to sue Dominion Integrated for patent violation. The case has not yet been filed in court, since PMG are waiting to hear our response to their offer to settle out of court. They have proposed that we pay them \$300,000 in cash and agree to drop our Duraplast line, which our finance people estimate would involve an additional loss, in present value terms, of about \$500,000 (10% of our 1972 profit).

If we do not agree to this proposal, PMG will file their suit, which would, if we lose the case, probably involve a loss of \$1,100,000 in damages plus the loss of dropping the Duraplast line. On the other hand, if we win in court, we will incur only a small sum for legal expenses. Our corporate lawyer, Mr. Bell, and our outside law firm agree that the chance of our losing the case in court is 50%.

We have been given one week from today to respond to PMG's settlement offer; I've tried to postpone this deadline, unsuccessfully. What do you recommend?

Please call or wire me as soon as possible. Best regards.

Yours sincerely,



Donald T. Moore
President

DTM/cg

FIG. 1.—In-basket item for lawsuit situation

TABLE 1 Comparison of Decision Contexts

Description	Decision Context			
	Lawsuit	Customer Threat	Union Dispute	Joint Venture
Initiator	Whether to settle a patent violation lawsuit out of court	Whether to comply with customer request to stop supplying competitor	Whether to comply with union request to discontinue a time-and-motion study	Whether to pursue project individually or as joint venture with competitor
Basic decision tree structure	Letter from president of subsidiary	Memo from secretary	Letter from president of subsidiary	Memo from project coordinator of special task force
Sure action:	Settle out of court	Standard two-action paradigm: one sure action and the other action with two possible outcomes Stop supplying competitor	Discontinue time-and-motion study	Pursue project jointly with competitor
Consequence	Lose \$800,000	Lose \$4 million annually	6.5% return on equity	14% return on investment
Risky action:	Fight lawsuit in court	Continue supplying competitor	Continue time-and-motion study	Pursue project individually
Better consequence	Win case	Competitor does not go bankrupt	No union strike	Capture large market share
Worse consequences	Small legal costs	Lose \$3 million annually	10% return on equity	22% return on investment
Probability of better consequence	Lose case	Competitor goes bankrupt	Union strike	Capture small market share
Expected value	Lose \$1,600,000	Lose \$7 million annually	Lose \$200,000	10% return on investment
Nonmonetary consequences	.50	.75	.40	.33
Potential controllability of key uncertain events	Lose \$800,000	Lose \$4 million annually	Ambiguous	14% return on investment
Attitudes regarding decision context	Possible entanglement in protracted litigation	Impact of action on other customers	Impact of strike on customers, employees, etc.	Implications of cooperating with competitor
	Bargain with litigant	Reason with customer	Bargain with union	Negotiate with competitor
	Attitudes regarding threats and settling business disputes in court	Attitudes regarding ethical considerations	Attitudes regarding unions	Attitudes regarding cooperation with competitors

scale, of his inclination to take the sure or the risky action. Then he was asked to assume that the likelihood of success for the risky action had not been specified and to provide the lowest chance for which he would take the risky action. Hence in the lawsuit situation an executive who had taken the sure action (i.e., settling out of court) should have increased the probability of winning the suit from .50 up to the point where he would just be indifferent between the two actions. For an executive who had selected the risky action (i.e., go to court), presumably he would lower the probability below .50 to the point at which he was indifferent between the two actions. These numbers are called probability equivalences. The subject was given the opportunity to check a box indicating that he would select the sure alternative no matter what the chances of success (i.e., probability of 1.0) or to check a box indicating that he would select the risky alternative no matter what the chances of success (i.e., a probability of zero).

The time for completing the Risk In-Basket was specified as 45 minutes. This included 35 minutes for writing the memo responses and 10 minutes for completing the ratings and probability equivalences.

Early applications of the in-basket format to risky-decision situations were made in a series of pilot studies. These applications involved as many as 13 items, including both business and personal situations. An extensive pilot test of 170 undergraduate students and 30 graduate students provided responses on seven items. In addition to the four items in the current instrument it included a new product introduction, a job offer for the executive, and a letter from the executive's son asking for advice on his academic study. The latter item was found to elicit unusable results and was discarded. The remaining six items were further tested in a pilot study of 40 business executives. Although each of the six items was deemed usable, two were dropped to reduce the time requirements for the Risk In-Basket.

Measurement

As mentioned above, there were three distinct response modes for each decision situation. The first was an open-ended memo response in which the executive described in writing how he would handle the situation. His description could entail attempts to modify the risk (e.g., through delegation or collecting information), as well as choices between the two stated alternatives. We shall call this the *memo* response mode. The two other types of responses were much more structured. The one involving the rating on an 11-point scale provided a single number for each executive for each situation. This will be called the *rating* mode. The response involving the specification of the minimum acceptable probability of success also resulted in a single number and it will be called the *equivalence* mode.

Obviously it is most difficult to code and interpret the memo re-

sponses. An examination of a representative subsample of the written memo responses revealed that the memos averaged about 75 words for each decision situation, ranging from a low of 3 words to a high of about 250 words. Most of the written memos were addressed to the author of the in-basket letter or memo.

A content analysis of the written memo responses was performed to characterize the executive's risk propensities. The content analysis was performed using two coders. Both coders had business experience, were familiar with the types of situations described, and had handled memos written by executives.²

The coders were given coding categories which had been developed by the principal investigators during the pilot phase of the study. Each of the coders and a principal investigator independently coded about 100 written memos (4 situations; 25 executives), and the assigned codes were compared. Differences in scoring were discussed to clarify the categories. Finally, the two coders independently scored the remaining written memos.

Three separate scores were coded for each written memo response. The first score characterized the actions specified in the memo in terms of propensity toward riskiness on a nine-point scale.³ The second score (on a five-point scale) described the executive's propensity to seek information. If the executive mentioned bargaining, negotiating, or presenting a new alternative, this was coded in a separate category since it was viewed as an extreme form of information gathering. The third score described the executive's propensity to delay or delegate the decision. Delay and delegation were considered on the same seven-point scale. Some actions, such as collecting information and bargaining, involve delaying the decision. However, they were not coded as delay responses unless they specifically mentioned delaying the decision as well.

III. Results

Reliability of Responses

We obtained complete responses—memos, ratings, and probability equivalences—for all four situations from 464 executives. Before using the scores that were coded for the written memos, it is important to examine the intercoder reliability for the scoring methods. When the coding categories under consideration are at least ordinal, the degree of

2. One coder was 28 years old, married, had obtained a graduate degree in business administration, and was previously employed as an account executive. The other coder was 36 years old, married, had obtained a degree in business administration, and was previously employed in retail sales.

3. Only eight points reflected "riskiness"; the ninth point was used when the response was ambiguous or indefinite.

association is an appropriate measure and Spearman correlation coefficients are suitable.⁴

The degree of association between the raters in coding the memo risk score was moderately high. The correlations ranged from .67 to .87.⁵ We conclude from these results that the intercoder reliability on the memo risk score was sufficiently high to use the eight risk categories as defined.⁶

The intercoder reliability for the memo information score was somewhat lower than for the memo risk score. Including the bargaining responses as an extreme form of information collection yielded acceptable intercoder correlations of .71 and .66 for the lawsuit and customer threat situations. The relatively low degree of association between the coders in the union dispute (.42) and joint venture (.58) situations suggested that some collapsing of response categories would improve the reliability of the data. Subsequently the five-point scale was collapsed into three categories.⁷

Intercoder reliability for the memo delay/delegation score was generally weak when both the delay and delegation codes were considered simultaneously. When the delegation responses were considered separately, reliability was also low. On the other hand, the intercoder reliability was acceptably high (.56-.77) when the delay responses were considered separately.⁸ We conclude that the delay measure is acceptable but that analyses based on the delegation measure must be treated cautiously.

Reingen (1976) presented evidence to show that his sample of college students did not seem to understand the inverse relationship between minimum success probability and risk propensity. He recommended that probability equivalence scales be used carefully. Since we utilized business executives as subjects and our measure of minimum success probability did not appear to be inconsistent with our other measures of risk, we conclude that the variable is adequately reliable.

Risk Modifications

A content analysis of the memos allowed us to examine whether each executive attempts to modify the risks facing him. The four primary

4. When the coding categories are only nominal, an analysis using the degree of agreement is appropriate.

5. The degree of agreement was moderately low (.27-.38) when eight categories were considered, but improved to a range of .49-.59 when the eight risk categories were collapsed to four and the nonaction response was included.

6. Because the nonaction response was excluded from all analyses involving the memo risk score, the sample sizes were 433, 404, 450, and 419 for the four situations, respectively.

7. The degree of agreement was at least .37 for all four decision situations. When the information categories were collapsed into three categories, the degree of agreement improved substantially for all but the union dispute situation.

8. The degree of agreement ranged from .50 to .68.

risk modifications are (1) delay, (2) delegate, (3) collect information, and (4) bargain. Due to the ambiguous way that these tendencies were sometimes expressed in the memos, the classifications made by the coders sometimes differed. By recognizing the modification if either coder scored it, we obtained an upper bound on its frequency of occurrence; by recognizing the modification only if both coders scored it, we obtained a lower bound. We will report both figures, in the form of a range, when presenting results.

Rather than choosing one of the two specified actions, an executive may delay making a choice. Over the four memos, an average of 20% (based on both coders) to 36% (based on at least one coder) specified delay.⁹ Most of these actions involved a temporary delay until the executive returned from his trip; only about 2% of the memos suggested a delay of indefinite duration. The propensity to delay was relatively constant over all four decision situations. Using the frequencies on each memo as marginal probabilities, we found that the number of executives inclined to delay in all four situations was greater than expected by chance. Similarly, the number of executives not mentioning delay in any situation was greater than expected by chance.¹⁰

Delegating a decision to a subordinate or transferring it to another executive on the same or higher level (for simplicity, we call both actions delegation here) is a way of modifying the risks—or even avoiding them altogether. At least 9% (both coders) and perhaps 30% (at least one coder) of the written memos specified some form of delegation. For almost all these delegation specifications the executives also made a recommendation for the action they would take. Hence they were sharing the risks rather than avoiding them completely. Usually the delegation was to the top executive in the subsidiary who had raised the problem in the first place (“... you are clearly in a better position to handle this than I am”). There were about twice as many delegation specifications in the lawsuit and union dispute cases than in the other situations. This could be expected since the lawsuit and union dispute decisions both involved events at subsidiaries while the other two situations occurred at the head office. Combining the individual frequency information, we found that more executives than would be predicted by chance omitted mention of delegation in any of the four situations; the number specifying delegation in all four situations was not significantly different from a random effect.

About half the written memos, 34%–55%, specified the collection of additional information, including an attempt to negotiate with the other

9. Because delegation tends to imply a delay and because it was scored on the same scale, if we remove the delegation-scored memos, the delay percentages became 29%–47%.

10. The test used here and elsewhere in this section was χ^2 based on a binomial model with a significance level of .001.

party. If we excluded bargaining, the percentage specifying new information became 23%–39%. Over all four situations, 13%–26% of the memos specified bargaining. Not surprisingly, bargaining was recommended three times as often in the lawsuit and union dispute decisions as in the other two cases. Correspondingly, there was more interest in collecting additional (nonbargaining) information in the customer threat and joint venture decisions.

Aggregating across all four situations, we found that significantly more executives (35) than would be predicted by chance specified collecting information (including bargaining) in all four decisions. Significantly more executives (66) than would be predicted by chance did not seek to collect information in any of the four situations. When we treated bargaining separately, no executive sought to negotiate in all four situations, although a majority of executives attempted to negotiate in at least one situation.

Riskiness of Responses

The Risk In-Basket provides us with three measures of the executive's risk propensity. Those measures are derived from the scale ratings, the probability equivalences, and the written memos. Thus we can assess risk propensity using different response modes as well as comparing the response modes with each other.

The simplest measure is the risk rating provided by each executive, obtained by having him indicate his risk inclination by checking a position on an 11-point scale. Ignoring the few middle ratings, we found that more than twice as many executives were inclined to take the risky action over the sure action. Thus significantly more executives were risk seeking than risk averse.¹¹ In fact, half of the risk ratings were at the extreme risk-seeking end of the scale.

From an executive's specification of his probability equivalence, we can derive a risk premium.¹² A positive risk premium implies risk aversion, while a negative risk premium implies risk seeking. About 20% of the executives had risk premiums between $-.10$ and $+.10$, which we labeled risk neutral. Among the remaining executives, twice as many had negative risk premiums as had positive premiums. Therefore significantly more executives were risk seeking than were risk averse. In 27% of the cases the executive indicated he would take the risky action no matter what the probability.

The coded risk measure obtained by content analysis from the written memos provided the third measure of risk propensity, the memo

11. The binomial test used here and elsewhere in this section was based on $p = .5$ and a significance level of .001.

12. The risk premium was found by subtracting the break-even probability in each situation (see table 1) from the probability equivalence specified by the executive in that situation.

risk. For this measure about 15% of the cases were judged to be risk neutral and were excluded from this analysis. The actions specified by the remaining executives indicated risk seeking was about twice as frequent as risk aversion. Here, too, significantly more executives were risk seeking than were risk averse.

Comparison of the Three Response Modes

Using the categories risk seeking, risk neutral, and risk averse described above, we made pairwise comparisons in the assessed risk propensities between the response modes. First, for the risk rating versus the memo risk measures, we see in table 2 that for an average of 75% of the executives, there was no difference between these two measures. In the 25% of the cases which differed, the risk rating showed significantly greater risk seeking on average than the memo risk.¹³ Second, for the risk rating versus the risk premium measures, we found no differences between the measures for an average of 70% of the executives. For the cases in which the two measures differed, the risk rating indicated significantly more risk seeking than did the risk premium. Third, for the risk premium versus the memo risk measures, no differences were found for an average of 64% of the executives. When the measures differed, the memo risk score on average showed greater risk seeking than the risk premium, but the variation across situations was so high that no firm conclusion could be drawn. This variation plus other variations across situations will be discussed in the next section.

Table 2 shows that, on average, the risk rating measure reflected greater risk seeking than either the memo risk measure or the risk premium measure. In turn, the memo risk exhibited greater risk seeking than the risk premium. That the risk rating reflected the greatest willingness to take risks was not surprising because it is essentially an attitude measure. Since our culture tends to place a high value on taking risks, attitudinal measures of risk propensity are likely to exhibit greater risk seeking than behavioral measures of risk propensity such as the memo risk and the risk premium.

Further information about the congruence among the three measures was obtained by examining their correlations. In table 3 we see that all these correlations were high (significantly different from zero at .001). The three pairs of measures had about the same degree of congruence.

Comparison of the Four Decision Contexts

The preponderance of risk seeking over risk aversion was found in three of the four contexts; the exception was the joint venture. In the joint venture the risk premium measure indicated twice as many risk-

13. In this section the sign test was used with a significance level of .01.

TABLE 2 Comparison of Risky Behavior across Response Modes by Decision Context (Percentages)

Decision Context	Risk Rating vs. Memo Risk				Risk Rating vs. Risk Premium				Memo Risk vs. Risk Premium			
	Lawsuit	Customer Threat	Union Dispute	Joint Venture	Lawsuit	Customer Threat	Union Dispute	Joint Venture	Lawsuit	Customer Threat	Union Dispute	Joint Venture
Risk rating more	11	15	24	14	33	7	17	27	NA	NA	NA	NA
risk seeking												
Memo risk more	14	7	7	7	NA	NA	NA	NA	38	5	14	25
risk seeking												
Risk premium more	NA	NA	NA	NA	11	13	9	5	11	19	24	8
risk seeking	75	78	69	79	56	80	74	68	51	76	62	67
No difference												
Total	100	100	100	100	100	100	100	100	100	100	100	100

NOTE.—NA means "not applicable."

TABLE 3 Correlations among Risk Measures Using Different Response Modes in the Same Decision Context

Response Mode	Response Mode	
	Risk Premium	Memo Risk
Risk rating:		
Lawsuit	.63	.69
Customer threat	.42	.56
Union dispute	.74	.72
Joint venture	.74	.80
Risk premium:		
Lawsuit		.58
Customer threat		.46
Union dispute		.60
Joint venture		.70

NOTE.—All correlations are significantly different from zero at $p < .001$.

averting responses, compared to risk-seeking responses, while for the risk rating and memo risk measures, the difference was insignificant.¹⁴ The customer threat had a higher number of extremely strong risk-seeking responses than any other decision situation.

The data in tables 2 and 3 showed considerable variability among risk measures derived from the four situations. In the customer threat two of the three pairwise comparisons among the risk measures (table 2) showed a significant reversal from the average.¹⁵ In addition, the customer threat correlations were the lowest over the four situations (table 3). For the joint venture two of the three pairwise comparisons were significantly more extreme (in the same direction) than the average. Furthermore, the joint venture correlations were the highest over the four situations. In the union dispute two of the three pairwise correlations differed significantly from the average with one being a reversal and the other being more extreme in the same direction as the average. The union dispute correlations were the second highest of the four situations. Finally, for the lawsuit all three of the pairwise comparisons were significantly different from the average, with one being a reversal and two being more extreme in the same direction. The lawsuit correlations were the second lowest.

Further evidence of the context effect is shown in table 4. We see that the correlations across situations for each risk measure were very low. This consistency among different risk measures *within* a situation and the lack of consistency *across* situations was confirmed using a

14. The binomial test used here was based on $p = .5$ and a significance level of .001.

15. For each pair of risk measures in table 2, a separate χ^2 test was performed on the frequencies underlying the percentages in the table. The marginal frequencies were used to determine the expected values (called "average" in the text) and the significance level was .01.

TABLE 4 Correlations among Risk Measures Using Same Response Mode in Different Decision Contexts

Decision Context	Decision Context		
	Customer Threat	Union Dispute	Joint Venture
Lawsuit:			
Risk rating	...	...	...
Risk premium	.13	...	.16
Memo risk	...	...	.14
Customer threat:			
Risk rating		...	.15
Risk premium		...	.20
Memo risk		.12	...
Union dispute:			
Risk rating			-.11
Risk premium			...
Memo risk			...

NOTE.—A blank means not significantly different from zero at $p < .01$.

principal components analysis. Four common factors, each representing a different decision context, explained 80% of the variation in the 12 risk measures (i.e., four situations $\times$ three response modes).

We conclude that there were major differences among decision contexts. The joint venture seemed to provide the most consistent risk propensity, and the customer threat and the lawsuit seemed the least consistent across measures.¹⁶ Given the considerable variability across contexts, it would be difficult to justify pooling the measures over the four situations to get an aggregate risk score. This variability across four seemingly related business contexts reinforces our skepticism about aggregating responses in the standard choice dilemmas in which a person confronts situations as diverse as football, brain surgery, concert performance, and job change.

Comparison of Risk Propensity and Risk Modification

The Risk In-Basket memos provided information on the propensities to collect information, to delay, and to delegate as well as the risk propensity itself. It is generally believed that collecting information, delaying, and delegating are indicative of an aversion to risk, but there is little, if any, formal evidence for these hypotheses. For each decision context considered separately, we related the memo risk score with the measures of information collection, delay, and delegation.¹⁷

16. The memos in the customer threat provided strong evidence that nonquantitative factors were important. Most executives thought that it was improper for the customer to threaten to withdraw his business. They were unwilling to give in to such a threat and hence took the action that we label as "risky" (i.e., reject the threat)—but not necessarily for riskiness reasons.

17. The analyses were also performed with the risk rating and the risk premium as the measure of risk propensity, but they gave almost identical results and will not be described.

The propensity to collect information, as measured on a three-point scale, was significantly related to the propensity to avoid risks in three of the four decisions situations.¹⁸ The difference was insignificant for the union dispute.

The propensity to delay, as measured on a two-point scale, was significantly associated with the propensity to avoid risks in two of the four situations. The difference was insignificant for the lawsuit and the joint venture. The propensity to delegate, as measured on a two-point scale, was significantly associated with risk avoidance in the same two situations.¹⁹

We conclude that the executive's propensity to modify risks by gathering information, delaying, or delegating was positively associated with his propensity to avoid risks by choosing a safe alternative in lieu of a risky one. This association was not consistent over all decision contexts.

IV. Summary and Implications

There are nine major findings from our study:

1. *People commonly attempt to modify risky alternatives in various ways rather than simply choosing among them.* The executives in our study did not restrict their attention to the two actions (the risky one and the sure one) presented to them in each situation. In the large majority of cases they attempted to modify the risky situation. One modification involved delegating the decision to someone else. This action was specified about one time in five. While delegation may indicate an attempt to avoid risk entirely, this is mitigated here by finding recommendations for action in most of the delegation instances ("... although you should decide, I'm inclined to fight it out in court"). Just as frequently (i.e., one time in five), the executive wanted to develop new options through bargaining ("... ask the union leader if he would consider working out a mutually satisfactory plan"). Bargaining was most likely when there was an adversarial relation (lawsuit and union dispute).

One time in three, the executives recommended delaying the decision. The delay was seldom for more than a few weeks ("... try to hold off on this until I get back from Mexico City").

18. The original five-point scale was collapsed to three points: (1) no extra information to be collected, (2) extra information to be collected, and (3) attempts to negotiate and collect information. A one-way analysis of variance was used with a significance level of .001.

19. The combined delay-delegation scale was separated into two scales. The first scale indicated the presence or absence of delay while the second scale indicated the presence or absence of delegation. The results of the analyses were based on *t*-tests with a significance level of .001. (The relationship between memo risk and delegation was significant only at the .05 level.)

Most commonly, occurring nearly one time in two, the executives wanted to collect additional information. In the large majority of these cases specific information was requested ("... try to get an independent estimate of our chances of winning in court") and specific actions were stated ("... talk to Peter Davis to find out what's really bothering him").

2. *People show a tendency to use the same risk modification in different situations.* Those executives inclined to delay (or bargain or delegate or gather information) in one decision context were more likely than average to delay (bargain, delegate, gather information) in other situations. Correspondingly, those executives not inclined to delay (bargain, gather information) in a particular situation were less inclined than average to do so in other situations.

3. *The risk modifications of delegating, delaying, and collecting information are each positively associated with a desire to avoid risks.* The executives frequently preferred to modify the risky situations they faced rather than choose personally, at the present time, with the information given. We can infer, then, that when an executive does not like the risky alternatives before him, he may initiate actions to shift responsibility for the decision, to delay, to understand, or to influence the underlying uncertain events.

4. *The executives demonstrated a marked willingness to take risks.* Although most executives tried to modify the risks, their responses also indicated their propensity to choose the risky alternative in three of the four decision situations.

5. *Risk seeking is more common for attitudinally based risk measures than for behaviorally based risk measures.* The risk rating reflects attitude rather than behavior. This measure yielded greater risk seeking than either the memo risk or the risk premium, which reflect behavior. This result is consistent with a cultural bias in favor of taking risks that is revealed more in attitudinally based measures than in behaviorally based measures.

6. *A person's risk propensity derived from different risk measures can be highly similar.* The results showed a strong relationship among response modes for a particular situation. Thus whether the executive exhibited his risk propensity by writing a page-long memo, by checking a position on an 11-point scale, or by specifying a probability equivalence, we observed a consistent tendency.

7. *A person's risk propensity obtained in different situations can be very dissimilar.* We found wide disparities in risk seeking and risk averting over the four decision situations.

8. *Risk seeking is more common for losses; risk averting is more common for gains.* The highest risk seeking occurred for the customer threat. This situation involves the possibility of loss (up to \$7 million per year) but no chance of gain. The lawsuit and the union dispute both

elicited moderate risk seeking. The lawsuit involved only losses (with a maximum possible loss of \$1.6 million) and status quo, while the union dispute had the possibility of gains and losses. For the joint venture we did *not* observe risk seeking. Overall there was a slight inclination toward risk aversion. This situation differs in that there is no chance of loss (the worst that can happen is to receive only a 10% after-tax return).

Hence, overall we found the seemingly paradoxical result that executives took risks when there were possibly large negative payoffs and avoided risks when there was no chance of an absolute loss (from status quo). This result has also been found in studies of Kahneman and Tversky (1979) using monetary gambles. One possible explanation is that if the sure payoff seems quite good (e.g., 14% after-tax return on investment), then people satisfice in situations in which all payoffs are positive. When no payoffs are positive, people are adverse toward accepting a large sure loss (e.g., settling out of court) and choose the risky action because they either underemphasize the magnitude of the largest possible loss or underestimate the probability of this loss. Another explanation for risk seeking over losses but risk aversion over gains is ecological. Over a series of major decisions, the person who settles for sure losses is not likely to be promoted, so we would not observe him in our sample of top executives. We would also not observe the person who takes the risk and loses. Hence, we are most likely to be dealing with people who have experienced relative success in bad situations by taking risks. It would not be surprising that these people are likely to take risks again.

Further evidence of the importance of the gain/loss distinction in risky choice was apparent from two other instruments used with the same executives. One instrument presented the executives with hypothetical investment opportunities in which possible payoffs were characterized by eight parameters of the distribution of returns. A surprisingly large proportion focused on the gains rather than the losses (Bassler et al. 1978). In a follow-up study with a subgroup of the executives, another instrument presented them with *real* lotteries in which they had an opportunity to win or lose more than \$400. There was a lower tendency to seek risks when their own money was at stake (MacCrimmon, Stanbury, and Wehrung 1980).

9. *The Risk In-Basket is a very effective way for studying risk modifications and for assessing risk propensity.* The Risk In-Basket required the subject to assume the role of a hypothetical executive faced with four risky business decisions. The memo response mode provided an open-ended format in which subjects specified a variety of ways in which they would handle the risky situation. The congruence of the memo results with two additional response modes (i.e., a scale rating and a probability equivalence) provided assurance of the validity

of the responses. The coupling of the clear specification of outcomes and probabilities with the flexibility of varied response modes provides a unique instrument for studying risk. Few of the findings in this study could have been determined with previous instruments.

These findings have implications both for research and for practice. First, for theoretical research, the prevalence of attempts to modify risk suggests the desirability of expanding existing theories of risk beyond a narrow focus on choice. We can learn as much, if not more, about risk behavior by studying how decision makers modify the risks they face through collecting information, bargaining, delaying, and delegating as by examining which alternative they choose. Recent models of risk sharing in an agency context are a step in this direction. The dependence of risk propensity on decision context suggests the need to develop theories of risk behavior conditional on characteristics of contexts such as gains or losses, the presence or absence of adversaries, whether the problem was referred by someone else, and so forth.

Second, for empirical research, there need to be more studies focusing on risk modification in a variety of situations. The response modes need to be flexible enough to allow the natural risk modifications to emerge yet structured enough to allow the empirical results to be related back to theory. The connections we have found between risk modifications and risk avoidance need to be investigated more systematically. Despite the significant relationship we found among different measures of risk propensity, subsequent empirical studies should continue the practice of deriving multiple measures from different response modes. One needs to be particularly cautious about attitudinally based measures which may tend to provide a bias toward risk seeking because of the cultural value attributed to people who take risks.

Third, for practice, the Risk In-Basket provides a means for assessing risk propensity that appears to have a stronger validity than previous measures. To the extent that risk propensity is an important characteristic in recruitment, selection, and training, we have a method of assessment that could help in making such decisions. The widespread differences in risk propensity across decision contexts, however, indicate that it is inappropriate to generalize a willingness to take risks from one situation to other situations. Generalizations can be particularly misleading if one situation involves only gains and another situation involves only losses. Knowledge of a person's risk propensities in a variety of situations could help to assure that the person's risk propensity corresponded to the attitude toward risk desired by the firm. By studying how a person modifies the risks he faces, we can better understand how flexible and imaginative he is in arranging a more favorable situation. By using the Risk In-Basket as a microcosm for risky decision making, an executive can compare his risk modifications

with those of other executives to expand his array of risk-handling methods.

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