

The Influence of Entrepreneurial Risk Assessment on Venture Launch or Growth Decisions*

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ABSTRACT. Entrepreneurs are thought to engage in riskier behavior than nonentrepreneurs, yet little empirical evidence supports that intuitively appealing notion. We argue instead that differences in information, not risk aversion, may explain the decision to launch or grow a venture. We separately test *risk taking propensity* and *risk assessment*. We hypothesize that entrepreneurs will not differ from nonentrepreneurs on risk taking propensity. Additionally, we propose and test a model of risk assessment. The sample size for this exploratory study is $n = 53$ with 30 respondents declaring themselves as entrepreneurs and 23 declaring themselves as nonentrepreneurs. The study's design is a simulation. Each respondent is provided with data on a potential acquisition that would result in either the launch of a new venture or significant growth for an existing firm. Consistent with the hypotheses, the results show no difference between entrepreneurs and nonentrepreneurs on the risk taking measure. We also find that we can predict entrepreneurial behavior based on risk assessment. We close with a discussion of limitations and directions for future research.

KEY WORDS: entrepreneurship, launch or growth decisions, risk assessment, risk taking propensity

JEL CLASSIFICATION: M13.

The tiger that does not prowl becomes a rug
Nepalese proverb

1. Introduction

There is a broadly held perception that entrepreneurs engage in risky behavior (Palich and Bagby, 1995). This perspective suggests differential predispositions and actions across entrepreneurs and nonentrepreneurs. We argue that this viewpoint may ignore more fundamental issues such as differences in cognitive process.

We suggest that a convergence of three constructs may advance this debate. We consider the discovery and exploitation perspective from the entrepreneurship literature, decision making heuristics from organizational behavior and psychology, and estimation of parameters from finance and economics. Our first objective is to develop a theoretical perspective that complements and extends existing work on entrepreneurial risk. The second is to test an emergent, information based theory. We argue that entrepreneurs do not necessarily engage in riskier behavior than nonentrepreneurs. Rather, entrepreneurs may *assess* risks differently.

2. Theoretical framework and hypotheses

2.1. Literature review

There are multiple streams of research that converge on risky behavior attributed to entrepreneurs. We believe that each shows an intellectual lineage to prospect theory (Kahneman and Tversky, 1979). The central predictions in prospect theory relate behaviors (risk aversion or risk

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seeking) to probable outcomes (gain or loss). A key feature of prospect theory is "labeling," defined as the decision maker's perception of threat or opportunity with the attendant prospect for loss or gain. We assert that the construct of *risk assessment* is conceptually identical to labeling, commonly used in the domain of entrepreneurship (Norton and Moore, 2002; Palich and Bagby, 1995), and test it in this study.

2.2. Risk taking propensity

Sitkin and Pablo (1992) offer definitions critical to this trait perspective: *risk propensity* as the tendency to take or avoid risk; *risk perception* as the assessment of risk inherent in a situation; *risk behavior* as decisions with varying degrees of uncertainty. They propose two, alternative models of risk behavior. One suggests that risk propensity and risk perception mediate risk behavior (1992, p. 15). The other suggests a moderated relationship, explicitly, that risk propensity moderates the relationship between risk perception and risk behavior (1992, p. 26). Sitkin and Weingart (1995) test the mediated model and report promising results. However, the debate is not closed. Mediation is suggested when there is a demonstrably strong relationship between predictor and criterion (Baron and Kenny, 1986), and empirical results in this domain are mixed (Busenitz and Barney, 1997; Sitkin and Weingart, 1995). In a study that examines the relationships between anticipated venture outcomes and differences in risk propensities, Forlani and Mullins (2000, p. 317) find that risk propensities did not influence perceptions of venture risk. That empirical result directly contradicts the Sitkin and Pablo (1992) prediction.

Risk taking propensity has limited implications for the discovery and exploitation of wealth generating ideas. Brockhaus (1980) studies entrepreneurs and managers with a view toward assessing risk taking propensity. He finds no significant differences across these groups. Masters and Meier (1988) extend this research. They use the same instrument (the Choice Dilemma Questionnaire, hereafter, CDQ) and ask essentially the same question: Do entrepreneurs differ in their risk taking propensity from nonentrepreneurs? They report no significant differences between

entrepreneurs and managers. This empirical evidence on risk propensity runs counter to conventional wisdom and suggests that entrepreneurs exhibit the same propensity to take or avoid risks as the general population. However, other scholars are not as sanguine. Shaver and Scott (1991) critique the CDQ as inappropriate for this research question. The instrument was developed to study *individuation*, the diffusion of responsibility often found in mob behavior. Moreover, it was designed to measure changes in expressed levels of riskiness. Consequently, Shaver and Scott assert that its use as an index of a relatively stable personality trait is methodologically unsound (1991, p. 29).

Sitkin and Pablo (1992) extend the discussion of risk taking propensity, and we take advantage of their indirect support for our competing, theoretical perspective. They argue that risk taking propensity has three determinants: *risk preferences*, a somewhat durable predisposition to accept or decline risk; *inertia*, a habituation of sorts in which the decision maker employs processes and criteria used in past situations; *outcome history*, a phenomenon in which the decision maker attributes outcomes to his or her actions. Further, they propose that risk propensity may be a moderator variable, explicitly, that it influences the relationship between risk assessment and risk behavior (1992, p. 26). We seize upon their conceptualization of risk propensity as a moderator and substitute "priors." *Priors* are information gained by decision makers from prior immersion in a similar context (Venkatraman, 1997). They represent experiential components of the decision making process. This concept of *priors* is our segue into Bayesian probability.

2.3. Risk assessment

Definitionally, risk perception is an assessment of risk (Sitkin and Pablo, 1992). Thus, perception and assessment are interchangeable terms. Our argument that entrepreneurs assess risk differentially is central to this study. Palich and Bagby (1995) share that view:

"...entrepreneurs may simply categorize and subsequently frame the same stimuli differently from

nonentrepreneurs. That is, what has been widely recognized as a propensity for risk on the part of entrepreneur may instead be an artifact of this alternative framing (1995, p. 427)."

Shaver and Scott (1991) make a similar argument. They cite empiricism in which high technology entrepreneurs do not perceive themselves as doing something risky. They suggest abandonment of the study of personological risk assumption, calling instead for study of the risk assessment process. That challenge is our motivation for this study.

The notion of assessment is central to entrepreneurial behavior. The ability to discover and exploit wealth generating ideas fundamentally separates entrepreneurs from nonentrepreneurs (Fiet, 2002). Emergent theory suggests that entrepreneurs may engage in systematic searches that build on prior knowledge in ways that facilitate the recognition and exploitation of opportunities. These differential assessments of environment and resource combinations comport with our argument on risk assessment.

Bayes' theory may help advance our understanding of these relationships between knowledge and behavior. Bayesian probability differs dramatically from classical inference in two ways. The first is that probability in Bayes' framework is defined as the degree of belief that one has in a given proposition. Thus, Bayesian decision making is subjective and derives from the decision maker's personal information about a task (Gardenfors and Sahlin, 1988, p. 4). The second distinguishing feature is that Bayesian probability combines prior information with a sample to yield a posterior distribution/likelihood. Our model flows directly from Bayesian probability: *informative priors* $\times$ *current data* = *the decision maker's assessment*.

Bayesian theory holds that prior information comes in two levels of completeness – noninformative or diffuse priors and informative priors (Chen and Moore, 1985). Consider an abstract example. You are thrust into a combat situation. You come across a soldier with a life threatening wound, and you must attend to this injured warrior. You are an entrepreneurship scholar with no training in the treatment of trauma wounds. Your priors are noninformative or diffuse, and the probability of a successful intervention is

low. Alternatively, imagine that you are a medic newly assigned to this infantryman's unit. Your military training and experience qualify you to render first aid. In a Bayesian context, your priors are informative.

Some priors are more informative than others. Returning to the example, your training as a medic is rudimentary and you may lack meaningful experience. The likelihood of a successful intervention improves over the diffuse case, but the limitations are clear. Now suppose that you are transformed into the battalion surgeon. You hold a terminal degree in medicine and have completed a residency in trauma medicine. Your priors are informative, both educationally and experientially. The probability of a successful intervention is high.

Prior information leads to greater precision in assessing probabilities. Bayesian decision making suggests that an entrepreneur's informative priors may result in a more favorable assessment of a project's viability or a more accurate assessment of its limitations. Such assessments may facilitate the decision to launch a venture or adopt a growth strategy. Alternatively, a nonentrepreneur may see greater variability in outcomes due to diffuse or noninformative priors and decline the opportunity. A casual observer might attribute the entrepreneur's behavior to a high level of risk tolerance, but we argue that the entrepreneur's decision is based on information, rather than the trait of risk taking propensity.

Risk behavior may be defined as decisions with uncertain outcomes (Sitkin and Pablo, 1992). Clearly, behavior is an actionable state and presents different measurement challenges when compared with cognitive processes such as analysis or formulation. Researchers must often accept a respondent's perception of risk and declared intentions as surrogates for behavior. Palich and Babgy (1995) report such a study. They assess differences between entrepreneurs and nonentrepreneurs and find significant differences, viz, the entrepreneurs assessed the environment more favorably with respect to opportunities and threats. Moreover, the entrepreneurs perceived greater organizational strengths and fewer weaknesses. Cooper et al. (1988) converge on a similar finding, specifically, that entrepreneurs assess risks more favorably.

We conceptualize this actionable state of risk behavior in the domain of entrepreneurship as the decision to either launch a new venture or adopt a growth strategy and test it in this study.

2.4. Hypotheses

We follow Brockhaus (1980), Busenitz and Barney (1997), Masters and Meier (1988), and others in the development of our first hypothesis. Thus:

H1: Entrepreneurs will not differ significantly in risk taking propensity from nonentrepreneurs.

What, then, accounts for differences in behavior *vis-a-vis* entrepreneurs and non-entrepreneurs? We propose a second hypothesis. Our principal argument is that entrepreneurs may assess risk differently than nonentrepreneurs. This differential risk assessment should become manifest in a more favorable assessment of opportunities (Palich and Bagby, 1995). Therefore:

H2: Entrepreneurs will assess venture opportunities more favorably than nonentrepreneurs.

3. Research methods

3.1. Design

The central objective of this research is to study risk assessment and its implications for entrepreneurial decision making, which we study with a simulation. There is precedent for that design choice. Forlani and Mullins (2000) studied the effects of risk propensities on anticipated outcomes. Their subjects, 78 CEOs of high growth ventures, expressed their preferences by selecting among four hypothetical ventures, two with low variability in outcomes and two with high variability in outcomes. Smith et al., (1988) had 15 entrepreneurs and 13 managers answer a set of questions about a decision making scenario. We craft a similar, decision making task and acknowledge the tradeoffs embedded in our design choice. Content validity is enhanced, but we may be legitimately criticized for lack of generalizability. Given the stage of our research and the relatively "tight" question (the influence of risk assessment on venture launch or growth), we argue that the design matches the question.

We present a vignette to a sample frame of entrepreneurs and nonentrepreneurs that describes an opportunity to acquire an existing business. The acquisition of this hypothetical business would represent a significant launch or growth decision for every respondent in the sample. The target business is located in the same industry from which all respondents were drawn. That shared situs controls for variability in domain knowledge. The respondents are asked to evaluate the business and set forth two purchase prices – their optimal acquisition price and the highest price that they would pay. This task requires application of their industry specific, prior knowledge in thoughtful analysis of the business as it exists, futuristic projections of the firm as recast to reflect the entrepreneurial intent of each potential acquirer, and a valuation of the target by each respondent. The hypothetical business is given the attributes of a long operating history, the potential for excellent profitability, and significant challenges.

The vignette describing this acquisition opportunity is in the Appendix. The challenges to profitability are far ranging: current fees are below market with the implications of client attrition if raised; the target firm's information technology systems are dated or otherwise deficient, suggesting capital needs well beyond the purchase price; the target is currently losing money, suggesting a negative valuation; and the seller wants a non-contingent price for the business. On the other hand, effective intervention by an aspirant, coupled with efficient use of resources, could yield earnings well in excess of normal profits. The classic definition of risk is variability in outcomes (Dollinger, 1999). Here, the entrepreneurial decision making task is to make a risk assessment. Each respondent must assess the current data (the operating characteristics of the acquisition target as set forth in the vignette) informed by industry specific knowledge (priors), make a probabilistic estimate (the likelihood) of performance outcomes, and estimate a net present value for the acquisition target.

3.2. Sample

The choice of sample frame has particular significance to this study. There must be relative

homogeneity across all potential respondents on several critical attributes. This homogeneity should embrace education, standing in the business community, and venture opportunities. Education in any business discipline suggests a common grounding in the organizational sciences. Financiers generally respond more favorably to entrepreneurs who are degreed in business when compared to aspirants without comparable education (see Shane, 2003, p. 189, for a review). Access to capital is a touchstone for all nascent entrepreneurs. We reason that our sample frame must exhibit homogeneity with respect to capital accessibility. Moreover, an educational path may either impel or constrain choices. For example, only law school graduates can establish law practices; nonlawyers are barred from this activity. The notion of relative homogeneity takes on genuine importance in this inquiry because venture opportunities could be foreclosed by differential characteristics across respondents. Consequently, we have selected on the criteria of education and career path. There is support for purposive sampling in exploratory research. This form of deliberate selection is appropriate when the researcher wishes to include respondents in the sample who share topically important attributes (Dess et al., 1997; Kerlinger, 1986).

We chose Certified Public Accountants (CPAs) as our sample frame. All permit holders are similarly educated, possess the same professional credential, and generally may pursue comparable business opportunities. Data from the American Institute of Certified Public Accountants, a professional association of about 250,000 licensed CPAs, suggest that about half of those with active permits to practice accountancy start and manage rent generating firms while the other half pursue traditional careers in industry, government, or education. Therefore, we expect to find a proportionally high representation of entrepreneurs in this group and believe that this natural, within-profession distribution of entrepreneurs and nonentrepreneurs may help us capture the phenomena of interest.

We acknowledge the widely differing conceptualizations of entrepreneur. For example, Busenitz and Barney (1997) define entrepreneurs as those who have either founded a firm within the last 2 years or plan to launch within the next 5 years.

Stewart (1991) argues that entrepreneurs are organizational actors who create rents through innovation. Ronstadt (1984) classifies all entrepreneurs into three, discrete categories driven jointly by motivation and outcome: life style ventures, small, profitable ventures, and high growth ventures. Other conceptualizations exist, but any reconciliation is beyond the scope of this paper. We follow Ronstadt in this study, observing that CPAs fit discreetly within his classification of entrepreneurs who launch and grow firms that become small, profitable ventures. The principals of these professional service firms rarely cede operational control or equity ownership outside of the founding group, yet they go through every stage of venture launch and growth from start up through merger, with an occasional liquidity event.

3.3. Data collection

No instrument exists which meets our objective of testing risk assessment, so we developed an original questionnaire (see Appendix). Our decision to use a purposive sample frame of CPAs brought about a need for a decision making scenario that has content validity for all potential respondents. A former CPA who possesses academic credentials developed a plausible set of operating characteristics about a hypothetical, acquisition target. The objective was to create a content rich document that would permit any respondent with domain knowledge to make well informed decisions on strategies, processes, and other operating considerations. Explicitly, what in the target firm should be retained? Changed? What are the implications for performance? Valuation? The questionnaire's central feature is a vignette that describes an opportunity to acquire an existing business. The business has a long operating history, offers the potential for excellent profitability, yet it presents significant challenges. The respondents are asked to evaluate the business and set forth two purchase prices – their optimal price (explicitly, the lowest/most favorable purchase price) and the highest price that they would pay. We also collect data on each respondent's current occupation, years of industry experience, and score on a measure of risk taking propensity.

This research was supported by the Continuing Professional Education department of a large

(≈18,000 members), state society of CPAs located in the United States. We were granted access to its membership database and randomly selected 500 permit holders. The questionnaires were mailed with a letter introducing the research, suggesting its benefits, and asking for participation. A stamped, return envelope was included. There was no follow up protocol. Thirty two questionnaires were returned as undeliverable. We received 53 usable questionnaires for a response rate of 11%. We are satisfied with that participation, recognizing that our respondents are busy executives rather than conscripted students. Other scholars report similar relationships with respect to response rate and sample size. For example, Forlani and Mullins (2000) report a study on risk perception and risk taking propensity in which the response rate was 14% with $n = 78$.

3.4. Variables

We assess three, primary variables. The first is a categorical variable that permits us to classify respondents. All respondents declare their current, occupational position from among six choices. Respondents who are principals in their own firms unambiguously fall into the category of entrepreneurs; the other four categories capture nonowners/managers (nonentrepreneurs in this study). Current position is thus dichotomized as entrepreneur (ENEUR) or nonentrepreneur (NONENEUR).

The next variable is a perceptual measure of risk taking propensity denoted by RISK. Our objective is to comparatively assess entrepreneurs and nonentrepreneurs on this trait. Hypothesis 1 reveals our expectation. We do not expect to detect average differences between these two groups on this risk tolerance trait. It has four items, uses a 7 point, Likert style scale, and measures willingness to take risks (Gomez-Mejia and Balkin, 1989). The four items are summed to derive a single score of risk taking propensity. The range of responses on the measure would be 4 (least risk averse) to 28 (most risk averse). We have modified it nominally so that it has content validity in our study. We considered other measures of risk taking propensity: the Jackson Personality Inventory (Busenitz and Barney, 1997; Stewart et al., 1998), the Choice Dilemma

Questionnaire (Brockhaus, 1980; Masters and Meier, 1988), adaptations of a bipolar, risk style scale (e.g., Forlani and Mullins, 2000), and multi item, Likert style scales (MacCrimmon and Wehrung, 1990; Sitkin and Weingart, 1995). We judge the Gomez-Mejia and Balkin (1989) scale to be the best measure of self reported attitudes toward risk taking for its construction, prior use and validation in a number of studies, and high, inter item reliability (Cronbach's $\alpha = 0.86$ in our study).

The third, primary variable captures risk assessment across all respondents. We argue that an information based perspective should distinguish entrepreneurs from nonentrepreneurs. Each respondent declares the highest price that (s)he would be willing to pay for the acquisition target. Highest price is, explicitly, each decision maker's estimate of the target's net present value. Therefore, we operationalize highest price as a surrogate for each respondent's most favorable risk assessment of the target – the Bayesian model of current data influenced by prior knowledge. Risk assessment is measured as the maximum purchase price, denoted by HI, that a respondent would be willing to pay. It is an objective measure; the range of responses is from zero to infinity.

We employ two control variables. First, we measure years of industry experience. The experience issue raises a paradox. Are “young” (read: inexperienced) entrepreneurs more inclined to venture launch or growth when compared with their more senior colleagues? Are “old” (read: experienced) entrepreneurs more risk averse? Alternatively, do these same “old” entrepreneurs have informative priors that permit more precise estimates? Are they negatively influenced by time compression, opportunity costs, or uncertainty? Each perspective has intuitive appeal, but insufficient theoretical support to warrant formal testing. MacCrimmon and Wehrung (1990) find that mature executives are less willing to take risks than younger executives with limited industry experience. This age/seniority finding was empirically derived using data reduction techniques. Shane reviews this research stream and reports multiple, cross cultural studies that show that age has a curvilinear relationship with self employment, firm formation, growth, profitability, and venture survival (2003: 89 *et seq.*). Though this empirical evidence offers gentle persuasion, we are confronted

with the problem of endogeneity and the absence of theory. Simply put, there may be unmeasured variables that confound these empirical results of age/experience relationships. Given the atheoretical nature of these findings, we capture years of industry experience as a control variable. It is an objective measure with a range bounded by zero and the working life of a respondent. Next, an indicator variable is coded as 1 or 0 depending on whether the respondent is employed in industry or government. The control variables are denoted by YEARS and INDU, respectively.

4. Analysis and results

Descriptive statistics and correlations are presented in Table I. Our results on the categorical variable of current occupation comport with Ronstadt's (1984) definition of entrepreneurs who launch and manage small, profitable ventures. Fifty six percent of the respondents in this sample identify themselves as entrepreneurs meeting those criteria. The mean of RISK for the 30 entrepreneurs in the sample is 11.633, while RISK for the 23 nonentrepreneurs has a mean of 13.130. The difference between means is not statistically significant ($P < 0.3496$). This test statistic assumes equal variances as F was non-significant ($F = 1.36$, $P < 0.4375$). Thus, risk taking propensity does not appear to vary, whether entrepreneur or not. We test for inter item reliability with Cronbach's coefficient alpha. The result for the four item risk measure adapted from Gomez-Mejia and Balkin (1989) is 0.86.

TABLE I
Descriptive statistics and correlations, $n = 53$

	YEARS	RISK	INDU	HI
(A) <i>Summary statistics</i>				
Mean	16.12	12.28	0.21	445,578
Standard Deviation	8.70	5.72	0.41	78,294
Median	15.00	11.00	0.00	450,000
Maximum	48.00	28.00	1.00	725,000
Minimum	2.00	4.00	0.00	250,000
(B) <i>Correlations matrix</i>				
YEARS	1.000			
RISK	0.0419	1.000		
INDU	-0.1833	-0.1078	1.000	
HI	-0.3844	-0.1497	0.1661	1.000

The distribution of RISK deviates significantly from normality (Shapiro and Wilk 1965 statistic). Therefore, we supplement the traditional test of mean differences by examining differences in medians. Employing the standard nonparametric test, we cannot reject H1. The chi-squared statistic ($df = 1$) is 0.17, significant only at the 0.68 level. From both tests of differences in location, we conclude that RISK is not different for entrepreneurs on average.

A more complete test of H1 is conducted by estimating an analytic model that predicts whether the respondent is an entrepreneur. We code a new variable ENEUR as 1 if entrepreneur and 0 otherwise. We then estimate a logit model of ENEUR using RISK as the test variable. We add YEARS as a control variable. The results are presented in Table II.

We report the full model in the first column of Table II. RISK enters with a negative sign and is insignificant at conventional levels (test statistic = -1.24). Thus, RISK is not reliably related to ENEUR. Moreover, the negative sign runs counter to the suggestion that entrepreneurs are more risk tolerant than others. In the second column of Table II, we suppress YEARS and the result for RISK is the same – a negative coefficient estimate insignificant at conventional levels (test statistic = -0.95). H1 is supported.

Interestingly, YEARS (number of years of industry experience) enters with a positive sign, with coefficient estimates significant at the 0.01 level (test statistic = 3.00). Thus, industry experience shows a strong association with entrepreneurial behavior in our sample.

In results not reported, we also include the control variable INDU in the model, and the

TABLE II
Logit estimation of ENEUR (= 1 if entrepreneur, 0 otherwise)

	(1) Full model	(2) Abbreviated model
Intercept	-1.373 (-1.37)	0.846 (1.25)
RISK	-0.075 (-1.24)	-0.047 (-0.95)
YEARS	0.163 (3.00)***	

***Significant at the 0.01 level.

finding for RISK is unchanged – negative and insignificant. Separately, we estimate ENEUR using a probit specification, and the results are essentially unchanged.

The second hypothesis is tested by estimating a linear model of HI using ENEUR and RISK (YEARS and INDU are included as control variables). The model is estimated by ordinary least squares, and the results are reported in Table III.

Clearly, those whom we judge to be entrepreneurs (ENEUR = 1) tend to bid higher maximum prices, consistent with our hypothesis H2. The coefficient estimate is positive and significant ($t = 2.31$, $P < 0.05$). YEARS exhibits significant explanatory power ($t = -3.66$, $P < 0.01$). INDU is marginally significant ($t = 1.91$, $P < 0.10$). Importantly, the coefficient for RISK is negative and insignificant ($t = -0.47$). Thus, risk tolerance is not associated with the price assessed by the respondents. R^2 for the full model is 0.2755.

In column (2) of Table III, we suppress RISK and find that R^2 decreases nominally to 0.2718. Thus, RISK exhibits almost no explanatory power. In other models not reported, we suppress ENEUR and include RISK to judge whether our findings are due to multicollinearity. R^2 falls substantially and RISK continues with a negative and insignificant coefficient estimate. Separately, we examine the data for multicollinearity by inspecting variance inflation factors (VIFs) for each explanatory variable. The highest VIF is 2.5, substantially below alarming levels (Birkes

and Dodge, 1993). Additionally, we examine the explanatory variables for high influence observations using Cook's (1977) distance measure; it is insignificant (Chatterjee and Hadi, 1988).

The results in favor of ENEUR and against RISK are robust to various model specifications. We estimate the same model using White's (1980) modification of the t -statistics for heteroskedasticity, and the results are the same. ENEUR is significant and positive, while RISK is insignificant.

5. Discussion

The data in our sample support both hypotheses under a variety of specifications. Thus we conclude that entrepreneurs do not differ from nonentrepreneurs on risk taking propensity, and we find that entrepreneurs tend to assess risk more favorably. We have no wish to overstate the results of this study, but there are lessons to be learned.

The first squarely addresses the notion that entrepreneurs engage in risky behavior. Our results suggest that there is no difference on average in risk taking propensity. A number of earlier studies (for example, Brockhaus, 1980) have yielded that finding but used an instrument (the CDQ) that has been criticized as inappropriate. Empirical results are mixed for other studies using different scales. Twenty odd years of examining risk taking propensity has yielded inconclusive results.

We expressed our theoretical preference for differences in risk assessment. We operationalized favorable risk assessment as the willingness to acquire a competing business at a high price. All respondents had exactly the same information, yet those who are currently in entrepreneurial roles were strongly and positively associated with a willingness to pay a high price. That result comports with our expectations. However, we are reminded that industry experience is negatively associated with the willingness to pay a high price. We appreciate the significance of that relationship, yet the "age/years-of-experience" finding is equivocal. Why are inexperienced entrepreneurs more willing to pay a high price? We could speculate that they see a different horizon – more time to recover from mistakes, fewer personal assets at risk, no loss of prestige or position, and so on. The vogue practitioner term is that they have less "skin in the game."

TABLE III
Estimation results of the model $HI = b_0 + b_1 ENEUR + b_2 RISK + b_3 YEARS + b_4 INDU + \varepsilon$

	(1) Full model	(2) Abbreviated model
Intercept	484,016 (13.44)***	471,947 (19.02)***
ENEUR	69,039 (2.31)**	71,559 (2.46)**
RISK	-899 (-0.47)	
YEARS	-5,146 (-3.66)***	-5,212 (-3.76)***
INDU	61,698 (1.91)*	64,395 (2.05)**
R^2	0.2755	0.2718

*, **, *** Significant at the 0.10, 0.05, and 0.01 levels, respectively.

Certainly, we could reverse these same speculations with respect to experienced entrepreneurs, but would that explanation be complete? It is possible (indeed, likely) that the experienced entrepreneurs have made a more precise estimate of the new venture and so decline to overpay. This study falls short of answering that question. We did not assess our respondents' individual, cognitive processes in evaluating opportunities.

There is a related phenomenon as we consider intraorganizational groups. This risk assessment approach may have value in staffing decisions. It could facilitate selection or advancement based on entrepreneurial tendencies. We frame this argument in the context of the classic strategy paradigm (Hofer and Schendel, 1978). Say, for example, that an organization identifies the need for renewal and wishes to organize a team capable of corporate entrepreneurship. On what criteria would the team members be selected? We know that entrepreneurs and nonentrepreneurs have similar risk taking propensities. They seem to differ on risk assessment. If true, a firm's human resource management staff could administer an instrument similar to our vignette/questionnaire and form a team with appropriate skill sets.

6. Limitations and directions for future research

We have studied individual decision making. Much could be learned by expanding the scope of future inquiries to embrace group decision making. The dynamics of group decision making are markedly different from individuals charged with the same task, whether an entrepreneurial team launching an independent venture or an intact work group bound by its organization's administrative heritage. Attributable to this focus on individual decision making, we do not consider the implications of organizational context – industry environment, culture, reward systems, structural impediments, or the like. We see value to each of those questions, but they are beyond the scope of this study.

Our study is a simulation, and that choice typically yields high internal validity, but low external validity. It is cross sectional. We have no longitudinal data, foreclosing any opportunity for time series analysis. Finally, we acknowledge the implications of confounds. What unobserved vari-

ables may have impacted our study, whether to yield spurious results or obscure true relationships? If identifiable, we would measure or control for them. We simply recognize that endogeneity is present in all social science research.

Our sample may be criticized. Admittedly, the sample size is small ($n = 53$). However, the cells are comparably sized (ENEURs = 30, NONE-NEURs = 23). Our results were robust to multiple specifications, but bigger is better in terms of precise estimates of parameters. Moreover, a larger sample would permit greater analytic sophistication. For example, a discriminant function analysis would likely yield a better prediction of group membership – entrepreneur or not. We could be criticized for the homogeneous sample frame. We believe that a criteria-based, purposive selection is appropriate for this exploratory study. The counterpoint is that a larger, more diverse sample has the potential to yield additional insight.

With these promising relationships identified, the scope of this inquiry should be expanded to study other, relatively homogeneous groups selected on attributes that may predict entrepreneurial success. Another concern would be the parochial nature of this study. We choose a U.S. based sample frame, reasoning that a limited domain study may advance our understanding of these phenomena without the difficulties of controlling for or capturing cultural differences. Indeed, a logical extension of this research stream would be to replicate this study in other countries.

We believe that a moderated model may have powerful, predictive value. Sitkin and Pablo (1992) propose a model in which risk perception influences risk behavior moderated by risk propensity. We suggest an adaptation of that model in which *risk assessment* supplants risk perception as the independent variable (Kirzner, 1985; Palich and Bagby, 1995; Shaver and Scott, 1991); the *decision to launch or grow* is the outcome measure (Sitkin and Pablo, 1992, and their use of risk behavior as the outcome measure); and *priors* from Bayesian probability (Chen and Moore, 1985) become the moderator, supplanting risk propensity as advanced by Sitkin and Pablo, (1992). We believe that the independent, moderator, and dependent variables can be competently operationalized, but foresee challenges in capturing

aspirants' cognitive processes as they evaluate venture opportunities.

7. Conclusion

Risk taking propensity is trait based. Much trait research is inconclusive (Shaver and Scott, 1991; Yukl, 2002). The perspective of risk assessment is information based. Theory suggests that an experiential component of decision making influences behavior. Explicitly, priors derived from Bayesian probability, whether informative, diffuse, or noninformative, seem to offer the promise of explication. The results of this exploratory study offer modest support for two assertions. The first is that entrepreneurs do not differ from nonentrepreneurs in risk taking propensity. The second is that entrepreneurs assess risk more favorably.

Appendix A

A.1. *The targeted practice*

Assume that you are planning to make an acquisition such as the one described below. You may be a practitioner interested in growth; an industry accountant who faces outplacement; an educator looking for new challenges; a newly certified staff accountant who desires enhanced independence and income. Assume further that you have no co-principals in this venture. All practice management and practice development functions will be your responsibility until or unless you subsequently admit other principals.

The target firm is 100% owned by a retirement-minded practitioner. It has existed in the same form for 17 years. The firm is committed to high ethical standards and technical competence. There is no history of complaints or chronic, peer-review deficiencies.

All clients are co-located in the same metro area as the Firm. The client base is relatively stable and has an average tenure of 6.5 years with the Firm. There is no industry concentration, most are nonpublic companies, and none accounts for more than 5% of revenue. The staff consists of six professionals and three support staff. Two of the professional staff are certified; four are not. There are two paraprofessionals and one secretary.

Fees are generally 25% below market across all staff levels and all types of service. All compilations and reviews are fixed fee engagements with aggregate realization of approximately 60%.

Revenue by type of service is provided by the withdrawing principal. Your strategy is to shift the emphasis from reliance on backward looking services to the value-added domain of forward looking services. The data are:

Type of Service	(Seller) Current %	(You) Projected %
Audit	10	0
Comp & Review	30	25
Tax Prep	30	25
Tax Planning	15	25
Mgmt Advisory	15	25

You sense that this contemplated shift in emphasis may offer the potential to increase realization, accelerate collections, limit liability, and differentiate the practice unit from other local firms.

The seller has neither formulated nor implemented any sort of strategic plan. Any growth is attributable to referrals. There is no systematic plan for client retention, expanded services to existing clients, or active marketing.

The Firm is relatively low on the information technology scale. It has several 386-class PCs for general ledger maintenance, report generation, word processing, and spread sheet applications. It uses a service bureau for all business and individual tax returns. There is no local area network, email, modem, client interface, internet access, or CD-ROM capability.

Fixed assets such as business machines and furniture have negligible value. They are functional but fully depreciated with no value in the aftermarket. There are no notes or capital leases payable.

The Firm occupies 5000 square feet of office space in a modern building. It pays market rates. It has an annual lease, renewable with 60 days notice. The successor may negotiate and execute a long-term lease.

The seller has provided some non-sensitive financial data so that you may make a preliminary assessment of interest. The seller will grant unrestricted access to the Firm's records, staff, and clients after a purchase agreement has been executed. You may propose and negotiate those contingencies that you deem to be appropriate. The data for the most recent fiscal year are:

Staff	Hourly Rates	Targeted Billable Hrs	Actual Billings	Actual Salaries
Prin	\$ 150	1400	\$ 135k	\$ 150k
Srs (2)	100	1625 each	210k	50k each
Jrs (4)	75	1550 each	300k	35k each
Paras (2)	50	1250 each	80k	20k each
		13,350	\$ 725k	\$ 430k

A.2. *The Deal*

The seller plans to remain for one year with the objectives of billing 1200 hours and facilitating a seamless transition. Thereafter, the withdrawing principal will have no obligation to the practice.

Staff	Hourly Rates	Targeted Billable Hrs	Actual Billings	Actual Salaries
Operating Expenses				
Personnel Costs		\$ 390k		
Prof salaries		60k		
Support salaries (includes secretary)		135k		
Fringe benefits (statutory & elective)		7k		
CPE costs		15k		
Prof liab insur				
Occupancy Costs		75k		
Rent		10k		
Phone		2k		
Insur				
General & Admin Costs		51k		
Income from operations		\$ (20k)		

The terms are non-traditional. The seller watched a colleague agonize after selling a practice for 25% of collections over a four year period. The purchasers “cherry picked,” focusing on promising clients and ignoring others. This colleague’s most valuable asset and retirement income were profoundly compromised. The seller insists that the purchase price must be a sum certain. It will be paid at the rate of 25% of collections until the obligation is discharged.

The seller has engaged two firms specializing in mergers and acquisitions to value the practice. Interestingly, both firms adopted a discounted-cash-flow approach, and their valuations converged on essentially the same range of values. The highest value was estimated to be \$ 585,000, and the lowest was estimated to be \$ 365,000. The seller has expressed a strong preference for \$475,000.

A.3. Your assessment

Now, the three, multiple-item questions. First, we need to classify respondents based on career paths. We will follow by asking for your assessment of the practice’s value and close by gathering data on a measure related to decision making.

Current Position

(Select One)

- ☐ Industry How many years in the
☐ Government accounting profession ☐
☐ Education
☐ Principal, CPA firm
☐ Staff, CPA firm
☐ Principal, Non-CPA firm

If you are a principal in any firm, please indicate the four-digit, standard industrial classification (SIC) code which best describes your business and its most recent return-on-assets (ROA) ratio:

SIC: ROA:

A.4. Purchase price

Recall that the seller wishes to sell the practice for \$475,000. We’re going to ask for a range of values that you assign to this potential acquisition. Disregard the seller’s probability of accepting or rejecting your offer but please make your offer(s) authentic.

What is your optimum purchase price, explicitly, the price that you wish to pay that would maximize your long-term return?

\$

Alternatively, what is highest price that you would pay for this practice unit?

\$

Finally, we ask for your response to a four-item measure that has been validated in previous studies. For each item, please select the number from the scale provided which best reflects your assessment and place it in the blank. (see measure at top of page).

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree
— a)	I am not willing to take risks when choosing a work environment.					
— b)	I prefer a low risk/high security work environment with predictable income over a high risk and high reward environment.					
— c)	I prefer to remain in an environment that has problems that I know about rather than to take the risks of a new environment that has unknown problems, even if the new environment offers greater rewards.					
— d)	I view job-related risk as a situation to be avoided at all costs.					

Note

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References

- Baron, R. M. and D. A. Kenny, 1986, 'The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations', *Journal of Personality and Social Psychology* **51**(6), 1173–1182.
- Birkes, D. and Y. Dodge, 1993, *Alternative Methods of Regression*, New York: John Wiley and Sons, Inc.
- Brockhaus, R.H. Sr., 1980, 'Risk Taking Propensity of Entrepreneurs', *Academy of Management Journal* **23**(3), 509–520.
- Busenitz, L. W. and J. B. Barney, 1997, Differences between Entrepreneurs and Managers in Large Organizations: Biases and Heuristics in Strategic Decision Making, *Journal of Business Venturing* **12**, 9–30.
- Chatterjee, S. and A. Hadi, 1988, *Sensitivity Analysis in Linear Regression*, New York: John Wiley and Sons, Inc.
- Chen, S. and W. T. Moore, 1985, 'The Expected Net Present Value Rule under Informative and Noninformative Prior Distributions', *Advances in Financial Planning and Forecasting* **1**, 209–224.
- Cook, R. D., 1977, 'Detection of Influential Observations in Linear Regression', *Technometrics* **19**, 5–18.
- Cooper, A. C., C. Y. Woo and W. C. Dunkelberg, 1988, 'Entrepreneurs' Perceived Chances for Success', *Journal of Business Venturing* **3**(1), 97–108.
- Dess, G. G., G. T. Lumpkin and J. G. Covin, 1997, 'Entrepreneurial Strategy Making and Firm Performance: Tests of Contingency and Configurational Models', *Strategic Management Journal* **18**(9), 677–695.
- Dollinger, M. J., 1999, *Entrepreneurship: Strategies and Resources*, (2nd ed.), Upper Saddle River, NJ: Prentice Hall.
- Fiet, J. O., 2002, *The Systematic Search for Entrepreneurial Discoveries*, Westport, CT: Quorum Books.
- Forlani, D. and J. W. Mullins, 2000, Perceived Risks and Choices in Entrepreneurs' New Venture Decisions, *Journal of Business Venturing* **15**(4), 305–322.
- Gardenfors, P. and N. Sahlin, 1988, *Decision, Probability, and Utility*, New York: Cambridge University Press.
- Gomez-Mejia, L. R. and D. B. Balkin, 1989, Effectiveness of Individual and Aggregate Compensation Strategies, *Industrial Relations* **28**(3), 431–445.
- Hofer, C. W. and D. Schendel, 1978, *Strategy Formulation: Analytic Concepts*, St. Paul, MN: West Publishing Company.
- Kahneman, D. and A. Tversky, 1979, 'Prospect Theory: An Analysis of Decision under Risk', *Econometrica* **47**, 263–291.
- Kerlinger, F. N., 1986, *Foundations of Behavioral Research* (3rd ed.), Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.
- Kirzner, I. M. 1985, *Discovery and the Capitalist Process*, Chicago: University of Chicago Press.
- MacCrimmon, K. R. and D. A. Wehrung, 1990, 'Characteristics of Risk Taking Executives', *Management Science* **36**(4), 422–435.
- Masters, R. and R. Meier, 1988, 'Sex Differences and Risk Taking Propensity of Entrepreneurs', *Journal of Small Business Management* **26**(1), 31–35.
- Norton W. I. Jr. and W. T. Moore, 2002, 'Entrepreneurial Risk: Have We Been Asking the Wrong Question?' *Small Business Economics* **18**(4), 281–287.
- Palich, L.E. and D.R. Bagby, 1995, 'Using Cognitive Theory to Explain Entrepreneurial Risk Taking: Challenging Conventional Wisdom', *Journal of Business Venturing* **10**, 425–438.
- Ronstadt, R., 1984, *Entrepreneurship: Text, Cases and Notes*, Dover, MA: Lord Publishing.
- Shane, S., 2003, *A General Theory of Entrepreneurship: The Individual-Opportunity Nexus*, Cheltenham, UK: Edward Elgar.
- Shapiro, S. S. and M. B. Wilk, 1965, 'An Analysis of Tests for Normality', *Biometrika* **52**, 591–611.
- Shaver, K. G. and L. R. Scott, 1991, Person, Process, and Choice: The Psychology of New Venture Creation, *Entrepreneurship Theory and Practice* **16**(2), 23–45.
- Sitkin, S. B. and A. L. Pablo, 1992, 'Reconceptualizing the Determinants of Risk Behavior', *Academy of Management Review* **17**(1), 9–38.
- Sitkin, S. B. and L. R. Weingart, 1995, Determinants of Risky Decision Making Behavior: A Test of the Mediating Role of Risk Perception and Propensity, *Academy of Management Journal* **38**(6), 1573–1592.
- Smith, K., M. Gannon, C. Grimm, and T. Mitchell, 1988, 'Decision Making Behavior in Smaller Entrepreneurial and Larger Professionally Managed Firms', *Journal of Business Venturing* **3**(3), 223–232.
- Stewart, A., 1991, 'A Prospectus on the Anthropology of Entrepreneurship', *Entrepreneurship Theory and Practice* **16**(2), 71–91.
- Stewart W. H. Jr., W. E. Watson, J. C. Carland and J. W. Carland, 1998, 'A Proclivity for Entrepreneurship: A Comparison of Entrepreneurs, Small Business Owners, and Corporate Managers', *Journal of Business Venturing* **14**, 189–214.
- Venkatraman, S., 1997, 'The Distinctive Domain of Entrepreneurship: An Editor's Perspective', in J. Katz and R. Brockhaus (eds.), *Advances in Entrepreneurship, Firm Emergence and Growth*, vol. 3. New York: JAI Press, pp. 119–138.
- White, H., 1980, 'A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity', *Econometrica* **48**, 817–838.
- Yukl, G., 2002, *Leadership in Organizations*, 5th ed., Upper Saddle River, NJ: Prentice Hall.

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