Available online at www.sciencedirect.com

SCIENCE DIRECT®

Journal of Business Venturing 20 (2005) 47–69

JOURNAL of BUSINESS VENTURING

Missing the boat or sinking the boat: a study of new venture decision making

John W. Mullins[a,*], David Forlani[b,1]

[a]*London Business School, Sussex Place, Regent's Park, London NW1 4SA, United Kingdom*
[b]*College of Business Administration, University of Colorado at Denver, PO Box 173364, Campus Box 165, Denver, CO 80127, USA*

Received 1 January 2002; received in revised form 1 July 2003; accepted 1 August 2003

Abstract

Taking two conceptualizations of risk, Dickson and Giglierano's [J. Mark. 50 (1986) 58] nautical analogy of entrepreneurial risk (sinking vs. missing the boat) to represent the likelihood of loss element of new venture risk, and March and Shapira's [Manage. Sci. 33 (1987) 1404] risk as hazard (boat size) to represent the magnitude of loss element of new venture risk, we investigated how two contextual factors, the suitability of entrepreneurs' skills and their sources of funds, and two individual differences factors, the entrepreneurs' risk propensities and their perceptions of risk, influence their new venture decision making. Metaphorically speaking, we found that most entrepreneurs would rather risk missing than sinking the boat, and that they preferred to pilot bigger craft than smaller ones. Perhaps surprisingly, our sample of highly successful entrepreneurs made relatively risk-averse choices, with 83% choosing either of the two ventures for which the chances for loss were lowest. We also found that the source of new venture funding—the entrepreneur's own money versus that of investors—influenced our subjects' choices between ventures whose chances for loss or gain differed. A similar effect was found for the entrepreneur's risk *propensity*. On the other hand, we found that the risk the entrepreneurs *perceived* in the choice set also influenced choices, but only where the *magnitude* of the new venture's potential gain or loss varied. When viewed in total, our study and results suggest a risk- and reward-based typology of new venture opportunities, one that may provide a conceptual

* Corresponding author. Tel.: +44-207-262-5050; fax: +44-207-723-8534.
E-mail addresses: jmullins@london.edu (J.W. Mullins), dforlani@carbon.cudenver.edu (D. Forlani).
[1] Tel.: +1-303-556-6616; fax: +1-303-556-5899.

doi:10.1016/j.jbusvent.2003.08.001

foundation for future explorations of a variety of questions relevant for entrepreneurs and theorists alike.

Keywords: Risk; Decision making; Risk perception; Risk propensity; Opportunities

1. Executive summary

Despite the central role of risk in entrepreneurial decision making, there has been little empirical study of the various contextual factors that may influence risky new venture decisions. Our experimental study, conducted in a sample of entrepreneurs who lead some of America's fastest growing firms, examined the effects on new venture choices of two such factors, the source of funding for a proposed venture and the suitability of the entrepreneur's skills to the venture, as well as two additional factors, the entrepreneurs' own risk propensities and risk perceptions.

For the contextual factors, the results of our study indicate that the source of the new venture's funding (yours or others') influenced our subjects' choices among ventures that differed in their *likelihood* (or chance) of producing a loss or gain, but had no influence on choices among ventures differing in the *magnitude* of their potential loss or gain. Surprisingly, for the other manipulated factor, the suitability of the entrepreneurs' skills to the proposed venture, there were no significant effects.

We also found significant effects for the individual differences factors studied, the subjects' perceptions of risk and their risk propensities. Both of these factors influenced risky choices, though the nature of these effects differed: risk perceptions influenced choices among ventures differing in *magnitude* of loss or gain, while risk propensity influenced choices among ventures differing in *likelihood* of loss or gain.

Thus, by uncoupling the likelihood and magnitude elements of risk, our study yields new insights into entrepreneurs' new venture decision making. The degree to which investors ask entrepreneurs to invest their own money in a new venture versus having them take stock options, for example, may influence the degree to which such entrepreneurs are willing to take the risks necessary to exploit an opportunity's full potential.

Overall, our subjects showed themselves to be a surprisingly risk-averse lot, especially given their demonstrable success leading high-growth real-world companies, as one third of them chose to fund the least risky venture (out of four) in our study. The venture chosen most often was that with the second lowest level of risk, picked by 49% of our subjects. Thus, less than a fifth of our sample (17%) selected one of the two riskiest ventures.

The results of our study suggest that entrepreneurs may have innate preferences, preferences that transcend simple risk propensity, for the kinds of risk they are willing to accept. On one hand, this is not surprising, as an abundance of prior research has shown that propensity to take risk is situation specific. Day traders may not like skydiving, and skydivers may not wish to become entrepreneurs.

On the other hand, our results suggest that a deeper understanding of risk and its likelihood and magnitude elements may shed new light on how entrepreneurial teams might best be formed to lead a particular venture, given the relative size of its potential gains or losses and the degree of uncertainty entailed in the venture's outcomes. Entrepreneurs may also find this research useful in determining at least some characteristics of ventures for which they are best suited. Similarly, such an understanding may aid investors in deciding which entrepreneurial teams or which ventures they should back.

Our results also suggest that a more detailed, dimension-specific understanding of risk and its elements is required for entrepreneurs themselves and those who invest in them to more fully understand their risk-taking behavior. To this end, we offer a preliminary typology, based on risk and reward, of four types of new venture opportunities that arise from our research and its results. The four types are represented by the four high/low combinations of the two key elements of entrepreneurial risk: the relative *likelihood* (high or low) that gains or losses will ensue from the venture and the anticipated *magnitude* (high or low) of those gains and losses. Future research on these types may provide insights into how new ventures evolve, from an entrepreneurial risk perspective, over their life cycles, especially as technical and market milestones are reached. Since likelihood and magnitude of loss appear to influence risky decisions differently, entrepreneurs and investors should consider aligning the risk profiles of individuals with the nature of the risks attendant in a particular new venture opportunity.

2. Introduction

The rapidly changing competitive landscape in today's markets is forcing both entrepreneurs and established companies to quicken their pace, seeking first-mover advantage with new products or in new markets (Dickson, 1992; Carpenter and Nakamoto, 1989). As the thinking goes, speed is good. Simultaneously, many firms have been restructuring and reengineering in an effort to maintain profit levels (Hammer and Champy, 1993). The interaction of these market and fiscal realities has led both to the creation of new firms and new ventures within existing firms, as well as to a hue and cry for existing businesses to become more "entrepreneurial" (Dess et al., 1997).

However, the road to success for new ventures either inside or outside established firms is a rocky one, as the benefits of first-mover advantage have been called into question (Robinson et al., 1992; Boulding and Christen, 2001) and the odds of failure exceed those for success (U.S. Small Business Association, 2001). Nearly 1 in 10 companies in the United States went out of business in 2000. In a half dozen states, the figure was 60% higher, with one in six going concerns closing their doors. To raise the potential for long-term success, it may be useful to identify the dangers, or risks, entailed in new venture decisions and to develop a deeper understanding of how the nature of such risks, as well as various situational and individual differences factors, influence entrepreneurs' new venture decision making.

In recent years, a growing body of research into how and why entrepreneurs' decisions are made has begun to emerge. Forlani and Mullins (2000) found that risk propensity and risk

perceptions influenced entrepreneurs' choices among a set of hypothetical new ventures, and that a combination of the variability in anticipated outcomes and the magnitude of potential losses, in turn, influenced these perceptions. Two other recent studies also attest to the importance of risk perceptions in new venture decision making. First, a study by Palich and Bagby (1995), examining differences between managers and entrepreneurs, suggests that differences in the risk taking between the two groups are in part a result of differences in how they perceive the world. Second, a study by Simon et al. (2000) provides additional insights into how perceptions of risky decision situations are formed. Simon et al. found that the illusion of control and small numbers biases reduced perceptions of risk, which in turn increased the likelihood of starting a venture.

Collectively, these studies demonstrate the importance of risk and risk perceptions on new venture decision making, but they leave unanswered questions about the effects of other contextual variables (Baird and Thomas, 1985) that may influence risky decisions in other ways. The Forlani and Mullins (2000) study also questions whether the two elements of risk—its variability in outcomes (what we refer to as its likelihood of loss) and the size of a possible loss (what we refer to as its magnitude of loss)—influence risky decisions similarly, or in different ways.

Thus, in this paper, we report the results of two experimental studies that address the following research questions: (a) Why are risky ventures pursued by some entrepreneurs, in some situations, and not by others? (b) What roles, if any, do contextual factors play in entrepreneurs' new venture decisions? and (c) What other factors distinguish among entrepreneurs' willingness to take more or less risk when deciding to enter a new venture? More specifically, our research examines the extent to which entrepreneurs' new venture decision making reflects (1) risk's elements, the likelihood and magnitude of a potential loss, (2) two contextual factors surrounding the market entry decision, the entrepreneur's skill and degree of personal financial exposure, and (3) the entrepreneur's risk-based traits and cognitions, risk propensity and risk perception.

We chose to study these particular contextual and individual differences factors for several reasons. First, the theories that predict the effects of the entrepreneur's skill and financial exposure have not previously been examined in an entrepreneurship setting (Thaler and Johnson, 1990; Heath and Tversky, 1991). Second, both these contextual and individual differences factors are recognized as important to successful entrepreneurial practice (Forlani and Mullins, 2000; Mullins, 2003; Palich and Bagby, 1995; Sahlman, 1997). Finally, none of these factors have been investigated in an entrepreneurial setting that explicitly considers the nature of the risk involved.

Our research questions are important to both entrepreneurship theory and practice. From a theoretical perspective, by integrating perspectives from the market-entry and risk-taking literatures, answering these questions not only offers new understanding of the effects of contextual factors on risky decision making (Baird and Thomas, 1985), it also examines new venture decision making in a unique and potentially revealing way. If new venture decisions are motivated by gain and tempered by risk of loss, then investigating these decisions from an integrative perspective should offer fresh empirical insights in an entrepreneurial setting into the theories of risky choice behavior we examine [Thaler and Johnson's (1990) work on

"house money" and Heath and Tversky's (1991) work on decision maker competence]. Additionally, these insights should provide fertile ground for future research.

For practice, our study is important as it provides entrepreneurs and investors with a new way to conceptualize what are arguably some of the riskiest decisions made in organizations. It offers potential guidance for investors in assessing the appropriateness of entrepreneurs and entrepreneurial teams to particular new venture opportunities. And it provides entrepreneurs a framework for thinking about their own risk propensities and preferences and how these preferences play out in choosing ventures for which they are well suited. Our research addresses these issues by proposing a preliminary typology, based on risk and reward, for classifying new venture opportunities.

To address our research questions, we first define entrepreneurial risk using two conceptualizations of risk, Dickson and Giglierano's (1986) risk as the likelihood of loss, and March and Shapira's (1987) risk as the size of loss a decision can entail, and demonstrate how these conceptualizations parallel risk's likelihood and magnitude of loss elements (Yates and Stone, 1992; Forlani et al., 1995). Next, using a sample of America's most successful entrepreneurs, we experimentally examine whether different new venture decisions are attributable to (a) the sources of funds financing the venture (Thaler and Johnson, 1990; Mullins et al., 1999), (b) the suitability of the entrepreneur's skills to the venture (Heath and Tversky, 1991; Shapira, 1995), (c) the entrepreneur's propensity to take risk (Lopes, 1987; MacCrimmon and Wehrung, 1990), and (d) the entrepreneur's perceptions of risk (Sitkin and Pablo, 1992; Palich and Bagby, 1995). Finally, based on our theoretical formulation and our findings, we set forth our risk- and reward-based typology of entrepreneurial opportunities, one that might provide the basis for future research in this area.

3. Theoretical development

3.1. Defining risk

According to Yates and Stone (1992, p. 4), the risk construct reflects three underlying facets: (a) potential losses, (b) the significance of those losses, and (c) the uncertainty of those losses. In keeping with Yates and Stone's definition of risk, we operationalize risk as multidimensional, involving both the *likelihood* and *magnitude* of below target outcomes which may follow from a given behavior or set of behaviors. What motivates actors to engage in risk taking, of course, is the chance for gain. So, while risk taking involves both the potential for loss and the potential for gain, risk itself, according to Yates and Stone, involves the likelihood of realizing some magnitude of loss. Next, we identify the risk in new venture funding decisions and define entrepreneurial risk in terms of risk's elements.

3.1.1. The likelihood element of risk

Dickson and Giglierano (1986) characterize entrepreneurial risk as either the potential to act too quickly on an unsubstantiated opportunity, thus "sinking the boat," or the potential to

wait too long before acting, thus "missing the boat." They define sinking the boat as the *likelihood* that a new venture will fail to reach satisfactory sales (p. 61), and missing the boat as the *likelihood* that a very attractive opportunity will be overlooked, dismissed, or lost because of competitor preemption or changing markets (p. 62). Here, *likelihood* refers to the chance or probability that a new venture will achieve certain outcomes, such as gains or losses. To paraphrase the Dickson and Giglierano analogy, entrepreneurs often launch their boats into the haze of an uncertain market, hoping to win pioneering advantage (Carpenter and Nakamoto, 1989; Kerin et al., 1992). If the market either fails to congeal or develops around a different solution, then the entrepreneur has sunk the boat. Conversely, another entrepreneur may wait for the haze to lift, hoping for a clearer view of market needs, but in doing so may miss the boat or wind up occupying a follower position after a more risk-seeking competitor has made the first move. While risk, by definition, entails some possibility of experiencing a loss of some magnitude (Yates and Stone, 1992), the Dickson and Giglierano (1986) view of entrepreneurial risk emphasizes the *likelihood* of realizing an undesirable outcome from a particular new venture decision, thereby reflecting the uncertainty element of Yates and Stone's definition.

3.1.2. The magnitude element of risk

A leading managerial perspective of risk-taking behavior (March and Shapira, 1987; Shapira, 1995) contends that managers do not see risk as a probability distribution, but as the size of loss that a decision entails; if things go wrong, how much can we lose? "A risky choice is one that contains a threat of a very poor outcome" (March and Shapira, 1987, p. 1407). This perspective is quite different from that of Dickson and Giglierano (1986), as the manager is not concerned with the likelihood of failure here, but with the *magnitude* of its worst possible outcome, or in nautical terms, the size of the boat that could be sunk or missed. To continue the nautical analogy, one entrepreneur may decide to launch a large boat, one with a heavy commitment of capital assets (Carpenter, 1987) and/or market entry expenses (Green et al., 1995), hoping to secure a share-leading position. Another entrepreneur may launch a small boat with minimal resources, being happy at the outset with securing a toehold in the market. These entrepreneurs face quite different risks in terms of how much they can lose, regardless of timing considerations. Thus, the hazard perspective of risk (March and Shapira, 1987) reflects the magnitude, or significance, of losses that may result from a particular new venture decision (Yates and Stone, 1992).

3.1.3. Entrepreneurial risk

Taken together, the likelihood and magnitude elements of risk comprise all three facets of Yates and Stone's (1992) definition of risk. Thus, for new venture decision making, these two elements, the *likelihood* of loss (sinking or missing the boat) and the *magnitude* of loss (the size of the boat sunk or missed) capture the essence of entrepreneurial risk.

Next we consider the two contextual and two individual factors discussed earlier and we develop predictions that specify under what conditions, and for what sorts of entrepreneurs, riskier or less risky choices will be made.

3.2. Contextual factors and risky choices

3.2.1. The influence of sources of funds on new venture choices

Research in behavioral decision theory suggests that when gambling, individuals who win early tend to become more risk seeking with later bets (Thaler and Johnson, 1990). Thaler and Johnson (1990) label this finding the "house money effect," which simply suggests that individuals are more willing to take risk when the funds they expose to loss are perceived as belonging to someone else. Unfortunately, no research has shown whether this effect applies to the likelihood element of risk (placing bets in riskier games, i.e., those with less certain outcomes), or to its magnitude element (placing larger bets).

Considered from an entrepreneurial perspective, the most sought after prize, pioneering advantage, is typically realized only by the first firm to market (Golder and Tellis, 1993). The pioneer's advantage may include setting the standards that consumers will demand and that future entrants must exceed, but it also entails significant risk. For instance, the market may not respond to the innovation as expected (Dickson and Giglierano, 1986), as reflected in the chances for an unacceptable outcome, or costs may exceed revenues (Boulding and Christen, 2001). These uncertainties clearly reflect the likelihood of loss element of risk.

Since pioneering advantage is the coveted prize, it seems reasonable that given the opportunity to pursue an opportunity with other people's money (i.e., the house's money) that risk taking will increase along risk's likelihood element. Therefore, we expect that entrepreneurs playing with other people's money (vs. their own) will be more likely to choose ventures having a higher (vs. lower) likelihood of loss and gain (holding magnitude of loss constant). Thus:

H1: When making choices among new venture opportunities of equal expected value that differ only as to their *likelihood* of not meeting a targeted level of return, entrepreneurs *risking outside investors' money* will select riskier ventures than those *risking their own money.*

3.2.2. The influence of the suitability of the entrepreneur's skills on new venture choices

The competency hypothesis advanced by Heath and Tversky (1991) suggests that those who are more skilled at an activity are likely to take greater risks. This view is consistent with attribution theory (Weiner, 1985), which suggests that challenging behaviors may be repeated when prior outcomes are attributed to internal-controllable factors (such as skill) versus external-uncontrollable factors (such as luck). Mullins et al. (1999) tested this prediction in an organizational setting and found that subjects were willing to make riskier choices when the outcomes from their prior choices were attributed to their own efforts and skill versus competitive factors that were external and uncontrollable.

Entrepreneurs who launch bigger boats (i.e., ventures with greater magnitudes of potential gain and loss) may be willing to do so because their skills and prior history give them confidence that they can succeed (Krueger and Dickson, 1994). This conclusion is supported by Shapira (1995), who suggests that good managers who possess the skills

necessary to minimize the downside hazard associated with business decisions (i.e., magnitude of loss) see risk-taking as part of their jobs. The above theories and findings on the relationship between skill and risky decision making suggest that the increased risk taking that results from higher levels of skill will influence differences in the *magnitude* element of the risks taken, wherein entrepreneurs place bigger bets on ventures that utilize their skills. Thus, we hypothesize:

H2: When making a choice among new venture opportunities of equal expected value that differ only as to the *magnitude* of their potential for above and below target returns, entrepreneurs whose *skills are well suited to the venture's needs* will be more likely to select one with *larger anticipated losses and gains* than will entrepreneurs whose skills are not well suited.

3.3. Risk perceptions, risk propensity, and risky choices

Given risk's salience in entrepreneurial endeavors, one objective of our study is to gain a deeper understanding of entrepreneurs who take significant risks, as well as of those who avoid them. Within the theoretical framework shaping our study, significant risks (taken, of course, in pursuit of hoped-for gains) include decisions to undertake new ventures having high levels of either likelihood of loss or magnitude of loss, or both. Thus, to gain a better understanding of who these people are, we now develop hypotheses using two factors shown to influence risky choice decisions, the decisions maker's risk propensities and risk perceptions, to predict choices among risky new ventures.

3.3.1. The influence of risk propensity on new venture choices

Following Sitkin and Pablo (1992) and MacCrimmon and Wehrung (1990), we define *risk propensity* as an individual's general tendency toward either taking or avoiding risk within a particular kind of decision context. This definition reflects the natural disposition of decision makers for potential or security in their risk-taking behaviors and identifies a decision-maker trait that is independent from any particular decision context. For example, some decision makers enjoy taking financial risks, living in the hope of realizing upside gains. Day traders are but one example. Others (who may keep their money in government securities or under their mattresses) dread financial risk taking, as they fear realizing downside losses (Lopes, 1987). The risk propensity construct captures this innate disposition.

Viewed from Dickson and Giglierano's (1986) nautical perspective, we argue that the difference between launching a *high likelihood* of loss new venture versus a *low likelihood* of loss venture reflects one's *need to not miss* the boat versus one's *need to not sink* the boat. This distinction seems to reflect the goal the decision maker is motivated to achieve. Krueger and Dickson (1994) provide support for this observation. They suggest that risk-prone entrepreneurs subjectively value upside and downside *probabilities* differently than do those entrepreneurs who are less risk prone. Entrepreneurs with high propensities for taking risk give relatively less weight to the chance of

realizing a loss and relatively more weight to the possibility of gains. That is, an overweighing of uncertain gains compared to uncertain losses motivates risk-prone entrepreneurs to make riskier choices than their risk-averse counterparts. We limit this prediction to choices among new ventures with *high magnitudes* of loss, following an argument of Krueger and Dickson, as they suggest that larger potential losses leverage the bias, making it easier to observe.

This line of reasoning suggests that what distinguishes entrepreneurs who take greater risk from those who embrace opportunities with more certain outcomes is dispositional, being more closely linked to risk propensity, which reflects who they are, than to a factor like risk perception, which reflects what they see. Thus, we hypothesize:

H3: Entrepreneurs who select new ventures *high in both* the likelihood and magnitude elements of risk will be characterized by *higher levels of risk propensity*, compared to entrepreneurs who select new ventures that are *high* in the magnitude element of risk, but *low* in the likelihood element of risk.

3.3.2. The influence of risk perceptions on new venture choices

Sitkin and Pablo (1992) define *risk perception* as a decision maker's assessment of the risk inherent in a particular situation. This suggests that individuals may vary concerning the degree of risk they perceive in a set of decision alternatives and, based on such perceptual differences, may differ in their decisions. Thus, to the extent that a set of decision alternatives is viewed as less risky by one observer than by another, the observer who views such a set as less risky may choose from the set a relatively riskier alternative. This prediction follows from the work of Sitkin and Weingart (1995) who found a significant, negative correlation between subjects' risky choices and their perceptions of risk.

In their study of executives' views on risk taking, March and Shapira (1987) report that executives see the need for, and claim to regularly engage in, risk taking, where risk is characterized as magnitude of loss, or hazard. However, the managers they studied tended to reject out of hand any decision alternatives they viewed as having high likelihood of loss, because the managers felt they lacked adequate control over future outcomes. This reasoning suggests that to examine the hazard perspective of risk, we study choices among *low likelihood* of loss new ventures. It also raises the question of who is likely to *see less risk* in a set of investment alternatives?

A possible answer is suggested by a study by Palich and Bagby (1995) reporting that entrepreneurs, compared to managers, are predisposed to cognitively categorize business situations more positively, tending, for example, to see opportunity where others see little potential. Palich and Bagby's findings suggest that some differences in risk-taking behavior between two actors are likely the result of the two actors simply seeing the world differently. Such perceptual differences may drive choices among ventures differing in their magnitudes of loss. Given a decision to launch one's boat later, thereby mitigating likelihood of loss, entrepreneurs who choose to launch bigger, versus smaller,

boats may do so because they perceive less of the hazard and more of the potential inherent in their choices. Thus:

H4: Entrepreneurs who select new ventures *low in both* the likelihood and magnitude elements of risk will be characterized by *perceptions of more overall risk* in the choice set, compared to entrepreneurs who select *low*-likelihood, *high*-magnitude new ventures.

4. Method

To test our hypotheses we conducted two experimental studies. The measures of the subjects' new venture choices for both studies were the same, but unique to the first study was a 2×2 between-subjects experiment where sources of funds for the venture and suitability of the entrepreneur's skill were manipulated. These data were used to test the first two hypotheses while the combined data set from both studies was used to examine the last two hypotheses. We begin this section by describing the sample and the general experimental procedure. Next, we describe the manipulated factors, the dependent measure, and the other measured variables.

4.1. Sample

Given our study's focus on the role of risk in new venture decision making, we sought a sample of entrepreneurs with proven expertise (Sarasvathy, 2001), as opposed to nascent entrepreneurs starting either their first, or perhaps very small, new ventures. Since such entrepreneurs would have had direct experience in facing entrepreneurial risk and had dealt with it successfully, our results might, within the limitations of the study, be viewed as having some prescriptive merit. The sample we chose consists of 75 CEOs of firms listed on tabulations of the fastest growing public companies in the United States, published by *INC*, *Fortune*, and *Business Week* magazines (332 firms for the first study; 208 for the second).[2] These experienced entrepreneurs had founded from 1 to 15 firms (mean 3.4 firms) and ranged from 28 to 66 years of age (mean 47.2). Their current firms ranged in size from 6 to 10,500 employees (mean 1172), and $0.4 million to $1.2 billion in sales (mean $157.7 million); 41.8% are engaged in manufacturing and 58.2% are in service industries.

We contacted the CEO's of these firms by fax to request their participation in the research. The 208 subjects who agreed to participate across the two studies (39% of those originally contacted, after three faxed requests) were then mailed the study's instrument, and asked to return it via U.S. mail, to ensure confidentiality. Ninety-one (43%) of the instruments were returned within 5 weeks after two faxed reminders; 16 instruments were discarded as

[2] These lists are the *INC* 100 Fastest Growing Small Public Companies, *Fortune*'s Top 100 Fastest-Growing American Companies, and *Business Week*'s 100 Hot Growth Companies published in 1994 and 1996. There was considerable duplication across these lists.

unusable, leaving a remaining pool of 75 subjects (38 for the first study and 37 for the second).

4.2. Procedure and research design

As previously stated, our research design is a hybrid in which H1 and H2 are tested with data from the first study, to examine the effects of our two (experimentally manipulated) contextual factors, and H3 and H4 are tested with data combined from both studies, to examine the effects of the two (measured) individual differences factors. The general scenario used in both studies presented subjects with a situation in which they were asked to imagine that they were about to undertake another new venture. They were given the descriptions of four hypothetical new ventures and their anticipated outcomes (Appendix A) and told that they would be asked to choose one of four ventures, all of which were in the same industry, required similar and manageable levels of start-up capital, and met the entrepreneur's targets for return on investment (ROI). The ventures were rotated to eliminate possible order effects.

The individual venture descriptions were repeated, one per page, on the next four pages, along with instructions for responding to the perceived risk measure (see Appendix B) which followed each project's description. Next, subjects in the first study were asked to imagine themselves in one of four situations. The situations contained the two manipulated factors, the source of funds for the venture and the suitability of the entrepreneur's skills to the venture, each manipulated at two levels. Finally, subjects in both studies were asked to choose one of the four new ventures.

In keeping with the theoretical perspective associated with the house money effect (Thaler and Johnson, 1990), the source of funds manipulation was intended to have subjects believe that the new venture they were about to choose would be funded either with their own money or funds raised from outside investors.[3] The actual manipulation was:

> *Their money/(Others' money): Since/(Even though) you have sufficient cash to fund several such ventures, equity capital for the new venture you choose will come almost entirely from your own personal funds/(other people's money). Thus, the funds you risk in pursuing one of these ventures are/(are not) your own.*

Similarly, following the theoretical perspective suggested by the "competency hypothesis" (Heath and Tversky, 1991), the skill manipulation was intended to have subjects believe that their skills arising from their prior experience were either well suited or poorly suited to the needs of the new venture. To make the operationalization believable, we did not impute or detract from the subjects' real skills; instead, we manipulated the

[3] We thank an anonymous reviewer for pointing out that this manipulation does not distinguish between those who *must use* or simply *choose to use* other people's money. Future research is needed to shed further light on any possible differences in effects under these different conditions.

stated suitability of their skills to the proposed venture. We did this by making the market in which the new venture would be launched familiar or unfamiliar to them. The actual manipulation was:

> *Well-suited skills/(Poorly suited skills): The four ventures all serve the same/(a different) target market as/(than) that in which you have experienced success before. Thus your market skills and relationships are well/(poorly) suited to any of the four new ventures. Because of your significant/(lack of) competence in the market to be served by any of the new ventures, you will administer the sales function yourself/(need to outsource the administration of the sales function).*

Immediately following the manipulations, subjects were asked to choose one of the four new ventures and to provide information on the manipulation's effectiveness. The remaining procedures were the same for both studies and included responding to the risk propensity measure (see Appendix C) and providing demographic information about themselves and their firms.

4.3. Measured variables

4.3.1. New venture choice:

The dependent measure of new venture choice is based on a 2×2 within-subjects experimental design where likelihood and magnitude of loss are each manipulated at two levels to reflect the outcomes of the four prospective new ventures. All four ventures have equal expected values, described as meeting the entrepreneur's requirements for ROI for new ventures. Two of the ventures have more variable outcomes (a 40% chance of meeting target ROI with a 30% chance of being over target and a 30% chance of being under target vs. an 80% chance of meeting target ROI with a 10% chance of being over target and a 10% chance of being under target). Two of the ventures have greater magnitudes of loss and gain (possible outcomes $25 million over or under target vs. $5 million over or under target). Thus, while the principal focus of our study is on the risk of loss in new venture decisions, our research design asks subjects to weigh the potential for losses against the possibility of gains, just as they would in their everyday decision making.

4.3.2. Perceived risk

The level of risk perceived in each of the four new ventures was captured with a three-item, seven-level semantic differential scale (Appendix B). The reliability of this measure was found acceptable, with a coefficient alpha of .96 (Nunnally, 1978). Additionally, examination of the means and variances of the risk the subjects perceived in each new venture suggests that the four ventures comprise an approximately interval-level measure of entrepreneurial risk. This is important as it allows us to use this measure as the dependent variable in a regression analysis when examining H3 and H4. As Table 1 shows, Venture White was perceived as the least risky venture, followed by Venture Purple. Venture Yellow was the second most risky venture and Venture Green was perceived as the riskiest new venture alternative.

Table 1
Scale of new venture risk

New ventures	Perceived risk means	Standard deviations
High likelihood, high magnitude (Green)	5.6	1.22
High likelihood, low magnitude (Yellow)	4.6	1.44
Low likelihood, high magnitude (Purple)	3.2	1.35
Low likelihood, low magnitude (White)	2.0	0.96

All pairs of means are significantly different (Tukey HSD test) at the .01 level.

4.3.3. Risk propensity

Risk propensity was operationalized using an adaptation of the Risk Style Scale (Schneider and Lopes, 1986), as shown in Appendix C. We chose this measure because it deals with personal propensities toward financial risk taking (as opposed to other kinds of risk, such as those entailed in sky diving) and because of its efficacy in assessing the construct of interest (Schneider and Lopes, 1986).[4]

4.3.4. Prior year's sales

Finally, we included one control variable, last year's sales of the entrepreneur's current business, measured with a single open-ended item, in our tests of H3 and H4. Since our subject entrepreneurs run businesses with significantly different sales volumes, ranging from less than one-half million dollars to over a billion dollars, we reasoned that a $5 million dollar loss to a small business could be more inhibitory to risk taking than a $25 million loss to a very large business, and decided to apply this statistical control.

5. Results and discussion

5.1. Manipulation checks

The effectiveness of the source of funds and suitability of skill manipulations was assessed by comparing the mean scores on the manipulation check items (each a 7-point scale) across the two levels of each experimental condition. As shown in Table 2, both manipulations were effective (i.e., the treatment means spanned the midpoints of the scales and were significantly different).

5.2. Hypothesis tests

The first two hypotheses consider the effect of situational factors on entrepreneurs' new venture choices. Since their dependent measures are dichotomous and their independent

[4] Each item in this five-item scale asks respondents to choose between two options, one a sure gain and the other a probabilistic gain having the same expected value. The probabilistic items indicate a propensity toward risk taking. These choices are summed over the five items to indicate each subject's risk propensity.

Table 2
Manipulation check results

Independent variable	Manipulation check means[a]	*P* value
Source of funds		< .001
Yours	2.65	
Others	5.35	
Skills match		< .001
Strong	1.60	
Poor	5.09	

[a] Mean values reflect a 7-point scale, with 4 as the midpoint.

variables categorical, we examined H1 and H2 by observing choice patterns across levels of the manipulated factors. H3 and H4 also specify a dichotomous dependent variable, but include continuous independent variables, and are examined with logistic regressions.

5.3. Contextual influences on risky choices

H1 predicts that entrepreneurs will chose new ventures that have higher likelihood of loss when the venture is funded with other people's money, versus their own money. This hypothesis was supported, as the pattern of responses was as predicted (see Table 3) and significantly different than chance ($\chi^2_{(1)} = 4.38$, $P < .05$).[5] The result for H1 indicates that the use of "other people's money" can make entrepreneurs more likely to choose ventures where outcomes are uncertain. On one hand, investors should be wary and should—as some do—require that entrepreneurs put their own funds at risk to ensure that the entrepreneur is not simply gambling with someone else's money. On the other hand, for truly innovative new ventures such a requirement may inhibit the entrepreneur's risk-taking behavior and may thereby limit the ability of the venture to reach its full potential.

H2 predicts that, if an entrepreneur's skills are well suited to the market's needs, the entrepreneur will select ventures having relatively greater magnitudes of gain and loss. H2 was not supported, as the pattern of responses (see Table 4) indicates that the results are not significantly different than chance ($\chi^2_{(1)} = 0.63$, $P = .43$)[6]. The result for H2 may reflect the fact that most of the CEOs in our sample probably do not directly administer the sales function in their firms and may have comfort in hiring others to perform such essential tasks, making the suitability of their own skills unimportant. If this is why H2 was not supported, it suggests a boundary condition for the competency hypothesis (Heath and Tversky, 1991), namely, that the relationship between skill and risk taking operates at the individual level and may not

[5] While theory predicted that the effect of the source of financing would be found for ventures differing in likelihood of loss, we also tested to see if the effect was present for ventures differing in magnitude of loss. We found that it was not ($\chi^2_{(1)} = 1.05$, $P = .31$). This result lends additional support to the element-specific view of risk examined in this study.

[6] While theory predicted that the effect of skills would be found for ventures differing in magnitude of loss, we also tested to see if the effect was present for ventures differing in likelihood of loss. It was not ($\chi^2_{(1)} = 0.70$, $P = .79$).

Table 3
New venture choice frequencies for source of funds manipulation

Likelihood of loss	Source of funds		
	Others	Yours	
Low	13	18	31
High	6	1	7
	19	19	

The relationship between these factors is significant ($\chi^2_{(1)} = 4.38$, $P = .036$).

transfer to the organizational level of analysis. Thus, for choices among new ventures that differ in their potential for upside gain and downside loss, the skills of the entrepreneurs may not influence their risk-taking behavior unless they expect to directly apply them.

5.3.1. Risk perceptions, risk propensity, and risky choices

H3 states that risk propensity will distinguish between the 10 entrepreneurs who chose the most risky *high*-likelihood, high-magnitude venture (Venture Green) and the 37 who choose the less (but still) risky low-likelihood, high-magnitude venture (Venture Purple). This hypothesis was supported, as indicated by the results of the logistic regression. Those entrepreneurs willing to tolerate a greater likelihood of loss, when magnitude of loss is also high, are characterized by higher risk-taking propensities (beta=.62, standard error .29, $P < .05$). The overall amount of risk the entrepreneurs *perceived* in the set of decision alternatives was of no help in predicting which new venture they selected (beta=.42, standard error .52, $P = .41$). The results for H3 and this post hoc test suggest that, as theorized, it is risk *propensity*, but not risk *perceptions*, influencing these choices.

For H4, which states that risk *perceptions* will distinguish between the 25 entrepreneurs who chose the somewhat risky low-likelihood, *high*-magnitude venture (Venture Purple) from the 37 who chose the least risky low-likelihood, *low*-magnitude venture (Venture White), the results were also as predicted, as indicated by the results of the logistic regression. Those entrepreneurs able to tolerate larger magnitudes of potential loss, when likelihood of loss is low, perceived less overall decision risk than did those selecting the least risky new venture (beta = − .66, standard error .31, $P < .05$). Additionally, we found the decision-makers' propensity to take risk of no help in predicting which new venture they selected (beta=.06, standard error .20, $P = .77$). The results for H4 and this post hoc test suggest that, as theorized, it is risk *perceptions*, not risk *propensity*, influencing these choices.

Table 4
New venture choice frequencies for suitability of skills manipulation

Magnitude of loss	Suitability of skills		
	Poor	Strong	
Low	8	5	13
High	12	13	25
	20	18	

The relationship between these factors is *not* significant ($\chi^2_{(1)} = 0.63$, $P = .428$).

Table 5
Overall new venture choice frequencies

Magnitude of loss	Likelihood of loss		
	High	Low	
High	10	37	47
Low	3	25	28
	13	62	

Taken together,[7] the results of H3 and H4 offer new insights into differences among entrepreneurs and the new venture decisions they make, showing that the reasons why certain entrepreneurs choose to pursue particular ventures are linked, in ways nor previously understood, to their individual traits and cognitions. Those who are naturally more risk averse will prefer to pursue new ventures having fairly certain outcomes, as measured by the probability of achieving a gain or loss. Those who *see* less risk are more likely to pursue higher stakes ventures with more to gain or lose. The reader should note, however, that the findings for H3 and H4 should be generalized only to the kinds of contexts in which these hypotheses were tested: contexts having high *magnitude* of potential gain or loss for H3 and those having low *likelihood* of outcomes above or below target for H4.

5.4. Why do entrepreneurs choose the ventures they choose?

We began our investigation into the relationship between entrepreneurial risk and new venture decision making by considering two theories of risk: one, not yet empirically tested, which reflects the likelihood of loss element of new venture risk (Dickson and Giglierano, 1986); the other reflects the magnitude of loss element of new venture risk (March and Shapira, 1987; Shapira, 1995). We drew the sample for our study from a population of America's most successful entrepreneurs. Each was CEO of one of the fastest growing companies in the United States. In spite of the business success they enjoy in common, their choices of which venture to pursue in our study differed.

Overall, our subjects were a, perhaps surprisingly, risk-averse lot, as 83% of them chose one of the two ventures (White and Purple) judged as least risky (see Tables 1 and 5). On the other hand, all but 25 subjects (33% of the sample) chose ventures *other than* the least risky Venture White, indicating that taking moderate levels of risk was quite acceptable. At first glance, one might find it surprising that a sample of America's most successful entrepreneurs would evidence such tolerance for forgoing uncertain but possibly significant gains, and that a significant percentage of them recoil from even moderately risky opportunities. However, when viewed in the light of either economic utility theory (Von Neumann and Morgenstern, 1944) or prospect theory (Kahneman and Tversky, 1979), both of which predict risk-averse behavior among decision makers who have experienced gains (such as the successful

[7] The control variable, prior year's sales in the subjects' real companies, had no significant effect in our tests of H3 and H4, P=.14 and P=.75, respectively.

entrepreneurs in our study), we see that these entrepreneurs are indeed a risk-seeking lot, as two thirds of them chose ventures *other than* the least risky one.

Applied to our first research question, these findings indicate that the *nature* of the risk inherent in a new venture opportunity, as much as its *level*, influences entrepreneurs' choice behaviors. The element of risk with the most negative effect on risk taking was likelihood of loss, as only 17% of our sample chose either of the ventures (Ventures Green and Yellow) having the higher level of likelihood of loss (see Table 5). This finding is consistent with the findings from the manager-dominated samples of Shapira (1995). In explaining why most managers would avoid pioneering decisions, Shapira suggests that the social or organizational penalties for being "myopic" are far less severe than are those for being a "loose cannon." This tendency may reflect the explicit loss experienced when a boat is sunk compared to the less quantifiable opportunity cost associated with one that is missed. Apparently, the adage that pioneers are the ones with arrows in their backs is one that many successful entrepreneurs heed. Yet, when they decide to launch, our subjects prefer to pilot bigger boats, at the risk of greater possible losses, as 63% chose one of the two high *magnitude* of loss new ventures.

Our second research question asked how contextual factors might influence entrepreneurs' new venture choices. Our results indicate that where the new venture funding comes from—other people's money or the entrepreneur's money—is one factor that drives the riskiness of such choices, but only along the likelihood of loss element of risk. The other factor we examined, the suitability of the entrepreneur's own skills to the venture, had no influence on the riskiness of entrepreneurs new venture choices. This finding of no effect is interesting as it suggests that successful entrepreneurs may be comfortable delegating or outsourcing responsibility for marketing, a function that is generally critical to a new venture's success.

Finally, we asked what individual factors influence entrepreneurs' new venture choices. While previous research has demonstrated that the entrepreneur's risk-based traits and cognitions can influence such decisions (Forlani and Mullins, 2000; Simon et al., 2000), this study shows that these relationships are peculiar to specific elements of risk. Specifically, in high-risk decision contexts, risk propensity influences decisions along risk's likelihood of loss element, and in lower risk environments, perceptions of risk influence decisions along risk's magnitude of loss element. Such understanding may aid investors in deciding which entrepreneurs or which ventures they will back. Relatively simple tests could be devised to assess candidates' risk propensities or the degree of risk they perceive in the particular decision context at hand. Entrepreneurs, too, may find this research useful in determining at least some characteristics of ventures for which they are best suited.

Taken a step further, our results also suggest that entrepreneurs may have innate preferences—preferences that transcend simple risk propensity—for the kinds of risk they are willing to accept. On one hand, this is not surprising, as an abundance of prior research has shown that propensity to take risk is situation specific (Bromiley and Curley, 1992). Day traders may not like sky diving, and skydivers may not wish to become entrepreneurs. On the other hand, our results indicate that a deeper understanding of risk and its likelihood and

magnitude elements may shed new light on entrepreneurial behavior, perhaps including how entrepreneurial teams might best be formed to lead a particular venture, given the relative size of its potential gains or losses and the degree of uncertainty entailed in the venture's outcomes. For example, for early-stage high-technology opportunities where the magnitude of the prospective gain or loss is high but outcomes are highly uncertain, entrepreneurial teams should probably include some key members whose propensity for risk is relatively high, or the opportunity may not be vigorously pursued.

6. Limitations

Our study, like most experimental studies in business settings, suffers from several limitations. First, entrepreneurs in real situations may not behave as did our subjects in the hypothetical situations in which they were placed in our study. For instance, we asked subjects to choose among a set of four new venture alternatives whose investments and expected values were all equal. Such precise equality of investments and expected values across proposed ventures is unlikely in real situations. However, given both the early stage of research in this arena and our interest in testing theories, some of which have undergone little empirical scrutiny, we felt the sacrifice of some realism for increased control was an acceptable tradeoff.

Second is the use of a measure of risk propensity borrowed from another literature, a measure that may not adequately capture the propensity of entrepreneurs to take risks in new venture situations. Bromiley and Curley (1992) argue that risk propensities are to some degree situation specific, and that measures from one situation may not work well in other situations.

Third, our operationalizing the suitability of skill construct at the organizational level may account for the nonsignificant finding of H2. McNamara and Bromiley (1999) suggest that while risk is borne by the organization, risks are taken by managers and that behavior should be considered at the individual level. Nevertheless, the nonsignificant finding may prove interesting because of its implications for skill's locus in a variety of risk-charged decisions. If skilled decision makers plan not to directly administer the function they are skilled in and will hire or outsource to obtain the necessary talent, then possession or lack thereof of that skill may not influence their risk taking.

Fourth, many of the entrepreneurs in our study are now likely much wealthier, with much more to lose, than when they first started. These CEOs, having achieved some of their economic and personal objectives, may now be less aggressive in their need or desire to undertake riskier endeavors. Indeed, it may be that the subjects who chose the low-risk Venture White were those who have mellowed in their risk-taking propensities, paralleling the inverse relationship between job tenure and risk taking found by MacCrimmon and Wehrung (1990). If our sample had been limited to CEOs just establishing an early-stage first venture, we may have seen a pattern of riskier choices.

Finally, we restricted our examination to a limited set of factors. Other, potentially important contextual factors—such as degree of equity ownership or operational control,

other incentives, or other contextual factors proposed by Baird and Thomas (1985)—were not examined in our study. Future research is needed to explore these and other likely influences on new venture decision making.

7. Future research and conclusions

The results of this research suggest that entrepreneurs and investors might find it worthwhile to examine four types of risk and reward profiles that characterize prospective new venture opportunities. The four types are represented by the four high/low combinations of the two key elements of entrepreneurial risk: the relative *likelihood* (high or low) that gains or losses will ensue from the venture and the anticipated *magnitude* (high or low) of those gains and losses. We organize the four types into a preliminary typology as shown in Table 6.

The typology and the results of our study raise several interesting questions for further research. First, the subjects in our study were least likely to choose the high-likelihood/low-magnitude venture (the one corresponding to Type Yellow in the typology), although they perceived the high-likelihood/high-magnitude venture (the one corresponding to Type Green) as the most risky. Why? While we collected no verbal protocols or other process measures that could answer this question, it appears that entrepreneurs may require a large reward for assuming a greater chance for below target returns.

Second, the typology in Table 6 also raises questions about the life cycle of new venture opportunities, questions that go beyond the start-up scenarios we examined here. Do most early-stage opportunities begin in the upper left-hand cell, then move to the right or downward? In later stages, do they move to the lower right-hand cell? In other words, what happens to the nature and level of risk as time passes? Does it continually decrease, or does it decrease early on and rise again as a competitor or substitute threatens the innovation? Further, what is the interplay between risk's elements over time? Changing our focus from ventures to markets raises similar questions. What sorts of risk do pioneers and later entrants face as markets evolve? Are those who create new markets faced with risks like those that characterize Type Yellow or Green opportunities in our typology? What sorts of risks do fast followers or later entrants face in terms of risk's elements, and how do such risks influence their market entry decisions?

Table 6
A risk/reward typology of new venture opportunities

Magnitude of loss or gain	Likelihood of loss or gain	
	High	Low
High	*Type Green*: big boats with fairly uncertain outcomes	*Type Purple*: big boats with quite certain outcomes
Low	*Type Yellow*: small boats with fairly uncertain outcomes	*Type White*: small boats with quite certain outcomes

Our typology also raises a question about the role that the attainment of technology or market milestones plays in transforming a new venture opportunity from one type into another. Which kinds of milestones tend to move an opportunity in which direction? The typology may lead to new thinking about how new ventures and new markets develop over their life cycles, and how entrepreneurs can more effectively manage the associated risks. All these questions call for further study in this emerging research arena.

Future research is also needed to examine a number of other questions not addressed by our study. For example, what contextual factors, other than sources of funds and the suitability of their skills, influence the new venture choices of entrepreneurs? Factors such as the entrepreneur's degree of equity ownership or operational control or other incentives, to mention just a few, might be expected to influence such decisions. Baird and Thomas (1985) offer a list of such potential factors whose influences might fruitfully be investigated.

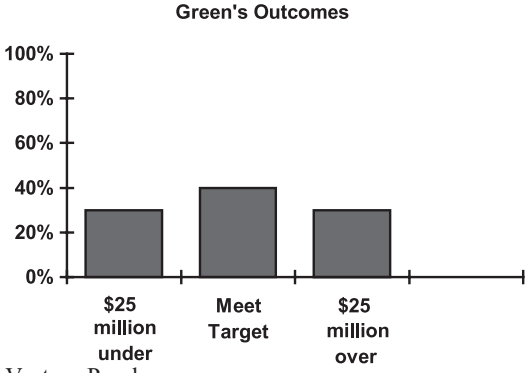
Additionally, do risky strategic decisions—such as those involving entry into new markets or the development of new products—differ for managers in large, established firms compared to entrepreneurs who lead new, smaller firms? For example, contrast our finding for H1 that entrepreneurs are more likely to take more risk when using other people's money with Shapira's (1995) interviews of managers who shun risky opportunities with highly variable outcomes. It seems unlikely that Shapira's managers would ever choose to be pioneering risk takers, even though the funds they would risk are typically not their own. This contrast implies possibly significant differences in the decisions of managers and entrepreneurs about when and how to enter new markets, as well as differences in the motives that underlie these decisions. An emerging literature on the effects of order of entry on long-term market success suggests that leaders of firms having strong brand names or distribution channels and firms that are good imitators can afford to be less concerned with missing the boat (Golder and Tellis, 1993; Szymanski et al., 1995; Green et al., 1995; Robinson et al., 1992). This stream of research suggests that the possession of significant market- or firm-based skills and capabilities can mitigate the need to assume the higher levels of risk often associated with a pioneering market entry strategy. Contrasts between the findings of this firm-level research and our individual-level study merit future empirical examination.

In conclusion, by integrating both entrepreneurial (Dickson and Giglierano, 1986) and managerial perspectives of risk (March and Shapira, 1987), our study revealed new insights into entrepreneurial risk and its behavioral consequences. By considering the source of a new venture's funds (Thaler and Johnson, 1990) we identified a condition under which entrepreneurs are more likely to take greater risks. And, by examining the effects of their risk-based traits and cognitions (Lopes, 1987; Sitkin and Pablo, 1992) we found additional explanations for why entrepreneurs make the decisions they do. These decisions include those about the size of the metaphorical boats that individual entrepreneurs wish to pilot and the choices they make that may, if things do not go well, result in sinking or missing the boat. In so doing, we have shown that a marriage of theories from behavioral decision research with those concerning entrepreneurial risk can provide a theoretical and methodological foundation for addressing important new venture decision-making issues, the understanding of which is crucial to a more complete understanding of entrepreneurial behavior.

Appendix A. New venture choice measure

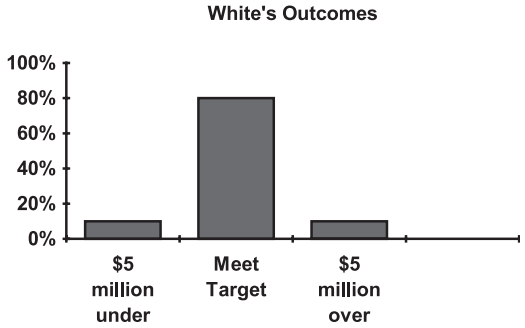
Venture Green

There is a 30% chance of being under t arget by $25 million, a 40% chance of meeting target ROI and a 30% chance of going over target by $25 million. Graphically the distribution appears as:



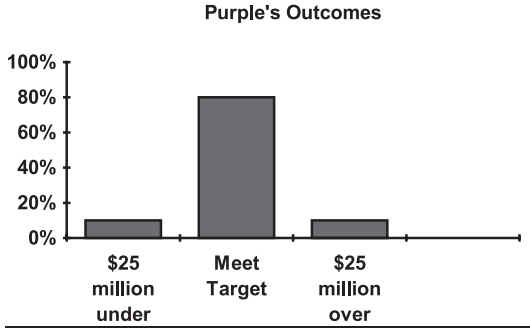
Venture White

There is a 10% chance of being under target by $5 million, an 80% chance of meeting target ROI and a 10% chance of going over target by $5 million. Graphically the distribution appears as:



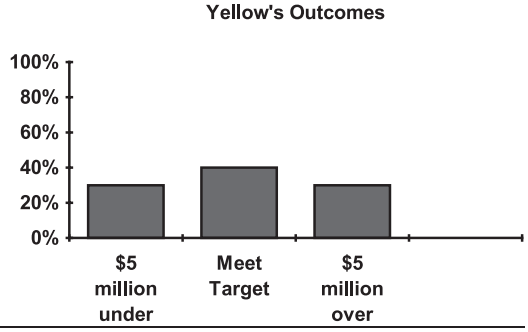
Venture Purple

There is a 10% chance of being under target by $25 million, an 80% chance of meeting target ROI and a 10% chance of going over target by $25 million. Graphically the distribution appears as:



Venture Yellow

There is a 30% chance of being under target by $5 million, a 40% chance of meeting target ROI and a 30% chance of going over target by $5 million. Graphically the distribution appears as:



From Forlani and Mullins (2000).

Appendix B. Scale of perceived new venture risk

For each scale below, kindly circle the number which you feel best assesses the amount of RISK associated with this venture:

HIGH	1	2	3	4	5	6	7	LOW
MINIMAL	1	2	3	4	5	6	7	EXTREME
NOT RISKY	1	2	3	4	5	6	7	VERY RISKY

Appendix C. Risk propensity scale

The following questions will help us better understand your personal feelings about risk. Please answer the following 5 items by circling the alternative (“a” or “b”) you would feel most comfortable with.

1	a) an 80% chance of winning $400, or b) receiving $320 for sure
2	a) receiving $300 for sure, or b) a 20% chance of winning $1,500
3	a) a 90% chance of winning $200, or b) receiving $180 for sure
4	a) receiving $160 for sure, or b) a 10% chance of winning $1600
5	a) a 50% chance of winning $500, or b) receiving $250 for sure

References

Baird, I.S., Thomas, H., 1985. Toward a contingency model of strategic risk taking. Acad. Manage. Rev. 10 (2), 230–243.

Boulding, W., Christen, M., 2001. First-mover disadvantage. Harv. Bus. Rev., October, 1–3.

Bromiley, P., Curley, S.P., 1992. Individual differences in risk taking. In: Yates, J.F. (Ed.), Risk Taking Behavior. Wiley, West Sussex, UK.

Carpenter, G.S., 1987. Modeling competitive marketing strategies: the impact of marketing-mix relationships and industry structure. Manage. Sci. 6, 208–221 (Spring).

Carpenter, G.S., Nakamoto, K., 1989. Consumer preference formation and pioneering advantage. J. Mark. Res. 26, 285–298 (August).

Dess, G.D., Lumpkin, G.T., Covin, J.G., 1997. Entrepreneurial strategy making and firm performance: tests of contingency and configurational models. Strateg. Manage J. 18 (9), 677–695.

Dickson, P.R., 1992. Toward a general theory of competitive rationality. J. Mark. 56, 69–83 (January).

Dickson, P.R., Giglierano, J.J., 1986. Missing the boat and sinking the boat: a conceptual model of entrepreneurial risk. J. Mark. 50, 58–70 (July).

Forlani, D., Mullins, J.W., 2000. Perceived risks and choices in entrepreneurs’ new venture decisions. J. Bus. Venturing 15 (4), 305–322.

Forlani, D., Mullins, J.W., Walker Jr., C. 1995. Playing the odds versus manipulating the odds: a test of two perspectives of risk in new product development decisions. American Marketing Association Winter Educator’s Conference Proceedings, American Marketing Association, Chicago, pp. 402–409.

Golder, P.N., Tellis, G.J., 1993. Pioneer advantage: marketing logic or marketing legend? J. Mark. Res. 30, 158–170 (May).

Green, D.H., Barclay, D.W., Ryans, A.B., 1995. Entry strategy and long term performance: conceptualization and empirical examination. J. Mark. 59, 1–16 (October).

Hammer, M., Champy, J., 1993. Reengineering the Corporation. Harper Business, New York.

Heath, C., Tversky, A., 1991. Preference and belief: ambiguity and competence in choice under uncertainty. J. Risk Uncertain. 4, 5–28.

Kahneman, D., Tversky, A., 1979. Prospect theory: an analysis of decision under risk. Econometrica 47, 263–293 (March).

Kerin, R.A., Varadarajan, P.R., Peterson, R.A., 1992. First-mover advantage: a synthesis, conceptual framework, and research propositions. J. Mark. 56, 33–52 (October).

Krueger Jr., N., Dickson, P. 1994. How believing in ourselves increases risk-taking: perceived self-efficacy and opportunity recognition. Decis. Sci. 25 (3), 385–400.

Lopes, L.L., 1987. Between hope and fear: the psychology of risk. Advances in Experimental Social Psychology 20, 255–295.

MacCrimmon, K., Wehrung, D.A., 1990. Characteristics of risk taking executives. Manage. Sci. 36 (4), 422–435.

March, J.G., Shapira, Z., 1987. Managerial perspectives on risk and risk taking. Manage. Sci. 33 (11), 1404–1418.

McNamara, G., Bromiley, P., 1999. Risk and return in organizational decisions. Acad. Manage. J. 42 (3), 330–339.

Mullins, J.W., 2003. The New Business Road Test. Prentice-Hall/FT, London.

Mullins, J.W., Forlani, D., Walker Jr., O.C., 1999. The effects of organizational and decision-maker factors on new product risk taking: an exploratory study. J. Prod. Innov. Manag. 16 (3), 282–294.

Nunnally, J.C., 1978. Psychometric Theory. McGraw Hill, New York.

Palich, L.E., Bagby, D.R., 1995. Using cognitive theory to explain entrepreneurial risk-taking: challenging conventional wisdom. J. Bus. Venturing 10, 425–438.

Robinson, W.T., Fornell, C., Sullivan, M.W., 1992. Are market pioneers intrinsically stronger than later entrants? Strateg. Manage J. 13, 609–624 (November).

Sahlman, W.A., 1997. How to write a great business plan. Harv. Bus. Rev., July–August, 98–108.

Sarasvathy, S.D., 2001. Effectual reasoning in entrepreneurial decision making: existence and bounds. Academy of Management Proceedings. Academy of Management, New York. ENT: D1–D6.

Schneider, S.L., Lopes, L.L., 1986. Reflection in preferences under risk: who and when may suggest why. J. Exp. Psychol. Hum. Percept. Perform. 12 (4), 535–548.

Shapira, Z., 1995. Risk Taking. Russell Sage, New York.

Simon, M., Houghton, S.M., Aquino, K., 2000. Cognitive biases, risk perception, and venture formation: how individuals decide to start companies. J. Bus. Venturing 12 (2), 113–134.

Sitkin, S.B., Pablo, A.L., 1992. Reconceptualizing the determinants of risk behavior. Acad. Manage. Rev. 17 (1), 9–38.

Sitkin, S.B., Weingart, L.R., 1995. Determinants of risky decision making behavior: a test of the mediating role of risk perceptions and risk propensity. Acad. Manage. J. 38 (6), 1573–1592.

Szymanski, D.M., Troy, L.C., Bharadwaj, S.G., 1995. Order of entry and business performance: an empirical synthesis and reexamination. J. Mark. 59, 17–33 (October).

Thaler, R.H., Johnson, E.J., 1990. Gambling with the house money and trying to break even: the effects of prior outcomes on risky choice. Manage. Sci. 36 (6), 643–660.

U.S. Small Business Administration, 2001. Small Business Economic Indicators 2000. Office of Advocacy, U.S. Small Business Administration, Washington, DC.

Von Neumann, J., Morgenstern, O., 1944. Theories of Games and Economic Behavior. Princeton University Press, Princeton NJ.

Weiner, B., 1985. An attributional theory of motivation and emotion. Psychol. Rev. 92, 548–573 (October).

Yates, J.F., Stone, E.R., 1992. The risk construct. In: Frank Yates, J. (Ed.), Risk Taking Behavior. Wiley, West Sussex, UK.