Entrepreneurs routinely demonstrate an aversion to optimization when commercializing their ideas, as indicated by a lack of planning. A large body of influential theory exists in the social sciences dedicated to explaining non-optimization, from heuristics and biases to effectuation, but this work does not provide a satisfactory rationale for why would-be entrepreneurs might engage in virtually no optimization when they otherwise could do so. This paper holds that non-optimization in the entrepreneurial context is often the result of ex ante risk, or the idea that a costly search for information about how best to commercialize an idea may result in a distribution in which the optimal outcome has a less than 50% probability of success. An outcome with such odds is unlikely to succeed or be pursued further, which would preclude recovery of the costs incurred during the search process, resulting in a loss of current resources for the entrepreneur. Prospect theory is used to show how and why the threat of this scenario may lead would-be entrepreneurs to commercialize an idea without engaging in any significant search for information about how best to do so. It concludes by proposing a method of measuring ex ante risk such that its effects on entrepreneurial behavior may be tested and further developed. The work has direct implications for effectuation (Sarasvathy, 2001; 2007) insofar as it explain why it is rational for entrepreneurs to use effectual methods in situations of risk, as well as in situations of Knightian uncertainty.
BEWARE THE WILD GOOSE CHASE: 
THE EFFECT OF EX ANTE RISK ON 
ENTREPRENEURIAL DECISION-MAKING

Entrepreneurs routinely demonstrate an aversion to optimization when commercializing their ideas, as indicated by a lack of research, due diligence and planning. A large body of influential theory exists in the social sciences dedicated to explaining non-optimization, from heuristics and biases to effectuation, but this work does not provide a satisfactory rationale for why would-be entrepreneurs might engage in virtually no optimization when they otherwise could do so. This paper holds that non-optimization in the entrepreneurial context is often the result of ex ante risk, or the idea that a costly search for information about how best to commercialize an idea may result in a distribution in which the optimal outcome has a less than 50% probability of success. An outcome with such odds is unlikely to succeed or be pursued further, which would preclude recovery of the costs incurred during the search process, resulting in a loss of current resources for the entrepreneur. Prospect theory is used to show how and why the threat of this scenario may lead would-be entrepreneurs to commercialize an idea without engaging in any significant search for information about how best to do so. It concludes by proposing a method of measuring ex ante risk such that its effects on entrepreneurial behavior may be tested and further developed. The work has direct implications for effectuation (Sarasvathy, 2001; 2007) insofar as it explain why it is rational for entrepreneurs to use effectual methods in situations of risk, as well as in situations of Knightian uncertainty.

I. Introduction

The inventor develops a technique which the innovator seeks to exploit for the creation of wealth. Innovation involves a judgmental decision whether to commit scarce resources to the application of the invention (Casson, 1982: 135).

This paper elaborates a model of decision-making under risk in the context of venture creation that is intended to treat an aspect of the entrepreneurial process that has been difficult to elucidate, namely why entrepreneurs often show an entrenched aversion to planning (cf. Sarasvathy, 2007). Following Mintzberg (1994) planning is viewed along rational choice lines as an optimizing behavior in which decision-makers search for information that will allow them to predict decision outcomes such that the optimal one may be chosen. The model that will be put forward to explain some of the non-optimizing behavior associated with a lack of planning in decision situations involving venture creation is based on the notion of so-called ex ante risk.
This kind of risk involves the potential for loss early on in the venture creation process, which is to say well before a new venture has been created and transactions have commenced. More precisely, it is the prospect of incurring losses of current resources from having engaged in a search for information about a venture whose optimal outcome turns out to be probabilistically unlikely to succeed, a prospect known in proverbial terms as a wild goose chase.

The economic actor whose decisions are the subject of this work is described herein as a ‘would-be entrepreneur’ (Bygrave, 1997). Along the lines of the quote from Casson above, and following Schumpeter (1934), this actor is someone with an idea, the equivalent of an invention, who has not yet decided to commercialize that idea. This actor is a would-be entrepreneur, where he or she would be an entrepreneur but for the information needed to turn the invention into an innovation. The specific decision under study in the paper is the one in which this actor chooses whether or not and how to pursue commercialization of their idea. Actors in this situation must choose between two or three possible options. The first is to initiate the commercialization process by engaging in a search for alternative venture outcomes, with an eye to selecting the optimal -- most profitable -- one. This is a textbook ‘make or buy’ decision in the sense that the actor is deciding which modal configuration, or collection of governance structures, is most appropriate for commercializing the idea. The wild goose chase occurs here, if the search process reveals that the best possible venture outcome has a less than 50% of chance of yielding a profit. The second option is to forego the commercialization process. The third option, not available to all, is to pursue commercialization using actionable information about a specific venture outcome that is already in hand, available at little or no cost. Using prospect theory, the paper shows why, in this third situation, it can be rational for would-be entrepreneurs to forego search, even when information about alternative venture outcomes may be available. It provides, therefore, a theory of entrepreneurial judgment; one
intended to explain how entrepreneurs decide to allocate scarce resources to the pursuit of innovation.

The paper is positioned squarely in the field of entrepreneurship, where it makes a theoretical contribution grounded in positivist economic theory to work done on planning in entrepreneurship (Gartner, Lange), effectual entrepreneurship (Sarasvathy, 2001; 2007), and more generally to work done on the role that risk and uncertainty play in the entrepreneurial process (Alvarez and Barney, 2005; McMullen and Shepherd, 2006; McKelvie et al, 2011). It fills a gap in research on planning in entrepreneurship, which has to date focused almost exclusively on the performance effects of planning rather than the extent to which planning is actually undertaken by entrepreneurs (Lange et al., 2007). It treats a theoretical gap in effectuation’s grounding in economic theory, which currently holds that effectual methods are the consequence of Knightian uncertainty, i.e. the result of not being able to plan for lack of obtainable information. The theory put forward in this paper explains in economic terms why effectual methods may also be deployed in situations of risk, where planning could occur yet does not. Lastly, while risk and uncertainty have loomed large in the study of entrepreneurship, their definition, measurement and effects in the entrepreneurial context have remained imprecise (Milliken, 1987; Schmidt, 1996; Busenitz and Barney, 1997; Alvarez and Barney, 2005; McMullen and Shepherd, 2006; McKelvie et al, 2011). This paper advances research on uncertainty by helping to refine the distinction between risk and Knightian uncertainty in the context of venture creation.

The paper begins with a presentation of the empirical and theoretical puzzles that it addresses. The empirical puzzle involves planning, or more specifically, the entrepreneurial tendency not to plan. The theoretical aspect has to with effectuation, a series of methods used by entrepreneurs in lieu of planning, and specifically with the fact that their use in conditions of risk is currently unexplained. This is followed by a brief (and necessarily incomplete) review of
the literature on decision-making under uncertainty in its various forms, including risk and Knightian uncertainty. Next, the notion of *ex ante* risk will be presented alongside the decision situation in which it intervenes, which will be termed the commercialization decision. Prospect theory will then be explained and applied to the commercialization decision, revealing the (rational) economic calculus behind the decision not to pursue commercialization without having engaged in a search for information aimed at identifying the optimal mode of commercialization. A section on the measurement of *ex ante* risk and ways in which the theory of *ex ante* risk may be tested in the field by researchers draws the paper to its closing discussion of implications and directions for further research.

**The Puzzle of Non-Optimization**

The reluctance of economic actors to engage in some version of textbook optimization has been the subject of long-standing debate in the discipline of economics and in related fields, but it has only recently entered the field of entrepreneurship, and that via effectuation. The presence or absence of optimizing behavior is often judged in terms of search, which is generally requisite for optimization because it enables the actor to obtain, identify and rank decision outcomes in order that the optimal one may be chosen. In the words of Uzzi (1997), “if there is no search behavior there can be no ranking of alternatives and therefore no maximization” (50). Mainstream economists recognize that search has costs, namely information costs (Simon, 1955; Stigler, 1961). Collectively the economic notions of search and information costs translate into the notion of planning in the managerial and entrepreneurial context, for which Mintzberg’s aforementioned (1994) definition stands.

To the extent that planning has been treated in the entrepreneurship literature, the question most often posed about it is not why some actors engage in it and others do not, but
about the effect of planning on venture outcome or performance. In fact the idea that entrepreneurs may not plan is a somewhat controversial one, not least because formal planning, often in the guise of a business plan, has been stressed as a best practice in the normative entrepreneurship literature since its inception in the 1970s (Bygrave et al., 2007; Brickman et al., 2012; Honig and Karlsson, 2004; Barrow et al., 2001; Honig and Samuelsson, 2012; Liao and Gartner, 2006; Castrogiovanni, 1996). Recently, a debate has emerged in the scholarly literature between those who suggest that planning is indeed best practice and those who suggest that it be eschewed in favor of experiential learning (Wiltbank et al., 2006; Brews and Hunt, 1999; Brickman et al., 2012; Gruber, 2007; Sarasvathy, 2001; 2007; Delmar and Shane, 2004; Allinson et al., 2000). Meanwhile, virtually no empirical research has been undertaken to ascertain directly the degree to which entrepreneurs actually do engage in planning (Lange et al., 2007), and the reasons why they may or may not do so. However, a large amount of empirical data now exists from researchers who have looked at the effect of planning on performance, as well as from those who have looked at nascent entrepreneurs (Carter et al., 1996).

Indeed, on the empirical side, the quantitative and qualitative evidence is mounting that would-be entrepreneurs are not consummate planners. In a survey of 116 Babson College graduates who started independent for-profit businesses Lange et al. (2007) found that 52 started without a business plan. In a study of 223 Swedish entrepreneurs Delmar and Shane (2004) found that 6% had completed a business plan six months into the venture creation process, and that 25% had by 12 months. In a different (2003) article, the same respondents were asked if they had undertaken four actions, such as pro forma creation, which indicate planning. The mean, out of 4, was .8 at six months and 1.72 at 12 months. Kraus et al. (2006) looked at the degree of planning in the pre- and post start-up phase at 290 Austrian firms founded in 1999 and came with a mean score of 4.06 out of 12. Karlsson and Honig (2009)
found that out of 396 Swedish entrepreneurs only 22.5% had written a formal business plan during the nascent phase of their firm’s development. Lastly, in a study of 276 nascent US entrepreneurs Liao and Gartner (2006) found that 62% of respondents had engaged in planning in the time leading up to the founding of their venture, but that only 20% had a formal plan.

In terms of qualitative research, Sarasvathy (2001; 2007) found in her study of expert entrepreneurs that only four of 27 subjects would have used “market research or any kind of predictive analysis” in setting up a hypothetical venture (33). Similarly, in the international venture creation context, Ellis and Pecotich (2001) found in their study of 31 foreign entry modes that only two were created using an optimization-driven logic. About the other 29 entries, the authors write that the modal choices "...appear to be completely lacking in rhyme or reason..." (119). In addition to this and the above data may be added the following qualification: even when would-be and actual entrepreneurs engage in planning, it is often not for the sake of making an optimal decision, but for the benefit of an external party, such as a bank or venture capital firm (Kuratko and Hodgetts, 2001; Lange et al., 2006; Bygrave et al., 2007; Brickman et al., 2010). Thus, while the majority of the studies mentioned here focused on the effect of planning on firm development or performance rather than on planning itself, the empirical data they contain clearly shows an entrenched tendency towards non-optimization among would-be entrepreneurs.

The theoretical side of this puzzle manifests itself in the effectuation literature, which is premised on the idea that would-be entrepreneurs engage in effectual forms of entrepreneurship when Knightian uncertainty prevents them from planning, or engaging in a rational “search and select” commercialization process (Sarasvathy 2001; 2007). Effectuation itself may be pragmatist in nature (Read et al., 2016), but it is nonetheless built on an implicit yet sturdy foundation of neoclassical economics. To use a more precise metaphor, Sarasvathy carved out a theoretical niche for it using the work of Frank Knight (1921), which holds that rational actors
are unable to optimize when faced with situations in which information is unavailable (more on Knight shortly). The implication being, of course, that the *homo economicus*-type rational actor will always optimize if he or she can. Effectuation is therefore the exception, not the norm, and it is explained, to a certain extent, by neoclassical economics. What scholars have yet to show is how neoclassical economics can also explain why would-be entrepreneurs use effectual principles rather than search and select procedures under conditions of risk, when they could in fact optimize. This kind of non-optimizing behavior arguably occurs on a much more frequent basis than that related to situations in which Knightian uncertainty or some equivalent thereof is prevailing. The main argument of this paper is that prospect theory may be used to explain the rationale behind some instances (by no means all) of non-optimization in the venture creation context, and by extension explain the economic rationale behind the use of effectual methods under conditions of risk rather than Knightian uncertainty.

**Non-optimization Under Quantifiable Uncertainty (Risk)**

The phenomenon of non-optimization, or the idea that economic decision-makers do not seek the outcome with the highest expected utility, has generally been viewed as the result of uncertainty, which can be classified into two categories: unquantifiable and quantifiable. The former may take one of three forms: what Kirzner (1997) calls ‘sheer ignorance’ plus what Dosi and Egidi (1991) call substantive and procedural uncertainty. Sheer ignorance is the state of not knowing what one does not know. Schmidt described this state of unknowing as ‘pure uncertainty’ (1996: 78) in order to differentiate it from Knight’s notion of true uncertainty. Taleb (2007) made this kind of uncertainty the subject of his book on global finance, *The Black Swan*, and Rumsfeld (2002) brought the notion into political domain when he famously discussed ‘unknown unknowns’ in relation to the conflict in Iraq. In these most extreme of
uncertain conditions optimization cannot occur because there is, in the mind of the decision-maker, nothing to optimize.

Under substantive and procedural uncertainty one knows what one does not know, but one is unable to optimize, respectively, either for nonexistent information or for what amount to mechanical reasons. Knight’s true uncertainty is substantive in that the actors in that situation are aware of the unique event they face and its attendant decisions, but they have no way of estimating their chances of successful outcome for lack of knowledge. Awareness exists, but the knowledge needed does not, therefore it cannot be attained. Other forms of procedural uncertainty include Simon’s (1955) notion of bounded rationality, which posits that physical, mental and temporal constraints prevent humans from optimizing (knowing). His decision-maker is aware of the decision at hand, knowledge related to the decision outcome does exist, but the actor is unable to obtain or compute enough of it to determine the optimal outcome. Both true uncertainty and bounded rationality are ingenious theoretical explanations for why otherwise optimizing individuals do not engage in standard rational choice.

While a number of researchers have considered the effects of unquantifiable uncertainty on entrepreneurial behavior (Sarasvathy, 2001, 2007; Alvarez and Busenitz, 2001; Loasby, 2002; Alavarez and Barney, 2005), this paper is concerned with the effects of quantifiable uncertainty thereon. This kind of uncertainty, what Knight (1921) referred to as risk, involves uncertainty that may in theory be reduced or eliminated, thereby permitting optimization, at least in principle. Under the quantifiable umbrella one finds, among others, the following explanations of non-optimization: satisficing, heuristics and biases, overconfidence and resource costs. These decision models have the potential to explain non-optimizing behavior under conditions of risk. What will be shown here is that none of these on its own provides an

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1 There is some ongoing debate about the measurability or immeasurability of Knight's true uncertainty, despite the fact that he declares it immeasurable (Knight, 1921: 233). See for example Schmidt, 1996b and Davidson, 2010.
alternative rationale for the kind of systematic non-optimization seen in the entrepreneurial context.

Simon’s (1955) concept of satisficing explains limited optimization in an administrative context by suggesting that actors will tend to opt for the solution that is ‘good enough’, or for the first one that meets their aspiration level, rather than continue to engage in otherwise costly search. Indeed, it is the presence of information that meets aspiration level coupled with the additional cost of the information needed to exceed it that triggers the satisficing response (Simon, 1955). If viewed in the light of satisficing, the fact that entrepreneurial actors may avoid search in favor of the information at hand would suggest that such information met their aspiration level, rendering further search unnecessary. While this is certainly possible, satisficing presupposes that economic actors nonetheless search for information until that point when further search becomes cost ineffective. In satisficing terms, the idea that a decision-maker would forego search completely in favor of information at hand, such as that from networks for example, suggests either that aspiration level is exceptionally low (any information will do) or that coincidence led to this first-in-sequence information meeting the aspiration level. Thus, in cases where search is simply foregone in favor of at-hand information, satisficing provides a possible but somewhat awkward explanation.

Another explanation for non-optimization under risk comes from Kahneman and Tversky, who approach decision-making under risk from the viewpoint of cognitive psychology. Using various laboratory experiments they showed that rather than work out a given probability distribution, subjects instead tend to use heuristics, which lead to biases and errors in prediction (Kahneman and Tversky, 1982). Among the heuristics and biases they identified is the representativeness heuristic, according to which outcomes are chosen based on their similarity to a stereotype or other pre-existing notion in the mind of the decision-maker, rather than on statistical reality (Tversky and Kahneman, 1974). More precisely, an outcome is
chosen because of its resemblance to, or representativeness of, the pre-existing idea that the decision-maker has of what the optimal outcome ought to be, rather than what it actually is. Thus, the representative heuristic allows the decision-maker, at his or her own peril naturally, to skip over the information search and analysis part of the decision process, as long as one of the known decision outcomes corresponds to what he or she believes to be the more or less optimal outcome.

Busenitz and Barney (1997) tested the representativeness bias among a group of entrepreneurs and managers and found that the former had a much greater propensity to base decisions on representative data than their managerial counterparts in large firms. They speculate that entrepreneurs may avoid ‘econometric-type’ rational decision-making and use heuristics because 1) the information they require to make such decisions is harder to obtain than that required by managers, 2) they have to deal with many problems at once and 3) they have to make decisions under time pressure. While this may well be true, the use of the representativeness heuristic presupposes that those using it have before them an outcome possibility that roughly corresponds to what they believe to be the optimal one. This is, after all, what justifies dodging the econometrical analysis. It is this aspect of the heuristic, that outcomes are selected based on their resemblance to an imagined optimal outcome, which can render it problematic in the entrepreneurial context. For one, it is at odds with the idea that entrepreneurs often act in increments, something that has long been accepted in the entrepreneurship canon (from Casson, 1982 to Stevenson, 1983 up to Sarasvathy, 2007). Incremental action may be taken not because a possible outcome resembles what the entrepreneur believes is the optimal one, but because he or she believes it may eventually lead to the optimum. A venture mode chosen for the latter reason could bear little or even no resemblance whatsoever to the optimal mode imagined. Thus, while the representativeness
heuristic is able to explain a certain amount of entrepreneurial decision behavior, it cannot on its own explain the kind of systematic non-optimization that this paper is addressing.

Another explanation for non-optimization under risk, again involving cognitive biases, is that entrepreneurs act in the absence of complete information because they are overconfident (Cooper et al, 1988). Such actors overestimate the value of the information that they possess, believing it to be better than it is (Bernardo and Welch, 2001). They may also be completely ignorant of alternative information sources (Kahneman, 2011). Under the heading “Entrepreneurial Delusions” Kahneman gives several examples of studies that show how entrepreneurs vastly overestimate their chances of success. One of these is the research undertaken by Åstebro (2007), who shows that inventors continue to “throw good money after bad” even after being told by an authoritative source that their ideas are not commercially viable (254). A mystery of this phenomenon, at least for economists, is how firms thus created survive, as some do, and to what effect. Busenitz and Barney, who measured overconfidence bias as well as representativeness bias in their 1997 study, found that the entrepreneurs in the study were indeed significantly more confident than the managers. They speculate that without representativeness and overconfidence many ventures would not be created. Bernardo and Welch (2001) suggest that entrepreneurs who act out of overconfidence reveal valuable information to other actors who subsequently copy and improve it. This is in keeping with theory put forward by Dosi and Lovallo (1997) and Dosi and Fagioli (1998), which holds that collective growth or economic development may depend upon individual actors under the influence of overconfidence. It appears, therefore, that entrepreneurs are an optimistic lot, for better and for worse.

However, unlike the previously mentioned theories of non-optimization, overconfidence has no implicit or explicit decision-making rationale because it essentially maintains that entrepreneurs do what they do because they are ignorant, and more often than not ignorant by
choice. They choose, in effect, to ignore the ‘writing on the wall’. This is made plain by the repeated use of the term ‘irrational’ to describe the behavior of the actors in question in each of the three previously cited papers, as well as Kahneman’s tongue-in-cheek characterization of it as ‘delusional’. Overconfidence, as such, may be said to fall into the category of human tendencies that lead to erroneous decisions and suboptimal outcomes, the likes of shirking, laziness and sloppy due diligence. It is thus less of a rationale and more of a trait, along the lines of the entrepreneurship literature of the 1980s with which Gartner (1988, 1989) was concerned. Without excluding that many actual and would-be entrepreneurs are overconfident, and without excluding that this overconfidence may spill over into their venture creation decisions, this paper will continue down the road toward an alternative baseline rationale for decision-making under risk in the context of venture creation.

The final stop on that road, at least in this literature review, is with the work of Casson (1982). In his economic theory of the entrepreneur he elaborates what amounts to an ex ante theory of information costs. The previously mentioned ex post version, as per Simon and Stigler, says that information costs play a role in rational decision-making when the costs of obtaining additional information about the optimal outcome outweigh the benefits from the optimal outcome. In such cases the optimizing actor will cease search activity and select the nearly optimal outcome. Inherent in this theory, as Kirzner (1997) pointed out, is the assumption that the decision-maker knows what he or she does not know, namely the optimal outcome and the additional costs of obtaining information about it. Along similar lines, Casson posits that entrepreneurs do not engage in drawn out contingency planning, a form of undiluted rational choice, because “information processing is so costly” (27). To him, search ceases when the cost of obtaining additional information outweighs the benefit of the resulting reduction in adjustment costs. Adjustment costs are incurred when a poorly planned operation has to be
optimized after the onset of transactions in light of the information that was not foreseen for lack of planning.

Foreknowledge of adjustment costs presupposes that the entrepreneur knows what he or she does not know, though only up to a point. Casson’s entrepreneur has limited foresight, knowing what it will cost to adapt the venture in the near future based on the information that has come to light as a result of transacting in the marketplace. A calculation is made based on this information that shows when it is more efficient to cease gathering information from search and to start gathering it from transactional experience. These transactions are organized in suboptimal fashion, but it is calculatedly suboptimal in that it may be further optimized in the future and at less expense than continuing with search in the present time. In this way Casson’s entrepreneur moves through uncertainty in fits and starts, deploying foresight in sequential fashion toward an optimal outcome that his or her judgment says does exist, but which remains nonetheless unknown as decisions to act are made gradually. This account of the entrepreneurial process remains highly relevant, not least because it can explain in economic terms many aspects of entrepreneurial behavior that has been described as effectual (Sarasvathy, 2001, 2007).

Yet Casson’s brand of sequential optimization does not solve the puzzle in which entrepreneurs systematically forego search in favor of at-hand information. For one, while it constitutes an improvement over the total omniscience of actors found in neoclassical economics, it remains heavily stylized in the spirit of Stigler and Simon’s information costs: the model only works if one assumes the ‘partial omniscience’ of the decision-maker. Such an assumption makes his entrepreneur into a first cousin of *homo economicus*, who is a simulacrum or depiction of an economic actor who never did or will exist. The rationale is sound, but only abstractly so because in the real world it leads to what Teece (1986) calls the “fundamental paradox of information” (29): economic actors cannot know the costs of search
before they engage in it; if they could they would not have to engage in it. The same actors cannot know the costs of adjusting a venture to market conditions and circumstances that have not yet occurred, even on a relatively short time horizon; if they could they would have already made those adjustments. Thus, while Casson’s seminal work explains aspects of non-optimizing behavior, some of its neoclassical assumptions would need to be relaxed further in order for it to explain the central puzzle that is being addressed in this work.

The decision theories presented thus far are able to explain different aspects of entrepreneurial behavior that appears non-optimizing, yet none satisfactorily explains the systematic non-optimization that was observed in the studies by Sarasvathy, Ellis and Pecotich and this researcher. One reason for this is the focus of the theories on \textit{ex post} risk, a phenomenon that invariably involves the prospect of future losses\textsuperscript{3}. When this kind of risk is in play decision outcomes are determined by criteria emanating from the hypothetical world that will exist after the onset of transactions. These criteria usually include but are not limited to production costs, information costs and transaction costs, or in Casson’s case adjustment costs. Such costs are relevant when a preference for profit maximization or similar is assumed because, as indicators of efficiency, they determine the net result of each possible outcome. Or, more precisely, they determine the \textit{likelihood} of the net result of each possible outcome.

The word likelihood belies the fact that none of these outcomes is certain to yield the positive or negative benefits attributed to them; each is coupled with a probability of occurrence (Kahneman and Lovallo, 1993). For example, if profit is sought after then a venture creation decision with three possible outcomes might contain one with a 90\% chance of yielding a net result of -1000 Euros, another with a 10\% chance of yielding 2000 Euros and another with a

\textsuperscript{3}The temporal dimension of choice is omnipresent in the literature yet it’s rarely the focus of attention. For example, Coase described economic actors as those who “...exercise foresight and choose between alternatives” (1937: 387). And Simon said that decisions are “descriptive of a future state of affairs...” and that economic actors ”...select one future state of affairs in preference to another and direct behavior toward the chosen alternative” (1957: 56). To Shackle, “knowledge is about the past, but decision is about the future” (1970: 15).
90% chance of yielding 200 Euros. The optimal outcome in this scenario is the second option, despite its low probability of success, because its expected value is 200 Euros, whereas the expected value of the third option is only 180 Euros. It is the uncertainty contained in these future probabilities, i.e. the potential for loss associated with them, which is the definition of *ex post* risk. When focusing so intently on decision criteria that emanate from the future it is easy to overlook another form of risk, one that involves not the prospect of future losses but of present-time losses. To the would-be entrepreneur deciding whether or not to pursue an idea, the possibility of the aforementioned set of decision outcomes is more likely to be viewed in terms of the present resources that would have been squandered in the acquisition of information about an optimal outcome, one that with its mere 10% chance of success is for all practical purposes unrealizable. It is this *ex ante* perspective that the following section will now explore.

**III. *Ex Ante* Risk and the Wild Goose Chase**

*Ex ante* risk is the possibility that the costs of search incurred at the beginning of the venture creation process will be irrecoverable because the optimal venture outcome turns out to be probabilistically unlikely to succeed and therefore not worth pursuing. It is the prospect of the proverbial wild goose chase. In situations where the future performance or efficiency of outcomes is difficult to predict, such as in cases of new venture creation, *ex ante* risk can effectively cause a short-circuit in the venture creation decision. This occurs when the fear of investing in a fruitless search causes the would-be entrepreneur to forego search, leading either to premature abandonment of the commercialization effort or to premature realization of the commercialization effort. This paper maintains that *ex ante* risk and its effects have strongly determinative effects on the behavior of would-be entrepreneurs, or those who have a
commercial idea but lack information about the commercialization process. While the behavioral results of *ex ante* risk have long been observed by entrepreneurship researchers, mainly in the form of systematic non-optimization, the phenomenon itself and its relationship to that behavior has not yet been studied up close.

Prospect theory, or more specifically some of its constituent principles, may be used to explain *ex ante* risk and its effects on the venture creation process. It cannot be applied ‘as is’ to the problem because it has an inherently *ex post* stance when it comes to analyzing risk. It was conceived in order to explain more reliably how economic actors choose between different decision outcomes whereas this paper is concerned with why and how such actors create ventures in the absence of information about different decision outcomes. Given the complexity of the arguments to be presented here this section will proceed in carefully delineated stages. It will begin by describing in more detail what has been heretofore referred to as the venture creation decision. Next it will introduce prospect theory and its various moving parts. It will then discuss the relationship between those parts and the venture creation decision. Lastly, it will show that prospect theory, via its notion of the reference point and principle of loss aversion, has the capacity to explain why *ex ante* risk leads to systematic non-optimization in the venture creation process.

![Figure 1: The Commercialization Decision](image-url)
The decision to which prospect theory will be applied is referred to as the venture creation decision. This decision is a two-part one, occurring when the would-be entrepreneur decides first whether or not to commercialize his or her idea and secondly how to do so. In the standard rational choice-type model, which corresponds to option 1 under decision 1, a decision to commercialize is automatically a decision to select the optimal outcome from among a more or less complete set that was identified via a search process. What has puzzled entrepreneurship researchers is the tendency of would-be entrepreneurs to deviate from this decision model by foregoing the search process that is necessary to optimize. This paper maintains that the search process is often foregone in favor of a third option, which is to attempt commercialization via information already at hand. This information could come from any number of sources, including networks and solicitations by unknown parties. Because this information concerns one possible mode of venture creation, or at best a highly incomplete set of possible outcomes, the decision to use it usually pre-determines the manner in which the idea will be commercialized. In other words, decision 2 gets telescoped into decision 1. It also essentially guarantees that the outcome will be suboptimal in efficiency terms given that most alternatives have not been identified and vetted.

*Prospect Theory*

Prospect theory and its decision framework pertain to the two-part decision stemming from option 1 insofar as it seeks to explain, as expected utility theory does, how decision-makers choose from among a set of outcome alternatives. The decision model differs from expected utility only in its inclusion of a so-called editing phase in which the decision maker “organizes and reformulates” the outcomes before evaluating them and selecting the optimal one (Kahneman and Tversky, 1979). There are a number of different cognitive practices that
may be used during this phase of the decision, what are referred to as heuristics and biases (ibid, 1982). During the editing process decision-makers ‘weight’ possible outcomes in relation to a reference point, which in turn affects the value ascribed to those outcomes when they make their final choice in the evaluation phase of the decision process. By contrast, expected utility considers values in absolute terms, not as gains or losses in relation to a reference point. In melding demonstrated heuristics and biases into the expected utility model, via this editing phase, Kahneman and Tversky increase the complexity of that model but do so in a way that yields a commensurate gain in its explanatory and predictive power (Kahneman, 2011: 288).

When applied to the venture creation decision, prospect theory can explain why ex ante risk can lead would-be entrepreneurs to forego search and use at hand information if they have it. Before applying prospect theory to the venture creation decision it is necessary to go into more detail on a few of the moving parts associated with its so-called editing phase, namely the reference point, loss aversion and subjective weighting. The reference point in a decision is the subjective starting point or baseline against which different decision outcomes are evaluated (weighted) in terms of relative losses and gains. Put simply, if someone starts out with a million dollars they will feel a loss of 1,000 dollars less acutely than someone who starts out with 2,000 dollars. The same can be said of a gain of 1,000 dollars. In prospect theory value is determined by changes in wealth whereas in expected utility theory it is absolute and objective, weighted the same by everyone. The degree to which an outcome’s value varies up or down from the decision-maker’s reference point depends in part on the heuristics and biases in play.

One of the main features of prospect theory is that decision-makers have a bias toward loss, which is to say that they are more averse to losses than they are welcoming to gains. This heightened sense of loss aversion can skew decision-making from the expected utility baseline in different ways. One way is via what Kahnemen and Tversky (1979) call the reflection effect, in which decision-makers will demonstrate risk aversion when presented with the possibility of
sure gains and risk seeking when presented with the possibility of sure losses. For example, if offered a choice between a 100% chance to win 500 Euros and a 50% chance to win 1000 Euros most people would choose the former even though its objective value is the same as the latter. Conversely, if faced with a 100% chance of losing 500 Euros and 50% chance of losing 1000 Euros most people would choose the latter. Behind the sure gains side of the reflection effect is another bias, which is that decision-makers will give less weight to probabilities when sure gains are certain. When faced with the prospect of 500 Euros for sure, one would have to push the chance of winning 1000 Euros well past 50% or increase the amount itself before most people would choose the gamble over the sure thing. When it comes to the editing phase of the decision there are a variety of heuristics and biases that can come into play, but the basic mechanics of editing consist of the reference point, the principle of loss aversion and subjectively weighted values.

The Venture Creation Decision and Prospect Theory

The principles behind prospect theory can be applied to any economic decision, including to decision 1 of the venture creation decision, in which the would-be entrepreneur must decide whether or not to engage in a search for information about commercializing his or her idea. The major difference between the first and second part of the venture decision lies in the number of outcomes that are potentially in question. Where in the second part there may be five, ten, or 100 decision outcomes to consider, in the first part there is the potential for only the three indicated in Figure 1. In order for the third option to exist the would-be entrepreneur must already have a priori information about at least one actionable venture outcome, or commercialization possibility, and that without having engaged in significant search. This outcome could be the result of a solicitation from a potential business partner, a network-related
opportunity, a desire to test the idea on a small scale, or even an unfounded belief. It is the presence of the third option -- actionable information without search -- that prematurely sets the stage for prospect theory’s editing phase.

When information about a decision outcome is in hand before a search for the optimum has occurred it effectively becomes the reference point for the would-be entrepreneur. It becomes part of his or her present worth or current resources; against which any losses or gains associated with other decision outcomes will be considered. As it happens, the decision being considered has only the three possible outcomes: engage in additional search, do nothing, or commercialize without engaging in additional search. Assuming that the would-be entrepreneur chooses not to abandon the idea just yet, he or she must choose between an outcome that has zero cost (the information at hand, which is also the reference point) and another outcome, additional search, which is sure to carry costs, possibly significant ones.

This is where loss aversion enters into the equation. Kahneman and Tversky demonstrated that no matter the reference point people dislike losses of any kind more than they like gains (1979). The would-be entrepreneur who finds him or her self in possession of actionable information about a venture outcome faces a decision one side of which carries a sure loss, and the other side of which does not. This leaves the would-be entrepreneur with a surprisingly simple choice, at least according to prospect theory. If the above decision situation were set up in the fashion of one of Khaneman and Tversky’s laboratory experiments it would look like this:

**Problem:** You have been given actionable but incomplete information worth $2,000. You are now asked to choose between two options:

A guaranteed loss of $5,000 with unknown odds of recovering the loss in the future OR a guaranteed loss of $0 with unknown odds of recovering the loss in the future.
Arbitrary dollar figures have been added to show that information has value, with the $5,000 value corresponding to the cost of search and the $0.00 value representing the reference point, which as an outcome is always worth zero. The fact that the probability of success of the venture’s optimal outcome is as yet unknown in both cases means that *ex post* risk is cancelled out, playing no part in the actual decision except as an unknown quantity. Prospect theory predicts that the effect of the reference point coupled with inherent loss aversion will lead this decision-maker to choose the second option.

It is *ex ante* risk, or the possibility that the search costs incurred will be irrecoverable because the optimal outcome has a low probability of success, which makes this choice a rational one. Indeed, if the decision-maker has even a modicum of confidence in his or her idea, and if the optimal form of the eventual venture is unclear – two ‘ifs’ not uncommon in entrepreneurial situations -- the rational choice will be to forego search and use the information at hand, effectively leaping before looking. While doing so appears suboptimal in terms of *ex post* terms of efficiency, the would-be entrepreneur is in fact optimizing on *ex ante* information costs, intent on identifying the most efficient, least cost, means of obtaining information about creating a new venture rather than on identifying the most efficient form of the new venture. This is how *ex ante* risk is mitigated. The difference may look subtle, but it is not: choosing a venture outcome based on the fact that one knows about it rather than about the efficiency of the transactions it will yield has profound, determinative effects on modal outcome.

*Gauging Risk Ex Ante vs. Ex Post*

In order to explore further the role of *ex ante* risk in venture creation, and in order to render the idea operational from a research perspective, it is necessary to measure it. Measurement is key because without it *ex ante* risk is conceptually intangible and therefore
incapable of functioning as a variable with potentially determinative or causal effects. If a decision situation may be objectively evaluated as carrying more or less _ex ante_ risk, then decision processes and outcomes may be analyzed in the light of such risk and testing may occur, leading to hypotheses and conclusions. However, measuring risk is a delicate undertaking because it imposes an objective gauge onto what is a demonstrably subjective phenomenon. Shackle (1970) speaks to the objective aspect of risk measurement when he says that measurement “requires a unit, a standard thing with which to compare the things to be measured. To serve its purpose this unit ...must mean the same thing to everybody” (13). The unit of measurement is the objective gauge against which the subjective phenomenon is compared. For example, when one says that a boulder weighs 50 tons, or that it displaces enough water to fill two Olympic-sized swimming pools, the gauges are standard even though every boulder is unique in the sum of its characteristics. Thus, while risk may be subjective, the scale by which it is measured must not be.

Though not all uncertainty is subjective, risk arguably is. Examples of objective uncertainty include the previously cited notions of ‘true uncertainty’ (Knight, 1921) and ‘sheer ignorance’ (Kirzner, 1997). In the first case either past instances of a decision exist or they do not, an objective situation, and in the second case one either knows about a decision or one does not, also an objective situation. Uncertainty can also be objective when one has knowledge of a decision and of the distribution of its outcomes, as in probabilistic uncertainty. Probability is a gauge of uncertainty that runs from 0 to 1 or 0% to 100% with these two extremes representing absolute certainty and with 50% representing the greatest uncertainty. For example, a 30% chance of rain is as uncertain as a 70% chance of rain insofar as the first is as likely not to happen as the second is to happen. Probability starts to measure risk as a subjective phenomenon when one takes into account that decision-makers usually have a preference for one outcome or another. This is why, for the person considering an outing at the beach, a 70%
chance of rain represents a greater risk than a 30% chance of rain despite the fact that these probabilities are equally uncertain. Conversely, a surgeon will generally not tell a patient that he or she has a 90% risk of surviving the operation just as one rarely considers the risk of winning the lottery. Risk is not just the quantification of lack of knowledge; it is also the quantification of the potential for subjective loss. It is what one stands to lose in an uncertain decision situation that makes risk subjective. The implication of this is that risk, unlike objective uncertainty, is implicitly measured in relation to what is potentially lost: it is very risky to go to the beach when the probability of rain is 70% because you may well lose your day in the sun. In order to measure risk, therefore, a standard gauge is necessary, as well as an understanding of the decision-maker’s preferences or, more accurately, anti-preferences, such that what he or she has to lose is understood.

Probability as a measurement of *ex ante* risk is precluded because it introduces circularity into the argument. For example, the would-be entrepreneur wants to know if at least one of the decision outcomes he or she faces will have a greater than 50% chance of success in order to proceed with commercialization. The only way to know that is to engage in risky search, something that research has told us has a tendency not to occur. Furthermore, the result of the search is the outcome distribution, a measure of *ex post* risk. This measure will tell the would-be entrepreneur what he or she wants to know, but too late – the information costs needed to get there have already been sunk. Thus, some non-probabilistic form of measurement must be used to understand *ex ante* risks and its effects on entrepreneurial decision-making.

There is precedent for this with regard to *ex post* risk. In their well-known study of the internationalization process Johanson and Vahlne (1977) used psychic distance as the measure of uncertainty in venture creation. Similarly, Kogut and Singh (1988) used cultural distance to measure risk in the same context. The greater these distances, they argue, the greater is the potential magnitude of production and transaction costs (potential for loss) and the more risky
is the venture. Psychic and cultural distances are determinant variables because they compel the decision-maker to act in a way that will mitigate the associated potential for ex post loss by choosing one entry mode over another. While Johanson and Vahlne do not explicitly derive their measurement scale from Hofstede (1980), Kogut and Singh do, effectively turning that well-known index into an objective gauge of risk in the context of international venture creation.

The above examples of non-probabilistic ex post risk measurement are instructive for the ex ante version of the task, where information costs are the key. Information costs, or the costs associated with search, are what drive risk in the early venture creation process because they represent what the would-be entrepreneur has to lose if the search were to reveal itself fruitless. It stands to reason then that the greater these costs are, the greater is the ex ante risk. The magnitude of information costs can be quantified in different ways depending on the decision situation under study. This procedure is similar to that followed with psychic and cultural distance, which were used as proxies to represent the magnitude of ex post production and transaction costs and by extension the degree of risk facing an international project. Some examples of information cost proxies include quantifying them in monetary or temporal terms, or in terms of the relative availability of information, with less available information being more costly to obtain. An estimate of the actual number of possible outcomes to a decision could also be imagined, with more open-ended decisions costing more to make than less open-ended ones. The proxy chosen will depend on the decision situation and the data available to the researcher.

Dimension is given by setting magnitude on a scale from high to low. Any scale should have Knightian uncertainty at one end and absolute certainty at the other with different degrees of ex ante risk in between, similar to the scale given in Figure 2 below. The degrees in that scale correspond to the proxy of relative availability of information. The less available is the
5 - No information exists about possible decision outcomes.
4 - Information exists about possible decision outcomes, but the amount is vast.
3 - Information exists, but major research is required to obtain it.
2 - Information exists, but with some research required to obtain it.
1 - Information exists, but very little research is required to obtain it.
0 - Information about optimal outcome is in hand.

Figure 2: Ex ante risk measured as a function of availability of information

Information needed to estimate the outcome distribution for a decision, the greater are the information costs required to do so, and by extension the greater is the degree of \textit{ex ante} risk. At risk degree 1, for example, information about the outcome distribution is relatively available, so optimizing via search is straightforward and low-cost, and therefore not particularly risky for the would-be entrepreneur. By contrast, the information at risk degree 4 is relatively unavailable, requiring the would-be entrepreneur to engage in a protracted search in order to obtain the outcome distribution, a costly undertaking that is very risky in \textit{ex ante} terms.

The task of the researcher studying the effect of \textit{ex ante} risk on the venture creation decision is not to use this scale \textit{per se}, but to come up with one that fits with the decision or decisions under study. The above uncertainty scale or its equivalent effectively allows the researcher to gauge the amount of uncertainty that the subject is facing and to compare that with the behaviors observed. In short, it allows the effect of \textit{ex ante} risk on decision outcome to be tested and explored further. It also, along with the content of this paper, is intended to render the concept tangible enough so that it can be separated from the background noise that
accompanies entrepreneurial decision-making and viewed as one distinct variable among many that determine how new ventures are developed and created.

IV. Conclusion: Some Implications and Directions for Further Research

The aim of this paper has been to present a rationale or theory of decision-making that is capable of explaining why would-be entrepreneurs show a tendency to avoid optimizing behavior when creating new ventures. The paper used as its empirical point of departure three studies in which a marked and general non-optimizing tendency, namely lack of search, was observed among subjects engaged in decision-making around venture creation (Ellis and Pecotich, 2000; Sarasvathy, 2007). It showed that existing decision theory was unable to present a satisfactory rationale for the brand of non-optimization observed in these studies. It then presented an alternative rationale built around the idea that lack of search by would-be entrepreneurs is a rational response to ex ante risk, or the notion that search procedures may result in a set of possible outcomes none of which has a greater than 50% probability of success. Such a scenario would in effect constitute a ‘wild goose chase’ insofar as the current resources expended in the search process would be irrecoverable due to the unfavorable odds leading either to abandonment of the commercialization effort or to its ultimate failure. Prospect theory was used to show how ex ante risk, or the threat of this scenario, leads some would-be entrepreneurs to commercialize an idea without engaging in any significant search for information about the optimal way of doing so. Specifically, those would-be entrepreneurs with actionable, non search-based information about one commercial outcome will tend to act on that information a) because it is costless and b) because the chances of its success are no less uncertain than the chances that an expensive search process will result in information about a probabilistically viable outcome. As with any conceptual paper the theory that is presented
herein requires testing in order to be validated and developed. It is with that eventual testing in mind that a measurement scale for *ex ante* risk was proposed, against which the determinative effects of the phenomenon on entrepreneurial behavior and outcomes may be assessed and judged.

In the field of international business (IB) the theory of *ex ante* risk and its effects do not challenge orthodoxy so much as bring attention to an aspect of the internationalization process that may have been overlooked by it. Following mainstream economic principles, much of the IB literature maintains that foreign entry modes are or should be created based on specific *ex post* cost considerations (as per Hymer, 1976; Teece, 1986; Rugman, 1981; Dunning, 1981; Casson and Buckley, 1976, 2009). Implicit in this approach is that decision-makers will use foresight to identify and estimate these costs such that the optimum may be selected. Foresight need not be oracular in nature; it may be based on a search for existing information, which is to say information from the past, which can be used to estimate future outcome distributions. Yet the actors in the 2012 internationalization study only looked to the future, which is to say, engaged in some degree of search-based optimization, 23% of the time. This finding is in keeping with the 2001 study by Ellis and Pecotich who found that of 31 export-driven foreign entry modes, only two were created using an optimization-driven logic. About the other 29 entries, many of which involved information from networks, the authors write that they "...appear to be completely lacking in rhyme or reason... appear illogical, arbitrary, or suboptimal... [are] apparently irrational... appear to defy the optimizing logic of the market" (119).

The theory of *ex ante* risk is able to explain some of these cases of international venture creation that otherwise appear to be suboptimal by *ex post* standards. That rationale holds that the initial modal form of a new venture, international or otherwise, may be determined by one of two methods, each of which has a distinctive but related optimizing rationale. The first
method occurs when the magnitude of early information costs confronting the would-be entrepreneur is relatively large, requiring that significant resources be deployed to obtain the information necessary to optimize. Loss aversion related to this outlay will prompt the entrepreneur either to abandon the venture, perhaps until at-hand information appears spontaneously later, or to bring the idea to market in the most expedient way using information already at hand. In order to survive, ventures created in this way must either be optimized after the onset of transactions, or else insulated from competition by monopoly effects. The second method occurs when the magnitude of information costs is relatively low, allowing the would-be entrepreneur to optimize in textbook fashion and create an initial venture that approximates the ideal. To this point the IB literature has tended to focus on variations of the second method, but it may be that in many cases of international venture creation modal choice is determined by *ex ante* factors related to the risks associated with early information costs. If it were true that a large number of international ventures are created using at-hand information only to be optimized later, this would open up a number of avenues for research and expand the normative scope of the field.

In the field of management, the theory of *ex ante* risk ties in neatly with Milliken’s (1987) elaboration of environmental uncertainty, but it predicts different behavior. His notion of uncertainty is equivalent to Knight’s notion of risk insofar as he maintains that uncertainty is reducible via ‘scanning’ or search, an idea that implicitly recognizes the existence of past instances. He also maintains that decision-makers who perceive the environment to be very uncertain will engage in more search while those who perceive it to be relatively certain will engage in less (139). This is in keeping with rational choice theory, which mandates that the information needed to optimize be obtained in one way or another. The idea of *ex ante* risk elaborated herein and explained by prospect theory predicts the opposite. It says that those with no actionable information at all about possible outcomes will weigh the costs of obtaining that
information against the *status quo*, while those with some actionable information will weigh the costs of obtaining additional information against that which they already have. In both cases, those who perceive the environment to be more uncertain will be less likely to engage in search because of the costs associated with reducing that uncertainty. In the first case this results in no action at all, and in the second it results in action being taken based upon the information at hand.

This suggests that managers engaged in venture creation for reasons of diversification or growth engage in a different kind of risk management than that to which they are accustomed in managing existing operations. In the early stages of venture creation optimization may require obtaining low-cost actionable information such that ideas may be brought to market as expediently as possible precisely in order for them to be optimized. Researchers in the field of management could examine conditions and best practices for managing *ex ante* risk, which is to say best practices for minimizing the amount of information costs incurred during this process. They could also do the same for the aforementioned transition from one form of optimization to the other, which is in effect the transition from creative entrepreneurial behavior to administrative managerial behavior.

And lastly, in the field of entrepreneurship, the theory of *ex ante* risk helps resolve some lingering ambiguity related to effectuation and Knightian risk. Sarasvathy’s (2001, 2007) theory of effectuation suggests that expert entrepreneurs use various non-optimizing means at their disposal to bring an idea to market rather than attempt to engage in a ‘search and select’ process that would yield the optimal venture outcome from the outset. Her reasoning, as previously described, is that effectual methods enable would-be entrepreneurs to take action under conditions of true uncertainty. The theory of *ex ante* risk does not contradict this idea, and it contributes to resolving the ambiguity around why entrepreneurs seem so often to engage in effectuation when confronted with Knightian risk rather than uncertainty. It reasons, using
prospect theory, that actors facing risky venture creation situations deviate from standard optimization in order to economize on \textit{ex ante} information costs. By doing this they mitigate the risk that they will incur an irremediable loss of current resources if the search process yields information about an optimal outcome with a poor probability of success. Thus, viewed in the light of \textit{ex ante} risk, effectual methods appear to be rational ways of economizing on the costs of information in risky venture creation processes as well as in truly uncertain ones.

An important implication of \textit{ex ante} risk management and effectual methods is that success or failure in entrepreneurship depends not on what occurs during the venture creation process so much as on what comes after the venture has been created. This is tied to the fact that by definition such strategies yield initial venture outcomes that are suboptimal by \textit{ex post} efficiency standards, something that was also a feature of Casson’s (1982) work. Entrepreneurial success, therefore, depends on the entrepreneur’s ability to transform the venture after the fact into something that can withstand market forces by optimizing \textit{ex post} efficiency. This idea is different from the usual idea that entrepreneurial success depends upon the nature of the idea being brought to market and on the manner in which it is brought to market, two areas on which the field of entrepreneurship has traditionally focused. If effectual methods are the only way forward in truly uncertain cases of high innovation, and if they are routinely used along with other methods to economize on the costs of information acquisition in risky venture creation situations, then entrepreneurship researchers may indeed want to turn more attention toward that \textit{ex post} transformation process. This area is understudied, no doubt because the entrepreneurial process has been generally considered to be over at the point when the venture is created, notwithstanding work on harvesting. If entrepreneurial action during the venture creation phase is largely determined by a preference for information cost economies, then in many ways the entrepreneurial process has only just begun when the venture is created.
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