



## AFFORDABLE LOSS: BEHAVIORAL ECONOMIC ASPECTS OF THE PLUNGE DECISION

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*Affordable loss involves decision makers estimating what they might be able to put at risk and determining what they are willing to lose in order to follow a course of action. Using the entrepreneur's new venture plunge decision, this article combines insights from behavioral economics to develop a detailed analysis of the affordable loss heuristic. Specifically, we develop propositions to explain how individuals: (1) decide what they can afford to lose; and (2) what they are willing to lose in order to plunge into entrepreneurship. The article also discusses the implications of affordable loss for the economics of strategic entrepreneurship. Copyright © 2009 Strategic Management Society.*

### INTRODUCTION

Several theories exist to provide guidance for the individual facing the *plunge decision*—the choice faced by a potential entrepreneur to make an initial commitment to a de novo venture.<sup>1</sup> Classic risk-return analysis is often prescribed as the way to help make this decision. The decision criteria used in such analyses usually urge would-be entrepreneurs to calculate the net present value (NPV) of future risk-adjusted returns while taking into account their opportunity costs in terms of job market value (Benz, 2006; Eisenhauer, 1995; Hamilton, 2000). For

example, Campbell (1992: 12) states that ‘an individual’s decision whether to become an entrepreneur will be based upon a comparison of the expected reward to entrepreneurship and the reward to the best alternative use of his [or her] time.’ Amit, Muller, and Cockburn (1995) found empirical support for the hypothesis that the lower the opportunity costs of individuals, the more likely they are to undertake entrepreneurial activity.

Recently, an alternative approach based on real options has been suggested, particularly at the firm level—for example when a firm is considering taking the *plunge* into new technology positioning projects (McGrath, 1997). Real options analysis enables decision makers to more accurately value investment opportunities in instances where investments can be incurred in stages (Dixit and Pindyck, 1994). In arguing for the value of viewing entrepreneurial investment decisions through a real options lens, McGrath (1999: 14) states that ‘if investments are staged so that expenditures end under poor conditions, losses can be contained.’

Keywords: affordable loss; entrepreneurship; behavioral economics; effectuation

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<sup>1</sup>In this article, we use the term *plunge decision* interchangeably with the terms *entry into entrepreneurship* and *the self-employment decision*.

A third approach based on the *affordable loss* principle has been outlined by Sarasvathy (2001a). This heuristic was induced from empirical studies of entrepreneurial expertise (Sarasvathy, 2001b), as experts (Chase and Simon, 1973) exhibit high performance in their domains (Ericsson and Lehmann, 1996). Affordable loss is one component of effectuation, a set of heuristics for making decisions under uncertainty. While there is a large body of theoretical work on the financial and behavioral economic bases for neoclassical investment theory (NCIT) and real options (Dixit and Pindyk, 1994; McMullen and Shepherd, 2006; Wennberg, Folta, and Delmar, 2006; Lee, Peng, and Barney, 2007), there is very little detail on how affordable loss works, little clarity about the behavioral assumptions upon which it is based, and few particulars about how this concept relates to these other approaches. Most importantly, as it currently stands, affordable loss is little more than an observed heuristic induced from studies of entrepreneurial expertise. It is not yet theoretically situated in either financial or behavioral economics. This article attempts to address this gap by explicitly relating the heuristic to existing results from behavioral economics.<sup>2</sup> In other words, to take preliminary steps to address the research question of how a behavioral economic perspective theoretically can deepen our understanding of the empirically induced decision heuristic of affordable loss. The *plunge decision* of the entrepreneur provides a uniquely appropriate context for deriving these theoretically meaningful relationships.

This article makes two key contributions to scholars of strategic entrepreneurship. First, we hope to expand the theoretically informed and practically useful toolbox available to decision makers under uncertainty. Second, we hope to contribute to the exciting new conversation about a more *creative* view of entrepreneurship and the market process, as fostered by this journal.

After a brief literature review on the making and finding of entrepreneurial opportunities and the risk-taking rationalities they entail, we briefly summarize the empirical basis for the use of affordable loss by expert entrepreneurs. We begin the section entitled *Behavioral Aspects of Affordable Loss* with an

outline of the key features of the affordable loss heuristic in comparison with NCIT and real options, and then delve into the behavioral aspects of the *plunge decision* using affordable loss. Thereafter, we discuss the implications of affordable loss for the frequency of start-up activity, the cost of failed starts, and the efficiency of new ventures that grow.

## MAKING AS WELL AS FINDING ENTREPRENEURIAL OPPORTUNITIES

### Going beyond a *discovery view* of entrepreneurship

It is perhaps not an accident that the very first article in the special launch issue of the *Strategic Entrepreneurship Journal* outlines the alternative possibilities of studying entrepreneurship as an engine of making, and not merely one of discovery (Alvarez and Barney, 2007). Several other articles pick up on this theme in a variety of ways as well. Even traditional sociological approaches were pushed beyond the deterministic influences of existing social networks to the formation of new networks (Aldrich and Kim, 2007). And Baron (2007) emphasized the *active* element in new venture creation, even while emphasizing the role of well-trodden relationships between automated cognitive processes resulting in recognition of opportunities already fully formed and *out there* in the environment.

Of particular note is Miller's (2007) exposition of risk and rationality that offers a *contingent* perspective on risk and rationality. His starting point is prior descriptions of the entrepreneurial process as a function of a set of three possibilities—opportunity recognition, opportunity discovery, and opportunity creation (Littlechild, 1986; Buchanan and Vanberg, 1991; Sarasvathy et al., 2003). Miller argues that these three descriptions imply conceptions of risk and rationality that are process contingent because the different descriptions involve unique sources of risk that, in turn, require different rational responses.

This framework leads Miller to argue that conventional interpretations of risk-taking behaviors (e.g., as maximizing expected utility) may be unique, historically situated frames or paradigms that may be stifling broader thinking about risk and rationality. Instead, 'there may be alternative ways of understanding entrepreneurship that call for other

<sup>2</sup>We leave explication of links to financial economics to future endeavors. For a bare-bones beginning in this direction, see Sarasvathy (2008).

perspectives on risk and rationality' (Miller, 2007: 60). Entrepreneurs may not be strictly bound to a single form of rationality: instead, they may display a practical, situational rationality that involves *switching cognitive gears* to adapt their decision-making style to the exigencies of their situation.

### Three views of the entrepreneurial process

These situations can be differentiated according to three conceptions of the entrepreneurial process that contain within them different assumptions about the knowledge (ignorance) of decision makers with regard to the future.

#### Recognition

The view of entrepreneurship as an opportunity recognition process involves matching sources of supply and demand that pre-exist and bringing them together through an existing firm or a new firm (Sarasvathy *et al.*, 2003). The conception of risk in this process is based on unpredictability: possible future states are, in principle, knowable, but in the absence of complete knowledge, individuals are forced to rely on their own limited information, on which they form subjective probability estimates (Miller, 2007). Rationality, herein, consists of maximizing the subjective expected utility of the entrepreneur.

#### Discovery

Entrepreneurship as a process of opportunity discovery involves a different conceptualization of risk and rationality. In this view, either demand or supply exists, but not both. Therefore, entrepreneurial opportunities involve the search for and discovery of the nonexistent side of a market transaction (Sarasvathy *et al.*, 2003). In this view of entrepreneurship, risk arises because of the unknowable character of search processes, which raises the possibility that the entrepreneur may be truly surprised by what he/she finds (Miller, 2007). Rationality, herein, consists of managing the search process in a satisfactory fashion, i.e., setting appropriate aspiration levels, exploring efficiently, and learning from experience.

#### Creative

Entrepreneurship as a process of opportunity creation supposes that neither demand nor supply exists in an obvious fashion and that both, therefore, must be created by entrepreneurial interventions in the marketplace (Sarasvathy *et al.*, 2003:). A distinguishing feature of this view of opportunity is that entrepreneurs have a causal role in establishing opportunities. In this conceptualization, risk is a product of uncontrollability: it is the freedom of other agents to act creatively in the marketplace that exposes the entrepreneur to the risk of downside losses. According to Miller (2007: 58), 'entrepreneurship as a process of opportunity creation raises some questions that challenge the mainstream conceptualizations of risk and rationality.' Rational decision making in the context of such risks may involve limiting entrepreneurial investments to affordable losses (Miller, 2007).

#### Risk and rationality in the creative view

In every context of uncertainty, paying attention to downside possibilities is essential to making good decisions. Even in the case of high-potential opportunities—such as those involving defensible patents in healthcare and technology—there is always a chance things will not work out. Hence, we deduct our investment in the venture (which equals the cost of failure, should failure occur) from our calculations of expected return. Moreover, we might try to limit the downside by spreading investment over several projects (portfolio diversification) or by staging the actual deployment of funds (real options logic).

However, in the case of the creative process, the very existence of the upside may be in doubt. Take the case of the absurdly unlikely venture 1–800-AUTOPSY. Until 1988, the world got along without the services of a company providing autopsies on demand. With the growing success and increasing demand for the company's services over the last two decades, one could argue *ex post* that there was latent demand that simply went unnoticed until Vidal Herrera recognized the opportunity with the unerring eye of the attentive entrepreneur. But what would his elevator pitch have been in 1988? Or for that matter, that of Starbucks in 1980, when according to reliable historical accounts, coffee consumption in the U.S. had been steadily declining for 20 years (Koehn, 2001). Common sense suggests that while we might

be able to calculate what we would lose in such ventures—namely all that one chooses to invest, as Knight (1921) argued—we cannot normatively prescribe what we *ought* to invest because the upside is virtually unknowable. And if we make the decision in comparison with other opportunities that offer more predictable upsides, the creative project will always be discarded under any rational metric.

It is within this context of entrepreneurship as a creative process that we begin to consider how individuals decide what they are willing to lose (i.e., their affordable loss) in order to take the plunge into entrepreneurship. The fundamental asymmetry between the calculability of losses and the unpredictability of gains both fuels the creative process and is an outcome of it. According to literature focused on this problem, human imagination and freedom of action are the fundamental features of creative market processes (Buchanan and Vanberg, 1991; Littlechild, 1986; Shackle, 1979). This creative initiative makes the future indeterminate and, therefore, suspends the logic of consequential reasoning (March, 1994). Expectations about the future, though not beyond conjecture, are frequently flawed not only because historical data either do not exist in this space or tend to point in multiple directions in equivocal fashion, but also because of the limits of anticipating how one's own actions will interact with those of other actors in the marketplace. In such cases, how then do we characterize risk and its appropriate (rational) response? Clearly, the standard calculus of optimizing risk/return has significant drawbacks. Modified versions of risk/return that involve min-max reasoning or the application of real options is also of limited applicability owing to the meaninglessness of estimated payoffs. Instead, the central concern of the entrepreneur is with the hazard of downside loss, i.e., the possibility of losses and the decision maker's aversion to loss (Kahneman and Tversky, 1979; March and Shapira, 1987; Miller and Leiblein, 1996; Miller and Reuer, 1996; Sortino and Satchell, 2001; Sortino and van der Meer, 1991; Thaler *et al.*, 1997).

### Miller's suggested bases for managing risk in the creative space

Miller (2007) suggests three possible solution spaces for how entrepreneurs may deal with risk in the opportunity creative space, each of which is relevant to our exposition of affordable loss in the next section.

### Identity

In the less than fully specified creative context, looking inwards to one's own identity (rather than outwards to the environment) may provide an important guide for entrepreneurial action. As Sarasvathy and Dew (2005a) showed, entrepreneurs often explain their actions and decisions in terms of their identities, rather than their preferences or interests. It serves them well to have a strong sense of identity (who we are rather than what we want) and of process (how to make decisions rather than what decisions to make) when outcomes are highly unpredictable. This is a case of *procedural* rather than *substantive* rationality (Simon, 1976).

### Values and preferences

Eminent scholars such as Sen (2003) have argued that rationality includes critical reflection on one's own values and preferences, not just maximizing choices based on them. Here again, who the entrepreneur is plays an important role by allowing him/her to manage preference conflicts, experiment with newly acquired preferences and even construct new ones. Rationality is, thus, a dynamic outcome of preference processing by individuals.

### Emotions

As Miller points out, noncognitive aspects of risk taking have been largely neglected in the literature on risk perception. Yet, practitioners often remark that the emotional aspects of risky decisions—how they *feel* about the risks—is highly influential in their decision processes. Moreover, recent empirical evidence suggests that emotional responses to risk are better predictors of behavior than cognitive assessments (Loewenstein *et al.*, 2001).

In sum, Miller's overriding claim is that entrepreneurs who exhibit skillful performances may do so by operating according to more than one approach to risk and rationality. They may operate according to plural rationalities—by applying decision-making techniques contingent on their perceptions of their situation at hand. Their choices about which decision technologies to apply are probably not arbitrary, but are acquired through practical experience and are largely tacit, i.e., invoked automatically based on pattern recognition (Miller, 2007). This implies that cognitive studies of expert entrepreneurs may help reveal this practical, tacit rationality and help

understand how it works (Baron and Ensley, 2006; Sarasvathy, 2008).

### The empirical basis for affordable loss

Evidence is beginning to accumulate on the use of effectual logic—including the affordable loss heuristic—and an outline of its impact on performance is beginning to emerge. The original evidence collected by Sarasvathy (1998 and 2001a) using a representative sample of expert entrepreneurs has since been replicated and compared with novices and experienced managers, and also studied in the context of private equity investing and through a meta-analysis of previously published work on entrepreneurial performance. Dew *et al.* (2009) delineate the differences between novices and experts in the use of the logic overall, and Read *et al.* (2009) investigate applications to marketing decisions with additional data from experienced managers. Results indicate that expert entrepreneurs were significantly more likely to pay attention to downside risk and use affordable loss heuristics than either the novices or the managers. Read, Song, and Smit (2009) could find only four studies that had measures they could relate to affordable loss, so they failed to find a significant relationship with new venture performance. However, their meta-analytic study of 35 articles totaling investigations of 9,897 ventures did support a positive relationship between three of the effectuation principles and new venture performance. Another study using a scenario survey method examined angel investors in their use of prediction-oriented (as opposed to control-oriented) strategies, the latter including affordable loss strategies (Wiltbank *et al.*, 2009). Results showed that prediction-oriented angels made significantly larger venture investments, while those who emphasized nonpredictive strategies, such as affordable loss, experienced a significantly lower number of investment failures without a reduction in the number of successes overall.

Given that *expert* entrepreneurs have a demonstrated preference for nonpredictive strategies, such as affordable loss, and because this preference has been acquired as part of their expertise-development process, it may be significantly related to positive new venture performance. Therefore, it would be useful to understand in more depth how *all* entrepreneurs can use affordable loss as part of their new venture decision-making toolbox and what that may imply for entrepreneurial performance at meso- and

macrolevels of analysis. That is the task we take up in the rest of this article. We address the former through the discipline of behavioral economics and the latter as a derived model of performance.

## BEHAVIORAL ASPECTS OF AFFORDABLE LOSS

Before we consider the behavioral aspects of affordable loss, it may be useful to outline its main features and compare them with those relevant to more familiar decision tools, such as NPV and real options.

### Overlaps and differences between NPV, real options, and affordable loss

We would like to begin by noting that there exist both overlaps and differences between affordable loss and the other two approaches.<sup>3</sup> As Miller (2007) argued so well, the key to decision making in the creative setting is that entrepreneurs can use multiple rationalities contingent upon the particularities of their identity and venture ideas. Moreover, they can (and should) draw from an extended toolbox of strategies that include everything from NPV, min-max, and real options to affordable loss, integrative negotiation, leveraging slack, and even gut feel and intuition. Yet the differences are worth emphasizing simply because they make a difference—both in how entrepreneurs perceive problems and in how they tackle them. And differences in their choices also lead to differences in outcomes, whether at their own or more macrolevels.

The most fundamental difference, of course, is that affordable loss is firmly grounded in behavioral theory (bounded cognition and psychology) about human reasoning, whereas neoclassical investment theory (expected returns) and real options theory are based on the expected utility model that behavioral economists continually inveigh against. This means the theories are substantially different in terms of their description of the reasoning process itself. It also means these differences, and the consequences implied by them, are empirically testable using standard behavioral economic methods such as experiments.

One could investigate the descriptive accuracy of the affordable loss model in comparison with real

<sup>3</sup> Again, we thank our alert, though anonymous, reviewers for pressing us on this point.

options reasoning. In the previous section, we provided relevant empirical evidence that shows the prevalence of affordable loss in expert entrepreneurial decision making. With regard to the use of real options in strategic management in large corporations, a recent survey of accumulated evidence concludes that even if real options has succeeded as a way of thinking, ‘the extent of acceptance and application of real options today has probably not lived up to expectations created in the mid- to late-1990s’ (Triantis, 2005: 8). While there are several published theoretical papers concerning real options thinking in entrepreneurship, empirical evidence is rather sparse, and what does exist appears to be un-supportive of any actual use of real options by entrepreneurs—especially in terms of the upside potential of opportunities. A recent study that used data from a large longitudinal study of entrepreneurship in the knowledge-intensive sector between 1989 and 2002,<sup>4</sup> concludes:

‘Our study informs real options theory because while the theory emphasizes the dynamic nature of financial investment decisions, actually very few studies fully test this assumption on individual human decision makers. However, our study was not able to prove that entrepreneurs independent of the entry choice make complicated judgments taking into account dueling option and mixed effects of irreversibility and uncertainty. One explanation is that our irreversibility measures are highly imperfect. If not so, the main goal for entrepreneurs in this study seems to be to minimize possible losses—using the option to defer—but they are not considering growth options. This is in line with previous work made on nascent entrepreneurs in Sweden and in other countries that shows the same pattern: most entrepreneurs do not at all consider growth as an option early in the new venture formation process (Delmar and Davidsson, 2000). They are too focused to get the venture operational and to gather information about the basic viability of their opportunity’ (Wennberg, Folta, and Delmar, 2006).

One explanation for this is that authentic real options analyses are performed rather infrequently

<sup>4</sup>The study was provided by Statistics Sweden and covered more than 3,300,000 individuals, representing more than 70 percent of the active Swedish active labor market.

by entrepreneurs. Perhaps this is because the information requirements of the theory are very high for all but the most simple of problems, the formal calculations required are substantially more complex than the heuristic version of the theory, and dueling options frequently compete with one another in decision problems (Folta and O’Brien, 2004). The theory, therefore, runs into problems of financial literacy and data constraints. By comparison, affordable loss is information *light* and computationally simple.

The affordable loss heuristic involves decision makers estimating what they might be able to put at risk and examining what they are willing to lose in order to follow a particular course of action. In principle, affordable loss might be used at all levels of analysis—individual, firm, economy, etc.—and in a wide variety of contexts, such as new product development, new policy initiatives, the building of new institutions and, of course, new venture start-up decisions. However, the *plunge* decision of the individual entrepreneur provides a quintessential illustration of the affordable loss principle and is the focus of the exposition in this article.

Take the case of an entrepreneur who is considering quitting employment in order to start a firm.<sup>5</sup> Classic risk-return analysis suggests some market research and competitive analysis should be done to estimate the potential risk and return to the venture before deciding whether or not to take the plunge. The entrepreneur’s musings might go as follows: ‘I estimate that I need \$2 million to start this venture, and I hope to break even in two years. I can put in \$250,000, so I need to raise \$1.75 million before I can take the plunge—even without taking into account the opportunity costs of forgoing two years’ salary.’

Considered this way, taking the plunge is a matter of predicting parameters as accurately as possible in order to make a good decision.

In contrast, affordable loss suggests that entrepreneurs set an upper bound on what they are willing to lose in order to start the venture. This entrepreneur might think ‘I have always wanted to be my own boss. I think I can afford to take two years and invest my \$250,000 to try this out. In the worst case

<sup>5</sup>Some empirical data indicates that most new firms are started on a part-time basis (Wennberg, Folta, and Delmar, 2006). Thus, the plunge decision may, in fact, occur in stages. Plunging in stages does not materially alter the analysis we present here and, therefore, for expository convenience, we focus on a one-time plunge decision.

scenario, I will lose the money and be back on the job market in two years.'

In this case, taking the plunge involves designing a venture using what the entrepreneur has and what others may eventually provide. This may or may not include additional funding of \$1.75 million.

This approach to the plunge decision entails individuals judging what they are willing to lose in order to take the plunge into entrepreneurship. This involves assessing what means are available to them and precommitting to how much they are willing to lose. Sarasvathy (2001a: 250) uses the concept of affordable loss as a criterion for selecting between effects in effectuation, referring to 'a predetermined level of affordable loss or acceptable risk.' In turn, these insights build on Sarasvathy, Simon, and Lave (1998), where the decision processes of entrepreneurs and bankers were examined. In that study, entrepreneurs were found to pick a level of risk they felt comfortable with and then focus on manipulating returns. The economist George Shackle (1966) also refers to the term in an early paper, where he postulates that the entrepreneur might characterize each venture opportunity according to the possible gains and losses, and suggests affordable loss is used in the evaluation of which venture opportunity an entrepreneur might pursue.

'It is practical and reasonable to regard the focus-loss, in absolute terms, as depending on the nature and scale of the enterprise concerned. Thus, by choice of an appropriate kind, or an appropriate size, of plant or enterprise, he can adjust the greatest amount he stands to lose, that is, his focus loss, to the amount which, given the size and character of his assets, he can afford to lose' (Shackle, 1966: 765).

Our starting point for analyzing the use of affordable loss by potential entrepreneurs is the observation that information about the potential downside of a venture is more salient to the decision maker than information about the potential upside of the venture. Salience refers to the distinctiveness and prominence of information (Mehta, Starmer, and Sugden, 1994). Information that is more salient grabs the attention of decision makers. The salience of information may be the result of a number of different cognitive factors that lead particular information to be perceived as standing out, suggesting itself, or just seeming obvious or natural to notice (Schelling, 1960; Mitchell *et al.*, 2004). While

(normative) expected returns reasoning is agnostic about the salience of upsides and downsides (and, therefore, weights both upside and downside information equally in computing a choice), affordable loss reasoning involves decision makers attending unequally to the downside information about the decision because it is more salient as a decision criterion. Downside information is, therefore, overweighted as a choice criterion by comparison to the (normative) expected returns model.

Why is information about the downside more salient than information about the upside when it comes to launching a venture? The difference may occur because of perceived differences in the nature and source of the information used in such calculations. To calculate the upside case for a venture, the entrepreneur has to estimate future revenues, costs, and possible risks that influence the cost of capital for a venture. This involves looking outward to collect information about the environment—customer preferences, supplier costs, competitor activities, financing alternatives, etc. Almost all of the information required for such calculations is exogenous—about things that are for the moment outside the decision maker's control—almost entirely dependent on the effect to be created, and largely reliant upon predictive information, such as estimates and expectations. Typically, this information is translated into net present value/discounted cash flow models.

Entrepreneurs may have good reasons for underweighting this information in the plunge decision. While the upside potential of a venture is critical in motivating the plunge decision, entrepreneurs may still underweight upside potential as a salient decision criterion for two reasons. First, from an information processing perspective (Simon, 1978), underweighting may occur because exogenous information is regarded as too fuzzy, noisy, and unreliable to drive the choice process. Some empirical evidence supports this assertion. Studies of venture investors (such as venture capitalists) focus on management quality and deemphasize business plans, indicating that professional investors tend to treat financial estimations rather skeptically (Gompers *et al.*, 2006). A survey of Inc. 500 founders asked whether they had written formal business plans before they launched their companies and found 'only 40 percent said yes. Of those, 65 percent said they had strayed significantly from their original conception, adapting their plans as they went along. In a similar vein, only 12 percent of this year's Inc.

500 group said they'd done formal market research before starting their companies' (Bartlett, 2002: 63). Other studies have documented that expert entrepreneurs clearly reject predictive data on market opportunities, such as market research on new product ideas (Dew et al., 2009).

A second reason why entrepreneurs may underweight upside potential is overconfidence and over-optimism (Camerer and Lovallo, 1999; Cassar, 2008; Casson, 2005). In this case, an entrepreneur's optimism that their venture will be a *homerun* success negates the discriminating value of carefully calculating expected returns, since all upside scenarios are assumed to dwarf the initial investments needed to start the venture. Again, from an information processing perspective this actually reduces the salience of upside data in the plunge decision.

By contrast, information about the potential downside to launching a venture is often rather concrete and highly salient to potential entrepreneurs. To calculate affordable loss, all of the information entrepreneur needs to know is endogenous—their current financial condition and a psychological estimate of their commitment in terms of the worst case scenario. Instead of looking outward for information in order to decide how much money to commit to a new venture, entrepreneurs look inward to assess the means available for starting the proposed venture and to estimate how much they are willing to lose. The estimate of affordable loss does not depend on the venture, but varies from entrepreneur to entrepreneur and even across his/her life stages and circumstances. Because this information is about the entrepreneur's own life, current commitments, and aspirations, it involves trade-offs between subjective risks and values over which the entrepreneur can assert some control. Owing to its relative concreteness, controllability, and the specter of loss, potential entrepreneurs may use the worst case scenario as a focal point for the plunge decision and pay a great deal of attention to it as a discriminating decision criterion (Sarasvathy, 1998).

Thus, consistent with bounded rationality, affordable loss involves using a smaller information set than is required in (normative) expected returns reasoning. By allowing estimates of affordable loss to drive their decisions about which venture they start, entrepreneurs focus on information that is more salient in determining their final choice, and they put aside less salient information that does not determine the decision. Again, this does not negate the motivating effect of the upside potential of a venture:

our intention is not to minimize the importance of this factor (financial or otherwise, articulated or not). We merely stress that upside data is usually not discriminating and reliable enough to be the key decision criterion that triggers an entrepreneur to take the plunge.

We summarize these differences in Figure 1 below:

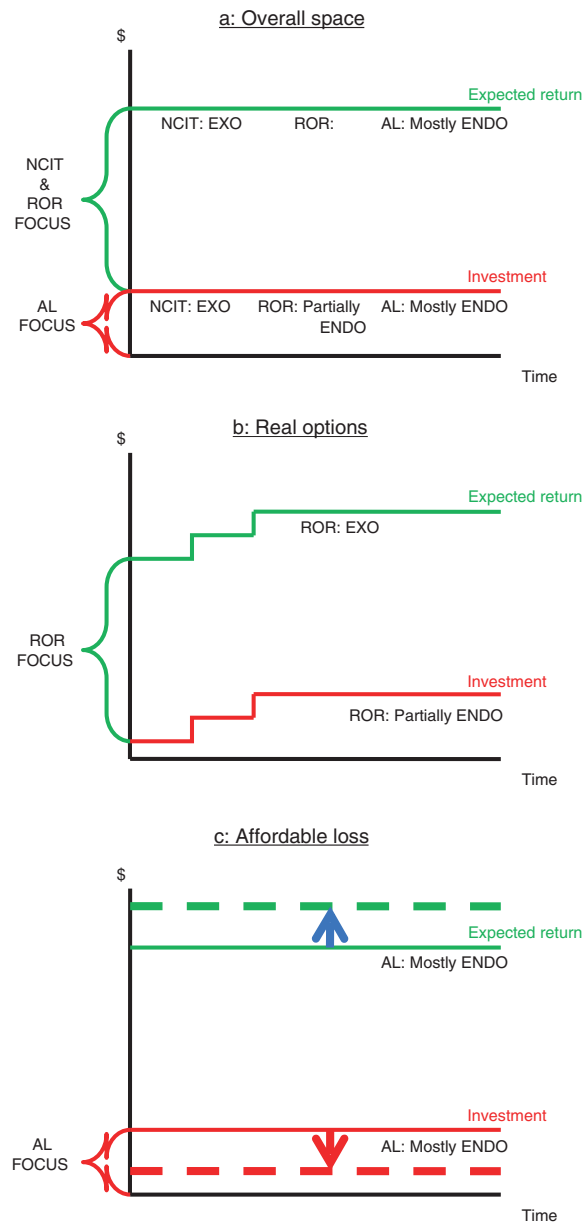


Figure 1. Differences in the theoretical models guiding investment in new ventures



Figure 1a is a simplification of the overall argument, made more nuanced through Figures 1b and 1c. While both neoclassical investment theory (NCIT) and real options reasoning (ROR) treat expected returns and investments as exogenous to the decision maker with the plunge decision determined by the difference between the two (compared to opportunity costs), affordable loss reasoning focuses on the (endogenous) investment amount, with the plunge decision determined by the entrepreneur's willingness to lose this amount.

The necessity to take environmental endogeneity more seriously has been emphasized by Adner and Levinthal (2004) in their recent critique of ROR. They argue that such endogeneity is precisely what characterizes strategically interesting settings, where, 'having made an initial investment, firms can actively engage in follow-on activities that can influence outcomes and identify new possible actions and goals' (Adner and Levinthal, 2004: 120). They distinguish this situation from the exogenous opportunity set typically posited in real options and expected value reasoning where the assumption is that 'the nature and quality of options are independent of the firms' interim activities. The implicit imagery both in NCIT and ROR is of a firm 'buying a ticket' to engage in some prespecified opportunity set' (Adner and Levinthal, 2004: 120). This ignores the role of agency in shaping and molding initiatives and possibilities.

Interestingly, in an empirical study that found evidence that supports predictions from a real options perspective, O'Brien, Folta, and Johnson (2003: 526) concluded that 'furthermore, whether or not they are versed in the formality of real options theory, it appears that most entrepreneurs astutely evaluate their concerns over uncertainty with respect to the degree of irreversibility associated with their investment. As noted in the introduction, the real options literature has been lacking in empirical demonstrations of the theoretical interaction between uncertainty and irreversibility. Our results are unique in that they indicate that the degree of irreversibility associated with a new venture can be influenced by the nature of the industry being entered, the location selected, and even the characteristics of the entrepreneur.'

This result is consistent with an effectual use of the affordable loss heuristic that does not preclude the possibility that entrepreneurs can mold, shape, transform, and reconstitute current realities—including their own limited resources—into new

opportunities. Both the upside and downside of a venturing opportunity are taken to be endogenous. On the downside, entrepreneurs using affordable loss reasoning may attempt numerous ways of lowering their resource investment in a new venture. At the limit, some ventures may be launched with zero resources. Entrepreneurs are motivated to do this both by a combination of risk acceptance and loss avoidance, i.e., accepting risk as inevitable and then striving to minimize their downside loss. They may also be motivated by their skepticism about the information needed to make an upside case for the venture, which they may treat as endogenous to their own efforts. So, instead of making a calculated bet on an exogenously given upside, they seek out as many ways as possible to increase the potential returns of the venture by actively trying to make the scenario better. We present a simple illustration of these arguments in Figure 1c, with a comparison to real options—per Adner and Levinthal's (2004) arguments—in Figure 1b.

We now turn to building a theoretical basis for affordable loss rooted in insights from behavioral economics. We begin by breaking up the decision space into three parts: (1) the preference for taking the plunge; (2) the ability to take the plunge; and (3) the depth of the plunge.

### **Behavioral aspects of the preference for taking the plunge**

One of the interesting issues regarding the plunge decision has always been whether the motivation to become an entrepreneur is largely psychological or subject to real influence by financial incentives. Motivation may have to do with any number of things including upside potential, psychological reasons (such as the desire for independence) and socioeconomic factors (such as downsizing, power-distance, being an immigrant, and so on) (Swedberg, 2000). The likelihood of actually acting upon any of these motivations, however, would have to take into account things like the degree and intensity of motivation (willingness to lose any given sum) and resolution of conflicts in financial and nonfinancial motivation (risking independence versus risking security for example), where reducing the level of one below a threshold might make the conflict disappear and make the plunge more affordable.

Most developmental economists and policymakers appear to assume that the motivation to plunge depends upon societal and economic incentives to

do so. Hence, the endless streams of seed capital programs and culture-related incentives (such as peer lending) increases the number of people starting new ventures. Research on psychological factors of motivation is also interesting—arguing for a variety of nonfinancial motivators (Baum, Locke, and Smith, 2001; Gimeno *et al.*, 1997) that are presumably intrinsic to the entrepreneur and not easily amenable to change through external incentives. Yet considerable recent evidence from psychology and behavioral economics suggests that preferences do change over time and that they may even be constructed at times, for example, through the very process of researchers trying to elicit them in the course of their investigations. As Paul Slovic (1995: 365) stated in his address to the American Psychological Association entitled *The construction of preference*:

‘The meaning of preference and the status of value may be illuminated by this well-known exchange between three baseball umpires. ‘I call them as I see them,’ said the first. ‘I call them as they are,’ claimed the second. The third disagreed. ‘They ain’t nothing till I call them,’ argues the third.’

Affordable loss tends to call them in the sense that it disconnects objective (exogenously given) performance probabilities and resource requirements from the actual act of plunging. Thus, it allows potential entrepreneurs to construct their preference for taking the plunge even when their motivations are ambiguous and so-called rational decision criteria argue against taking the plunge. The statistics of new venture success and failure argue that any rational calculation based on expected return ought to bias the decision against plunging, simply because of the large failure rate. In fact, it would take either a very large potential for gain or a high level of risk-tolerance to overcome the failure rate. However, affordable loss lessens the impact of possible failure because it makes failure clearly survivable by constraining the loss to something that the entrepreneur regards as affordable and is willing to lose in order to pursue the venture (the venture is considered worth doing *even if* the invested amount is lost). This increases the likelihood of plunging irrespective of the motivation to enter into entrepreneurship. There are at least four ways that the use of affordable loss as a decision heuristic increases the probability of entry into entrepreneurship: (1) it reduces the

threshold of financial risk taking required; (2) it allows potential entrepreneurs to focus on things within their control and proceed in spite of things outside their control, thereby increasing both confidence and creativity; (3) it makes explicit the fact that the upside is at least partly, maybe even largely, endogenous to their own actions and those of their stakeholders; and (4) it enables potential entrepreneurs to choose projects that matter to them in ways beyond the economic upside. Thus, even if the financial upside is what decides the particular set of venture ideas they are considering (i.e., elements of the choice set), factors beyond the financial upside (it is worth it *even if* I lose my investment in it) shape the actual decision of which venture ideas to act on (i.e., provide choice criteria).

By reducing the financial constraints, affordable loss increases the set of potential entrepreneurs who can afford to take the plunge. And if a person is already highly motivated to become an entrepreneur, by endogenizing the upside, affordable loss increases the probability he/she finds something worth plunging into. The former are provided with more reasons for saying yes and the latter with more reasons for saying no to taking the plunge.

Thus, affordable loss reasoning is a biased mechanism for taking the plunge. It increases an individual’s probability of entering into entrepreneurship *even if* the failure rate is high and *irrespective of* exact motivations, financial or otherwise (as compared to expected returns and real options reasoning). Stated as a proposition:

**Proposition 1:** *An entrepreneur using affordable loss reasoning will be more likely to take the plunge than one using either expected returns or real options reasoning.*

### **Behavioral aspects of the ability to take the plunge**

Behavioral economics offers insights not only about the willingness of people to take the plunge, but also about their ability to do so, given that they do want to become entrepreneurs. For example, how do people decide which resources are framed as affordable to lose or not? On the one hand, it might be possible to draw up an objective estimate of the decision maker’s current financial condition, i.e., a personal balance sheet. On the other hand, we need to understand why some things get *mentally accounted for* or categorized as *losable* and other

things do not. This problem looks like a classic mental accounting problem applied to the plunge decision of the entrepreneur (Thaler, 1999). Let us examine what the literature on mental accounting can tell us about moving toward a rigorous understanding of this particular aspect of the affordable loss principle.

The notion of mental accounting was first developed in a paper by Thaler (1985) and later summarized by him (Thaler, 1999). Mental accounting emerges fairly straightforwardly from bounded rationality: creatures with limited cognitive processing capabilities require ways of keeping track of their money with limited memory space. Thayer theorized that people categorize resources in order to keep track of them, much like accountants do in firms. For example, they create separate mental compartments for long-term savings (such as that for retirement and children's education) and others for short-term expenses (such as entertainment and leisure activities).

A key implication of mental accounting is the violation of the fungibility premise of economics, i.e., that resources are automatically arbitrated across different accounts (Thaler, 1999). A simple way to think about this is that for Homo Economicus, money by any other name is still money, but for most Homo Sapiens, money in one mental account is just simply not the same as money in another account. Because of this nonfungibility characteristic, mental accounting suggests that consumers may borrow at high interest rates in some accounts even while they save at much lower interest rates in others. Similarly, some resources may be mentally accounted for in accounts that the entrepreneur will not put at risk, whereas other resources are accounted for in accounts that are available for risky investing in entrepreneurship. Just as the accounting of spending behavior affects how consumers spend (Prelec and Loewenstein, 1998), the accounting of resources by entrepreneurs may affect how entrepreneurs make the plunge decision.

Take, for example, the impact of windfalls—such as inheritances—on the plunge decision. A famous example of this is Fred Smith investing his \$2 million inheritance (as well as his sister's \$2 million) to start FedEx. Prior research has found that individuals who receive an inheritance are significantly more likely to enter entrepreneurship than individuals who do not receive an inheritance (Holtz-Eakin, Joulfaian, and Rosen, 1994). However, the explanation for this finding is debatable. From a cognitive perspective,

inheritances should make no difference to how a person reasons through the decision to become an entrepreneur. This has led some researchers to conclude that would-be entrepreneurs must be liquidity constrained, but inheritances lift this constraint and, hence, enable entry into entrepreneurship. However, Cressy (1996: 1253) subsequently showed this was not the case, pointing out that 'a reason why others have seemingly identified start-up debt-gaps may be the failure to test a sufficiently rich empirical model.'

Affordable loss provides an alternative explanation for these empirical results: windfalls change what the potential entrepreneur accounts for as *losable*; they increase the entrepreneur's mental budget of affordable loss. This is because inheritances are more likely to be accounted for as *house money* and, therefore, they are more freely available for *betting*, i.e., that inheritances are mentally accounted for as funds available for risky investing in entrepreneurship (Thaler and Johnson, 1990; Weber and Zuchel, 2003). This suggests that windfalls will have a larger impact on the likelihood of plunging than the same amount of money accumulated through savings, for instance. Thus, windfalls have a positive impact on start-up activity because of the effect they have on the entrepreneur's calculation of affordable loss, not directly because they lift liquidity constraints.<sup>6</sup> Other examples of such windfalls are stock options, lottery winnings (Lindh and Ohlsson, 1996), and unexpected increases in asset prices (property prices, for example).

On the other side of the mental ledger are resources that are accounted as being unavailable for spending on entrepreneurship. Thaler (1990) suggests that agents may use prudential heuristics, i.e., rules of thumb that preclude borrowing against or spending certain resources. For example, individuals may have rules that preclude borrowing against certain accounts that are mentally accounted for as belonging to other parts of their life (for example, funds set aside for retirement, such as 401K, pension, etc.) or mentally accounted for as belonging to others (such

<sup>6</sup>This conjecture could be tested through a market entry game-theoretic experiment where two randomly selected groups of subjects are asked to decide how much they would invest on entry. Both would be given similar levels of resources, with one group attaining it through a windfall and the other group having saved it from their accumulated earnings. Since both have the same liquidity overall, the cognitive hypothesis would be that subjects will place similar *bets* on market entry; the behavior hypothesis would be that they will bet differently.

as children's college funds). In some instances, the home may be accounted for in a *not to be put at risk* account because dependents rely on the home.

We hypothesize that two aspects of mental accounting are generally applicable to the plunge decision in terms of affordable loss. The first is coupling. Prelec and Loewenstein (1998) have proposed that forms of payment that more closely couple payment and consumption are avoided if possible because they are more likely to call forth thoughts of payment that undermine the pleasure of consumption. Prelec and Loewenstein (1998: 4) found that 'coupling . . . refers to the degree to which consumption calls to mind thoughts of payment, and vice versa. Some financing methods, such as credit cards, tend to weaken coupling, whereas others, such as cash payment, produce tight coupling.'

In entrepreneurship, there are several well-known stories of entrepreneurs who started their businesses on their credit cards (e.g., EDS by Ross Perot and the founding of Home Depot). Because credit cards weaken the coupling between decision and payment, we expect that this will affect the way potential entrepreneurs' evaluate the costs of taking the plunge. Other examples of weak coupling may include loans from family members that have flexible or unspecified payback terms (sometimes casually referred to as spending somebody else's money). Research on family business, for example, refers to the relatives' money as *patient capital*.<sup>7</sup> The use of this money allows an entrepreneur (or family member) to continue operating in business without the heavy pressure of deadlines to repay or earn a specific return in a very short period of time (for example, see the work of Sirmon and Hitt, 2003).

Since individuals will seek the hedonic benefits of decoupling where possible, those involved in entrepreneurship will prefer to use mental accounts that more weakly couple the experience of risking resources with the decisions being made. These accounts are less painful to lose than accounts that are more strongly coupled with the plunge decision. As a result:

**Proposition 2:** *Weakly-coupled forms of payment will raise a potential entrepreneur's level of affordable loss and, therefore, increase both the likelihood of taking the plunge and the ability to take it.*

<sup>7</sup>We thank the editor for turning our attention to this important and relevant stream of research.

The second aspect of mental accounting that directly impacts the affordable loss levels leading to the plunge decision has to do with the effects of accounting in different units, i.e., time versus money (Okada and Hoch, 2004; Soman, 2002).<sup>8</sup> Because financial losses are painful, Thaler (1999: 188) states that 'we should expect to see that some of the discretion inherent in any accounting system will be used to avoid having to experience losses.'

Two qualities differentiate time and money. First, the value of time is more ambiguous than money. Second, time is perishable; it cannot be stored in inventory or saved for later use the way money can be. Third, people tend to calculate returns on time invested using nonfinancial metrics. For example, entrepreneurs such as Scott Cook, founder of Intuit, talk about celebrating failure, for they value learning from failure. These differences suggest that losses paid for in time may be experienced as more affordable than losses paid for in money because their ambiguity means they can be accounted for more flexibly.

Therefore, we might expect that the currency, in which mental accounting occurs, matters for raising levels of affordable loss for potential entrepreneurs and, thereby, increases the probability that they will actually take the plunge.<sup>9</sup> To our knowledge, the effects of mentally accounting in time has not so far been studied in an entrepreneurial setting. However, anecdotal evidence suggests that entrepreneurs may flexibly substitute time for money in the new venture setting. This is sometimes referred to as *sweat equity*. Thus, sweat equity may be a factor in the plunge decision and some proportion of entrepreneurs may subsequently *sweat it out* over longer periods of time. Because of the ambiguity and perishability of time, ventures where the investment can be easily converted into time inputs are perceived to be more affordable than ventures that require cash investments. Stated as a proposition:

<sup>8</sup>Our analysis focuses on money and time, but we recognize that individuals may have other important resources—such as reputation—that may warrant investigation from a behavioral perspective in future work.

<sup>9</sup>It is intriguing to also consider *currency* other than money and time. A nonexhaustive list could include reputation and rolodex. While we speculate that accounting in these nonfinancial currencies will also likely increase the ability to take the plunge, current research in behavioral economics does not yet address these. A deeper empirical understanding of the entrepreneurial plunge decision, we believe, can bring original insights to behavioral economics on some of these unstudied units of mental accounting.

**Proposition 3:** *When entrepreneurs account in time (versus money), they will have higher levels of affordable loss and, therefore, will be more likely to take the plunge.*

### Behavioral aspects of the depth of the plunge

The concept of affordable loss urges individuals to enter into entrepreneurship based on a loss that, even though it is only possible, is known to be affordable and that they have come to terms with before taking the plunge. Given that preferences may change over time (Ainslie, 2001; March, 1978) raises the important theoretical question of how the potential entrepreneur *secures* the plunge decision. In other words, how do entrepreneurs make the plunge work over relevant periods of time during which they may be sorely tempted to second guess themselves and quit, while at the same time ensuring their ability to quit when it would be prudent for them to do so?

When making the plunge decision effectually, the mechanism that both supports the willingness to lose an affordable set of resources and enables the quitting of the new venture at the point those resources are exhausted is the precommitment that one is willing to lose a select and finite set of resources over which one has control. For instance, if the entrepreneur says 'My affordable loss is \$200,000 and two years of my life in this venture,' then this choice rests not only on a commitment that the entrepreneur is willing to lose two years and \$200,000, but also on a commitment that after this point, the entrepreneur will indeed quit the venture, i.e., this is *all* that the entrepreneur is willing to lose.<sup>10</sup> Moreover, the commitment is based on entrepreneurs' preferences over their means, not on information in the environment that might change over time and lead them to change their minds. Thus, the commitment aspect of affordable loss is double edged: it involves the resolve that one is willing to lose certain resources, as well as a constraint that this is all one is willing to lose. Both aspects rely on some kind of commitment mechanism.

What enables human beings to make such commitments to themselves? One explanation is that emotions play an important role in serving as commitment devices that enable people to behave

consistently over time (Frank, 1988; Nesse, 2003). For a vivid description of the emotional state that sometimes accompanies the plunge decision, consider the following example drawn from Tom Fatjo's autobiography (Fatjo and Miller, 1981). Fatjo was an accountant in Houston when a meeting with the people living in his subdivision challenged him to take up the garbage collection problem the community was facing. In 1970, he borrowed \$7,000 for his first truck. Every day, Fatjo woke up at 4 a.m. to collect garbage for two hours before changing into a suit to go to work in his accounting office. He did this for over a year before he quit his day job to found the waste management giant Browning Ferris. Of course, when he made the decision to take the entrepreneurial plunge, he did not know he would end up building a \$1 billion enterprise. Here is how he describes his moment of decision:

'Within a week, I was almost frantic. My food wouldn't seem to digest and I had a big knot in my chest. When I was doing one thing, I thought of two others which had to be done that same day.

The pressure just kept building. Even though it was cold, my body was damp from continuous perspiration. Since so much of what I was doing in the accounting firm had to be done by the end of the tax year and involved important decisions with key clients, I needed to spend time thinking through problems and consulting with them as they made decisions. I was caught in a triangle of pressing demands, and I felt my throat constricting as if there were wires around my neck.

That night I was exhausted, but I couldn't sleep. As I stared at the ceiling, I fantasized all our trucks breaking down at the same time. I was trying to push each of them myself in order to get them going. My heart began beating faster in the darkness and my body was chilled. The horrible thought that we might fail almost paralyzed me.

I wanted to quit and run away. I was scared to death, very lonely, sick of the whole deal. As hard as I tried to think about my life and what was important to me, my mind was just a confused mass of muddled images . . . I remembered committing myself to make it in the garbage business *whatever it takes!* I lay back on my pillow and felt a deep sigh within myself—*Good Lord, so this is what it takes*, I thought, then rolled over and got some restless sleep.' (Fatjo and Miller, 1981: 32)

<sup>10</sup>Note that the argument would be the same even if he/she does not make an immutable decision to quit, but makes only a firm commitment to seriously consider the decision to quit.

Fatjo's decision embodies the principle of affordable loss. In his narrative of the plunge decision, Fatjo appears to be grappling with the worst case scenario and striving to come to terms with it through a commitment that explicitly divorces his decision from the possible consequences.

Yet Fatjo's narrative also illustrates the powerful emotional component of such decisions—and the dangers that accompany those emotions. It shows how the decision had the kind of felt, embodied component that Miller (2007) has urged us to recognize. Fatjo was 'damp from continuous perspiration, felt (his) throat constricting,' and 'exhausted but couldn't sleep.' Eventually, the way he silenced the muddled images was by making a commitment do *whatever it takes*. Such emotional intensity, while perhaps necessary to overcome the opportunity costs associated with giving up a highly paid white-collar job, may also induce blind fervor of the kind that leads to financial ruin. Here a precommitment to affordable loss levels can put the brakes on such a rush to ruin.

Among the emotions that act as bulwarks against breaking commitments to ourselves, guilt and shame are prominent. People readily use these feelings against themselves, i.e., people feel badly if they don't keep their promises to themselves. In effect, these emotional predispositions provide incentives to act in particular ways or serve as a tax on not behaving in certain ways (Elster, 2000). Thus, from an economic perspective, these emotions are valuable commitment-rendering devices that are directed at the self—at securing a decision you made to yourself so that you do not renege on it in the future.<sup>11</sup> These emotion-based commitments have to work with whatever stop-loss mechanisms and procedures they employ to limit their losses.

Therefore, the affordable loss heuristic provides the potential entrepreneur with the resolve to take the plunge and also the emotional back up required to quit when the time comes. This heuristic has an important side effect: it serves to protect the

<sup>11</sup>This type of self-commitment can be traced to Homer's parable about Ulysses, who had himself bound to the mast of his ship in order to resist the temptatious song of the Sirens (Elster, 2000). Essentially, in a moment when his thoughts were clear and passions were in a state of balance (a moment of reflective equilibrium/considered judgment), Ulysses decided to take precautions against future changes in his preferences. Commitment devices, then, are normally thought of as ways to protect oneself against glitches in one's judgments; the idea, then, is that commitments keep the decision maker rational over time.

entrepreneur from the well-known susceptibility to escalation of commitment bias (Staw, 1976). In conventional analyses of investment decisions, researchers have found that investors often throw good money after bad when they find projects underperforming in terms of their expectations of return (Staw, 1981). At these points of disappointment, investors begin to perceive the costs thus far incurred as sunk and so arrive at irrational decisions to invest more money in bad projects. Affordable loss provides a safeguard against this by shifting the emphasis to the downside at all times. In fact, even before one begins, affordable loss insists on a precommitment to quit when the affordable loss amount is actually lost. Unlike standard cases of escalation of commitment where the upside still reigns supreme in the decision-making process—and, therefore, the costs incurred thus far come to be seen as sunk—the focus in the case of affordable loss is always on the downside and the precommitment to quit ensures that the decision to continue is not about unending hopes of the upside, but once more thinking through whether any new investments are worth losing—in terms of nonfinancial upsides that the entrepreneur really values enough to make the new investment worthwhile. We speculate, therefore, that:

**Proposition 4:** *Entrepreneurs who make the plunge decision using the affordable loss heuristic will be less susceptible to escalation of commitment than those who use calculations of expected returns.*<sup>12</sup>

## DISCUSSION

In this section, we discuss several implications of the affordable loss heuristic that are relevant for research and public policy in entrepreneurship. These are, in turn, the frequency of venture start-up, the costs of failure, and the efficiency implications of underinvestment in entrepreneurship.

### Frequency of venture start-up

A long-standing and important research puzzle in the economics of entrepreneurship is the issue of

<sup>12</sup>Here we have deliberately limited the scope of our analysis of the emotional aspects of decision making to the issue of commitment. However, we note that a variety of propositions related to emotion could be imagined (for example, recent work on grief [Shepherd, 2003]), and we, therefore, return to this issue in our concluding remarks. We are grateful to an anonymous reviewer for drawing our attention to this point.

excess entry and suboptimal returns observed in empirical studies of entrepreneurship (Geroski, 1996; Caves, 1998). The statistics of new venture success and failure argue that any rational calculation based on expected return ought to bias decision makers *against* plunging, simply because of the large failure rate. But the fact is that this does not deter entrepreneurs from (over)entering. While studies have suggested a wide range of individual characteristics that might help explain these data, some key explanations have recently been contested in the literature. For instance, Moore and Cain (2007) significantly moderate the conclusions of Camerer and Lovo (1999) regarding overconfidence/reference group neglect; and Miner and Raju's (2004) results contest Stewart and Roth's (2001) regarding the long-standing hypothesis of preference for risk.

In our view, entry into entrepreneurship is a choice that may be supported by a variety of reasoning processes that are contingent on the exact nature of the decision problem as well as on the characteristics and circumstances of the decision maker. Some entrepreneurs may indeed be more risk loving than others. Others may exhibit over- or underconfidence and yet others may simply be ignorant of failure rates. But at least some—if not most—expert entrepreneurs use affordable loss. We have shown in this article that affordable loss is not only empirically induced, but also theoretically consistent with what we know about human information processing in general and recent findings in behavioral economics in particular.

By contrast, more formal economic models of entrepreneurial entry start from the assumption that individuals enter into entrepreneurship only when it pays to do so—i.e., only when the expected value or option value of the plunge is positive (based on data about payoffs, failure rates, and probabilities). Comparing affordable loss to heuristics that begin with exogenous expected return reveals that when individuals use the affordable loss heuristic, they may take the plunge even if the failure rate is high and irrespective of potential gain, i.e., they may take the plunge when the expected value of entering entrepreneurship is negative. Therefore, affordable loss suggests a higher entry rate than expected returns.

This prediction is important because it suggests an alternative behavioral explanation for the excess entry/poor returns puzzle. Importantly, one virtue of this explanation is that it does not depend on any cognitive mechanisms or biases that are specific to the entrepreneurial population, i.e., it does not

depend on an empirical difference between entrepreneurs and nonentrepreneurs.<sup>13</sup> Moreover, affordable loss is a heuristic for taking the plunge at any given level of liquidity, so it applies to the whole population of potential entrepreneurs regardless of heterogeneity in the initial distribution of wealth/resources. But perhaps most importantly, the affordable loss heuristic is teachable and learnable with the added benefit of low cognitive burden. Put simply, the following four steps capture the heuristic in the classroom:

- Think through what you can *afford* to lose—amounts set aside in weakly-coupled mental accounts, sudden windfalls, savings you have been setting aside for an entrepreneurial debut, etc.
- Think through how much you are *willing* to lose for the *particular* project steps you are actually planning to take—half of the above amount, for example, so you can try two projects instead of one, in case the first one fails.
- Take those steps at those levels of investment if you *feel* comfortable that those steps are worth taking *even if* you lose all your investment—i.e., think through nonmonetary benefits.
- Think creatively about how you can reduce actual cash outflows on this investment—and continually strive to drive it close to zero.

This cognitive simplicity suggests that we can supplement financial incentives for increasing the frequency of entrepreneurial start-ups with a pedagogical one, surely a claim worth investigating both from a normative policy perspective as well as from a descriptive scientific one.

### Costs of failure

The fallibility and error-prone nature of entrepreneurial efforts have been well argued in the literature (Christensen and Knudsen, 2004). This is why experienced and self-aware entrepreneurs have failure firmly in mind when they take the plunge based on affordable loss reasoning. These entrepreneurs and their stakeholders explicitly consider the costs of assembling and disassembling new ventures. The

<sup>13</sup> Though differences will emerge from differential learning opportunities, i.e., there will be differences between how adept expert entrepreneurs are at using affordable loss compared to novice entrepreneurs.

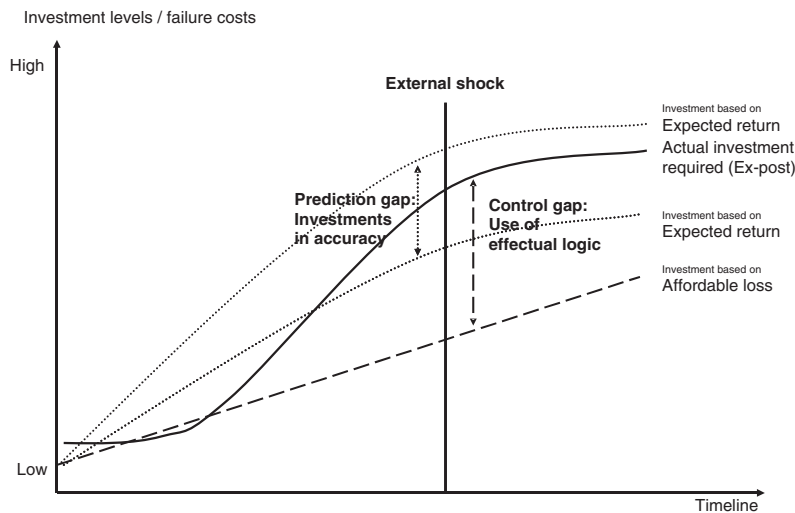


Figure 2. Firm performance: affordable loss and expected returns compared

affordable loss principle works to keep potential losses per stakeholder down (with each stakeholder individually assessing their own affordable loss) while keeping the venture open to unexpected new possibilities on the upside that may come from a variety of sources—internal, organic, market driven, exogenous, or entirely ad hoc and unpredictable.

Figure 2 presents graphically the overall argument relating the use of affordable loss as opposed to expected return to the performance of the firm. The horizontal axis on Figure 2 is time. The vertical axis measures financial investment at each point in time. Note that this is exactly the same as the amount of money lost at each point in time, should the venture fail at that time. Assume now that for any given venture that survives and grows over time, there exists an ideal level of investment required. For the purposes of this argument, we can limit this assumption to the ex post actual investment level. Figure 2 posits a generic S-curve to capture the cumulative shape of these investments over the life of the surviving venture. The S-curve is widely acknowledged to adequately capture the diffusion process in a new market (Rogers, 1995). The only leap this assumption makes is that investment required by the new venture (if it survives and grows) will follow the growth pattern of the market. Note that for our argument to hold, several other types of cumulative investment curves would work just as well.

When entrepreneurs take the plunge based on expected returns, they can make one of two types of errors: they can overinvest or underinvest. And their

investment performance in the given venture heavily depends on the accuracy of their predictions. However, when entrepreneurs plunge based on affordable loss, their investments grow as a function of survival (with incremental investments being made based on affordable loss reasoning). One consequence of this is that they would almost always underinvest in relation to the ex post actual investment curve. However, should an unpredictable or external shock occur, entrepreneurs using affordable loss are almost always likely to lose less than prediction-oriented entrepreneurs. It is in this sense that affordable loss reduces the cost of failure, irrespective of the probability of failure (Sarasvathy, 2001a).

In summary, this implication, when taken together with the implication that affordable loss leads to more frequent venture start-up, means that affordable loss results in more entry into entrepreneurship, but when failures occur, the losses are smaller. In contrast, reasoning from an expected returns (NPV) basis results in fewer entries and larger losses when failures occur. From a policy perspective, although excess entry by the wrong types of entrepreneurs may be costly, the lower costs of failure are a benefit. Overall, which alternative is normatively most desirable may depend largely on factors such as the prevailing technology regime and institutional regime (Winter, 1984; Lee, Peng, and Barney, 2007). We believe that sorting these considerations out both from micro- and macroperspectives would provide several exciting projects for future research.



### Efficiency implications of underinvestment

Several other implications follow from the hypothesis that entrepreneurs frequently (and, in a sense, deliberately) undercapitalize their ventures. First, this issue has important policy implications because liquidity constraints have often been used as an explanation for the high failure rate of new firms, i.e., firms fail because they are undercapitalized and, therefore, run into cash flow problems (Cressy, 1996). While undercapitalization might increase the risk of ruin for a firm (Baxter, 1967) it may nevertheless lower the risk of ruin of the entrepreneur (who survives to start another venture) and lower the costs of failure per venture (Sarasvathy, 2001a). Nonetheless, since firm failures are visible and measurable, many government initiatives across the globe seek to supplement the resource bases of new ventures by tax breaks or preferential financing arrangements. Second, underinvestment might also imply that firms founded by entrepreneurs who use affordable loss reasoning are more likely to miss homeruns, i.e., are less likely to capture their full upside potential (regardless of whether this is a homerun or mediocre opportunity) in markets with explosive growth and high rates of return that require large amounts of financing quickly. Here the argument is one of missed opportunity rather than outright failure.

In a recent empirical paper, Wiltbank *et al.* (2009) tests these predictions using data from a sample of angel investors (wealthy individuals who act as informal venture capitalists by placing their own money directly into early stage new ventures). Interestingly, the empirical results do not support the above predictions about failure and missed opportunities. The results of the Wiltbank *et al.* study show that angels who emphasize effectual strategies (of which affordable loss is one component) actually experienced a reduction in investment failures (not an increase) without a reduction in their number of homeruns. One possible explanation for these counterintuitive findings is that the affordable loss heuristic may tend to be used in combination with other tactics. Though financial resources are clearly very important in new ventures, they are not the only resources that are important for eventual success or failure: ventures may survive and thrive because the founding entrepreneur/s managed to find ways of supplementing the financial resources of the venture. The literature on how entrepreneurs may use social co-opting strategies to establish legitimacy and secure access to underutilized resources appears

very relevant here (Starr and McMillan, 1990; Baker and Nelson, 2005). Or entrepreneurs may use effectual strategies such as bringing on board a variety of self-selected stakeholders that help shape and grow the market organically rather than through financial investments (Sarasvathy and Dew, 2005b). Or they may attempt to substitute sweat equity for financial resources, i.e., invest large amounts of their own labor into their venture.

Finally, undercapitalization also has implications for the plurality of new venture investor types. Undercapitalization speaks to an obvious gap in most theories of the firm—property rights, resource-based view, behavioral theory, contracting, transaction cost, etc. But these theories do not explain how the firm was put together in the first place and, therefore, do not take into account the implications of the start-up situation for the efficiency of the subsequent bundle of assets or contracts that constitutes the venture (Hellmann, 2000). One hypothesis is that the appropriate reasoning approach of venture investors is contingent on the life stage of the venture. Whereas reasoning based on affordable loss may increase the likelihood of entrepreneurs taking the plunge, their use of the heuristic may limit the venture's growth potential down the road. This suggests a theoretical reason why predictive stakeholders—such as venture capitalists—may be necessary to the survival and growth of high-potential ventures. It also leads to an interesting paradox that good entrepreneurs may, under some circumstances, make bad investors for new ventures.

### CONCLUSION

We began this article with the objective of developing a deeper understanding of the affordable loss heuristic as a part of the toolbox available to individuals contemplating the entrepreneurship plunge decision. In doing so, our aim was to contribute to the exciting new conversation emerging in our field on a more *creative* view of entrepreneurship.

Interestingly, the downside focus that a behavioral economic view of affordable loss brings to the plunge decision may be used with all three views of entrepreneurial opportunities. For example, even in the case of opening a franchise for a well-established company such as McDonalds, potential franchisees can evaluate their plunge using an affordable loss heuristic. They can ask themselves not only how they can raise the initial investment required to open

the franchise, but also come to grips with worst case scenarios on what could go wrong and come up with creative ways to reduce that potential loss. Our propositions will all hold even in cases of such mundane or more readily recognizable opportunities. But in cases where opportunities are *made*, rather than found, affordable loss is particularly useful because those are precisely the cases where the upside is most unpredictable. In cases where entrepreneurs are choosing between ventures with highly unreliable but promising upsides, or in cases where they are driven largely by non-financial motives, affordable loss gives them reasoned and even systematic decision criteria *without* the necessity of spending time, money, and effort on estimating upsides—probably an exercise in fiction rather than fact or forecast in any case (Goodman, 1955).

We conclude with three departing thoughts. First, there are some important questions regarding the plunge decision. What decision-making tools should be taught to potential entrepreneurs? Should we teach them only models based on NCIT and ROR in an entrepreneurial setting, or should we also teach them how to use the affordable loss heuristic?<sup>14</sup> When is it more or less appropriate to teach each of these different decision-making tools? As Miller (2007) has suggested, with regard to risk taking, the broader issue at stake is the whole notion of what is desirable as *rational* behavior. This is a widely debated issue among philosophers, psychologists, and economists. Are decisions rational if the procedure is logical (as highlighted by Simon, 1978) or only if they express substantive rationality (in the sense of conforming to the expected utility model)? Are they rational if the outcomes are good or only if the decision input is substantively correct? In a recent article, Haselton and Nettle (2006: 63) explain that ‘many of the simple heuristics that people actually use perform just as well as complex normative models under real-world conditions of partial knowledge (Gigerenzer and Todd, 1999). There are even circumstances in which they perform better than normative models—the so-called less-is-more effect. The less-is-more effect occurs because simple heuristics can exploit structural features of the decision-making environments that are noisy and uncertain and contain multiple cues.’

Thus, human minds appear to work using a set of simple heuristic procedures and perform best when

decision problems are presented in ways that leverage natural capability by putting them in ecologically valid formats. One conjecture is that the affordable loss heuristic is possibly another example of the less-is-more and biased-is-better effects (Haselton and Nettle, 2006). It uses less information and it is biased against external information. And it may produce better results in a specific environmental context, i.e., one that is noisy, uncertain, and contains multiple cues. The implication of this argument is that we should teach students decision technologies that are adaptive (and, therefore, appropriate) across a spectrum of circumstances. This means that we might usefully teach potential entrepreneurs about both the affordable loss heuristic and the EU model as part of a package of (contingently applied) decision-making tools.

Second, we believe there is a significant opportunity to enrich research on entrepreneurial cognition with psychological research on how individuals feel about decisions, actions, and thoughts. We note much excitement among entrepreneurship researchers and some pioneering work developing on the topic of entrepreneurial cognition (Mitchell *et al.*, 2004). Researchers have also been developing ideas about the role of affect in entrepreneurship and associated areas such as creativity and innovation (Adler and Obstfeld, 2007; Goss, 2005; Shepherd, 2003). Our view is that entrepreneurship involves more than cold cognitive processes. Key entrepreneurial decisions (such as the plunge decision) are deeply personal choices that are frequently viewed as significant life choices; therefore, we should expect the entrepreneur’s feelings about these decisions to play an important role in such choices. There remains significant scope for further research on this topic—above and beyond the commitment issues we have highlighted in this article—that could help us better understand entrepreneurial behaviors, while at the same time, usefully informing pedagogy and practice.

Finally, if affordable loss plays a role in the plunge decisions of entrepreneurs, the individual’s objective function may not be directed at profit maximization. Selecting a decision strategy rooted in affordable loss fundamentally prioritizes control of downside loss above the maximization of potential upside. This is not to say that affordable loss will always result in a suboptimal result from a societal perspective or that expected return will always entail assuming more risk than affordable loss. But what it does suggest is that existing research puzzles about

<sup>14</sup>We are grateful for the comments of an anonymous reviewer who prompted us to think about this issue in more depth.

entrepreneurial wealth creation may, in part, be an artifact of theoretical perspectives that ignore crucial behavioral factors that shape the decision to start a new venture. If researchers assume profit maximization is the priority of entrepreneurs, entrepreneurial outcomes are correctly measured according to ROI, IRR, and perhaps sales revenue and sales volume. But if the entrepreneur looks to manage risk through affordable loss, the focus may be on different—and perhaps conflicting—dependent variables. Therefore, to the extent that the theory expressed in this article is empirically significant, it raises fundamental questions about the implicitly assumed risk-taking practices of entrepreneurs.

For instance, we do not know of any historical study that specifically examines the risk-taking heuristics used by well-known entrepreneurs such as the Wedgwoods, Hersheys, Edisons, Watsons, Dells, and Schultzes of the world. But we are fascinated by the possibility of what we might find were we to examine accounts of their decision processes—especially in terms of contingent relationships between their use (or lack of use) of affordable loss, risk taking, and eventual outcomes over a career of multiple entrepreneurial ventures. Edison, for example, had been on the brink of bankruptcy, and Hershey and Heinz had been through more than one. Even Wedgwood bet his entire net worth at least once in his career. Which of these were strategic (as in the case of North American Phonograph Company that allowed Edison to buy back the rights to his invention), exogenous (as in the case of Hershey's earlier ventures), and/or avoidable through the use of precommitments to affordable loss levels (as in the case of Edison's Portland Cement Company)? Thus, rethinking entrepreneurial outcomes in the context of the behavioral processes we have described in this study (such as contemplating preferences for becoming and being an entrepreneur, and exiting ventures to meet self-imposed precommitments rather than because the venture failed) has potential for significantly enriching—if somewhat complicating—our understanding of entrepreneurial wealth creation.

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