

Creation, Risk, and Uncertainty

Towards a Unifying Theoretical Framework for Entrepreneurial Strategy

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Abstract: The growing literature on strategic entrepreneurship has generated a profusion of conflicting claims with unclear boundaries among them, suggesting the need for a theory that reconciles these inconsistent findings. This paper addresses this need with a parsimonious framework that contextualizes strategic decisions in terms of three foundational concepts from the strategic entrepreneurship literature: (a) creation of something new, (b) risk in terms of variation in possible outcomes, and (c) uncertainty in the sense that quantifying these outcomes may be difficult. We apply our framework to develop testable propositions that propose boundary conditions for several well-known but disputed claims in strategic entrepreneurship research and identify when entrepreneurial decision-making approaches are likely to be most effective.

1. INTRODUCTION

Over the past few decades, there has been an explosion of interest in entrepreneurship from researchers in strategic management. In recent years, researchers have explored the role entrepreneurship plays in value appropriation (Kaul, 2013), commercialization (Kaul, Ganco, & Raffiee, 2021), knowledge diffusion (Agarwal & Shah, 2014; Gambardella, Ganco, & Honoré, 2015), and value creation in public organizations (Klein, Mahoney, McGahan, & Pitelis, 2013), among many others. This and related research often leverages classic research on topics such as managerial cognition [e.g., Hambrick and Mason (1984)], resource allocation [e.g., Penrose (1959)] and competitive advantage [e.g., Lippman and Rumelt (1982)]. For instance, well-received work has explored whether and how entrepreneurial cognition and decision-making differ from that of managers in established organizations (e.g., Chen, Croson, Elfenbein, & Posen, 2018; Dushnitsky, 2010; Mitchell et al., 2007).

Although we have learned much from this work, it has also produced competing theoretical claims and inconsistent empirical findings. These conflicting claims and findings include statements regarding some of the most widely studied topics in the field. For instance, while entrepreneurship research has shown a great deal of interest in the differences between entrepreneurs and managers (Busenitz & Barney, 1997; Chen, Greene, & Crick, 1998; Litzinger, 1965; Stewart Jr & Roth, 2001), the literature has yet to reach consensus on the specific biases, heuristics, and behavioral propensities that determine whether a decision-maker is behaving entrepreneurially or simply practicing day-to-day management. Similarly, prominent research suggests that decision-makers should employ traditional managerial decision tools (e.g., discounted cash flow analysis), “simple rules” (Eisenhardt & Bingham, 2017), or tools designed specifically for entrepreneurial strategy (e.g., test two, choose one) (Gans, Stern, & Wu, 2019) when engaging in entrepreneurial decision-making, but it is unclear which situations are most suited to the application of which tools.

We are not alone in this observation. A recent, well-cited review paper states that the literature “has been inconclusive if not contradictory” regarding specific biases such as the risk attitudes of

entrepreneurs compared to other populations (Kerr, Kerr, & Xu, 2017: 26). Moreover, these comments are not merely theoretical puzzles. There are good reasons to believe that they have substantive implications for the guidance we provide to entrepreneurs and managers. For instance, past decades have witnessed many high-profile entries into low-cost air service by both new airlines (e.g., Southwest, Ryanair, JetBlue) and legacy airlines (e.g., British Airways' Go, Delta's Song). Should the managers of the new airlines have used different decision-making tools than the managers of the legacy airlines? Would we expect the former managers to exhibit different psychological characteristics than the latter? Regardless of the degree of insight offered by individual papers, the lack of consistency in definitions, claims, and tests within the field has impeded our ability to build knowledge.

The existence of competing claims and inconsistent empirical findings indicates the need for more systematic thinking and more careful theory development. Without a systematic approach, it is difficult to consistently define key concepts and constructs, to propose how these concepts are related, and to describe why these associations are predicted (e.g., Dubin, 1978; Whetten, 1989). Without a theory to guide the design of our experiments, we are left with a series of unscientific and unverifiable claims. If we are unclear about the boundary conditions surrounding our theory and experiments, it is difficult to compare findings and cumulatively build knowledge.

The purpose of this paper is both to address these conflicting theoretical and empirical claims and to provide guidance for future empirical work in entrepreneurial strategy. To do so, we develop a parsimonious theory in which we argue that whether a particular claim in the strategic entrepreneurship literature will apply to a particular strategic decision depends critically on the following decision attributes: 1. Creation (C): To what degree does the decision rely on creativity in developing a new and different product, process, or way of organizing? 2. Risk (R): How much do the expected results vary about a central tendency? 3. Uncertainty (U): To what degree is it possible to quantify outcomes and impute probabilities to their occurrence?

We use this “CRU” framework to develop a series of propositions that identify boundary conditions between important theoretical and empirical claims in the strategic entrepreneurship literature, for example, (a) when entrepreneurial decision-making tools are likely to be more effective vis-à-vis traditional decision-making tools and (b) when managers are likely to exhibit personality characteristics associated with entrepreneurship like overconfidence. We then address a number of concepts that have been proposed as integral to entrepreneurship (e.g., a firm being new or young, putting capital at risk). We show that these concepts do not have a clear position in the dimensions defined by the CRU framework. The implication is that these concepts do not have first-order effects on strategic decision making, are therefore of relevance not only to firms traditionally considered entrepreneurial but also to many firms that would traditionally be viewed as having long since ceased to be entrepreneurial, and are therefore insufficient indicators of entrepreneurial behavior.

It is also important to understand what we are *not* doing. First, we are not proposing another definition of entrepreneurship that includes some research but excludes others, nor are we taking a view on how entrepreneurship scholarship fits within the academic classification system of business and basic disciplines. Rather, we are setting aside these definitional debates to propose a “sandbox” in which different scholars with different interests in entrepreneurial strategy can “play” harmoniously. Second, we are not proposing another refinement of the dichotomies of creation versus discovery (Alvarez & Barney, 2007a; Foss & Klein, 2017) or risk versus uncertainty (Alvarez & Barney, 2007b; Dequech, 2011; Packard, Clark, & Klein, 2017; Townsend, Hunt, McMullen, & Sarasvathy, 2018). Rather, to make our theory as parsimonious and as accessible as possible, we have intentionally based our theory on classic building blocks using standard definitions. An as example, our definition of “uncertainty” as characterizing the degree to which a strategic decision maker, for a variety of reasons, cannot ascribe precise probabilities to possible outcomes follows directly from a tradition of scholarship over a century old (Alvarez & Porac, 2020). But, as we explain later, our theory is robust to variations in our definitions. To wit, at the cost of increased complexity, one could posit that uncertainty arises in different forms

without fundamentally changing our main theoretical propositions. Similarly, one could collapse risk and uncertainty into a single construct without fundamentally changing our theory's central assertions, although this simplification would arguably deprive our theory of some realism and contextual richness.

2. AN ENTREPRENEURIAL DECISION AND ITS ELEMENTS

A crucial first step in developing a framework to address the conflicting theoretical and empirical claims in the entrepreneurial strategy literature (after acknowledging the problem) is to pick a unit of analysis.¹ For the purposes of this paper, we find it useful to focus on the attributes of an entrepreneurial decision. In choosing the decision as the unit of analysis, we acknowledge that the decision, the action, and the decision-maker are inseparable (Hambrick & Mason, 1984), because every entrepreneurial phenomenon (e.g., founding a new venture, entering self-employment, making choices under uncertainty) has at least one decision, at least one decision-maker or actor, and at least one action. Entrepreneurship is a process or journey that is initiated with the decision to take action (Hambrick & Mason, 1984; McMullen & Dimov, 2013) or, as Wood, Bakker, and Fisher (2021: 148) put it, even entrepreneurial action theory itself “is broadly concerned with the *decision* to take action toward entrepreneurial endeavors under conditions of uncertainty” [our emphasis].

Our focus on the entrepreneurial decision is consistent with two important intellectual traditions that inform our work. One is the study of entrepreneurship. As is well-known, scholars have not coalesced around a singular definition of entrepreneurship, with seminal research proffering exhaustive lists of activities related to creating something new in the commercial sphere (Penrose, 1959; Schumpeter, 1934), and more recent research defining entrepreneurship variously as the creation of organizations (Gartner, 1988), the pursuit of rent-seeking (Baumol, 1990), assembling the factors of production (Lazear, 2005), the discovery and exploitation of new means-ends relationships (Shane & Venkataraman, 2000), or structural transformation (McMullen, Ingram, & Adams, 2020). Yet, much of this research appeals,

¹ We do not provide an in-depth review of the conflicting claims and evidence as prior presentations of these ideas suggest the existence of these theoretical disagreements and contradictory results is well-accepted within the research community.

implicitly or explicitly, to the focus on judgment put forth by Knight (1921) and other Austrian scholars. As Foss and Klein (2012: 102) write, "...the unit of analysis should be the assembly of resources in the present in anticipation of (uncertain) receipts in the future, in other words, investments." As such, entrepreneur-managers formulate and solve strategic problems (Nickerson & Argyres, 2018), in order to best arrange human and capital resources to generate economic profit (Foss & Klein, 2017; Klein, 2008).

The other intellectual tradition emphasizes strategic-decision making. The strategic decision-making literature is fundamentally concerned with choices that commit the firm to a course of action when it is difficult to accurately predict outcomes (Ghemawat, 1991), that guide other choices toward a proposed solution in an ambiguous or uncertain environment (Van den Steen, 2017), or that are highly interdependent with other choices made by the firm over time (Leiblein, Reuer, & Zenger, 2018). These sorts of decisions are consistent with fundamental questions in the strategic management field that ask why firms differ (Rumelt, Schendel, & Teece, 1994), how firms create and capture value with transaction partners (Brandenburger & Stuart, 1996; Gans & Ryall, 2017), how firms decide "what activities and assets to combine" (Zenger, Felin, & Bigelow, 2011: 97), how to acquire or accumulate these assets at low enough cost to allow for their profitable use (Barney, 1986; Dierickx & Cool, 1989), and how to obtain market power within industries (Porter, 1985). In short, this work focuses on how managers matter, while also recognizing that who the decision-makers are—whether one person or a team—is a critically important contingency (Hambrick & Mason, 1984; Westphal & Zajac, 2013).

A focus on entrepreneurial decisions allows us to develop claims that are consistent with the characteristics of a good scientific theory, as set forth by Kuhn (1977: 320-322).² Our schema of entrepreneurial decisions helps to specify the domain of entrepreneurial decisions by suggesting boundary conditions for particular theories that help reconcile observed inconsistencies between existing theory and

² Kuhn (1977: 320-322) asserts that good theory offers accurate predictions within its domain, is consistent within itself as well as with other currently accepted theories, is appropriately broad in scope, is simple enough to bring order to the phenomena, and is fruitful in the sense that it generates insight or illuminates underappreciated relationships.

evidence. Our theory is simple and parsimonious in focusing on three decision dimensions: We argue that a decision is more entrepreneurial, the more it exhibits creation, risk, and uncertainty. While more dimensions and sub-dimensions could be included within our schema, we limit ourselves to these three because a simple and parsimonious theory is preferable to a more detailed theory “that does less to reduce the complexity of the empirical world” (Bacharach, 1989: 509). As we explain at various points below, moreover, one could incorporate more dimensions and sub-dimensions without fundamentally changing our theory’s implications. Our schema is fruitful in that it allows us to compare and explain whether and when particular approaches to entrepreneurship are likely to be more or less productive. We view the core of our contribution as creating, in Schumpeterian fashion, a “new combination” of the foundational elements of creation, risk, and uncertainty in a single overarching framework for the field from a strategic perspective, which is sufficient to organize and reconcile conflicting claims and definitions.

2.1 Creation

The “entrepreneurial function” described by Schumpeter (1934) in *The Theory of Economic Development* and the “entrepreneurial services” described by Penrose (1959) in *The Theory of the Growth of the Firm* both emphasize newness or the “creation” of new products, business models, and markets. Amabile (1997) describes entrepreneurial creativity as the development of novel and useful products, services, or business models. If creativity is the generation of new and useful ideas, then common sense and casual empiricism suggest that inventing a new product, service, or means-ends relationship and establishing a new organization, whether formal or informal, are often inherently creative and entrepreneurial activities (Gruber & MacMillan, 2017).

The creative process follows the first three stages of the structured decision-making process outlined in scores of business and consulting textbooks [e.g., Carroll and Sørensen (2021); Chevallier (2016); Minto (1987); Ohmae (1982); Raisel (1999)]. Typically, this process involves defining the problem, applying theory to generate plausible alternative solutions to the problem, prioritizing and/or testing potential solutions, and implementing the chosen solution. Defining the problem involves domain

relevant skills and expertise that allow the problem to be formulated in a way that increases the chances of generating a good solution. Generating plausible solutions involves an ability to think broadly, to abandon inappropriate assumptions or routines, and to tolerate ambiguity. Prioritizing and testing potential solutions involves designing experiments or generating feedback on the likelihood of creating and capturing value through the solution.

While prior work has often associated creative outcomes with the introduction of novel, statistically atypical, or unique outcomes, our emphasis on the decision foregrounds differences in which the decision or series of decisions requires creative cognition (at the individual or collective level). On one end of a creativity spectrum, consider the cognitive load associated with replicating an existing organizational form (e.g., Army unit, chain store). Presumably, this would require little creativity if the decision-makers are sufficiently experienced to understand the process. Some “new” products are also derivative, such as changing superficial characteristics of a product to produce a new stock-keeping unit (e.g., new size or color), and would accordingly represent an incremental market or technical change (Ansoff, 1957). The antipode to this extreme would be efforts to devise an entirely new technical component (e.g., using advanced materials), new system (e.g., innovative cellular therapeutics in biotechnology), or new business model (e.g., the first discount airline, Southwest, or the first targeted-frills airline, JetBlue).

The above examples illustrate that decisions that are commonly considered to fall under the “entrepreneurial” umbrella are likely to vary in the level of creative cognition that they require. This observation also underscores the importance of the decision-maker. For a new franchisee, launching a new franchise location may involve a great deal of creative problem solving (especially on matters for which the franchisee does not receive training), whereas, for the franchisor or an experienced franchisee, the launch is routine. Thus, when David G. Neeleman founded JetBlue, he had already founded two other airlines, MorrisAir and WestJet; so, starting JetBlue, though still clearly novel and creative, did not require as much creativity as it would have of a founder less experienced with passenger air travel. For

the same reason, imitating a first-mover's action is generally less creative than deciding to be that first-mover. Accordingly, in our framework, individual decisions may be more or less creative.

Moreover, creative decisions may involve either the search for and discovery of new opportunities (Shane & Venkataraman, 2000) or the effectuation and creation of new possibilities (Sarasvathy, 2001). Thus, the creativity of a decision may be associated with the originality of the effort to search a complex space and choose among a set of alternatives (Gans et al., 2019) or in the originality of the design and construction of a new product or service that elicits “surprise,” like, say, the original iPhone. These decisions may be—and are—made by both owners and employees of organizations, large and small. Any individual may have a creative insight and make a creative decision, regardless of their status within a company or organization. Creation is simply an individual or collective cognitive attribute of a decision that distinguishes it from other, more ordinary, economic behaviors such as day-to-day management or what Penrose referred to as “managerial services.”³

This paper thus conceives of creation as a continuous measure: decisions vary along the dimension of “creation” with some decisions being highly creative, others less so, and still others almost not creative at all. The point elaborated on below is that this variation impacts decision making in terms of the challenges it imposes on the decision-maker and, thus, the relevance of individual attributes, experience, training, and tools. We acknowledge that one could sub-divide creation into different kinds (e.g., creation of a new organizational form or of a new product or technology), but, we leave such fine-grained sub-classifications aside in the interests of theoretical parsimony. Even without these additional sub-dimensions, we can make significant progress in systematically organizing the field of entrepreneurship by better understanding the types of decisions facing entrepreneurial strategists.

³ Some business decisions have elements of both creation and day-to-day management. For example, when Sam Walton discovered that distribution companies would not service Wal-Mart's rural locations, he and his team steadily created what would become Wal-Mart's famous hub-and-spoke internal distribution system. The decision to recognize and address the challenge associated with servicing rural locations had significant implications as part of the economies of scale, scope, and density that have given Wal-Mart a competitive advantage over other retailers in sparsely populated areas. The launch of their hub-and-spoke distribution system is thus, in some respects, the epitome of a creative, entrepreneurial decision that creates new possibilities. Yet, management of a distribution system also involves the very essence of day-to-day management, since it implies continuous restocking of goods and allocating of employees to maintain the flow of inventory across the network.

2.2 Risk and Uncertainty

All but the most trivial of business decisions may yield a range of possible outcomes, reflecting different levels of success or failure, among other relevant aspects. Some new product launches *succeed* spectacularly, such as Coca-Cola's introductions of Diet Coke in 1982 and Coke Zero in 2005, whereas other product launches *fail* spectacularly, such as Coca-Cola's reformulation of its flagship cola in 1985, which ultimately had to be withdrawn. Sometimes, even similar strategies may yield vastly different outcomes, as when Honda's introduction of a motorcycle for the average American in the 1950s was a fabulous success even though Indian Motorcycle had failed with the same idea a decade earlier (Makadok & Ross, 2018). Such variation in outcomes is known to influence decision-making in general (Rabin & Thaler, 2001) and has long been recognized as a key aspect of decision-making for entrepreneurs (Knight, 1921: 118). Thus, to be complete, our theory must incorporate variation in outcomes in one form another.

How to think about this variation, however, has been the subject of debate for over a century. Two aspects are critical. The first relates to the magnitude of the variation itself, which is usually quantified as variation about a central tendency, for example, the standard deviation vis-à-vis a mean. Across social sciences such as economics (Armour & Teece, 1978), finance (Eugene & French, 1992), and management (Ross, 2014b; Ruefli, Collins, & Lacugna, 1999), such variation is known as "risk."⁴ This classic notion of risk is fundamental to our understanding of how variation in profitability should relate to expected profitability in well-known theories such as the capital asset pricing model (Perold, 2004). In short, the higher the risk in terms of variation about a central tendency, the higher the expected return should be to justify an investment of time and effort. Several prominent theories suggest that this classic notion of risk influences the process through which we make decisions (Rabin & Thaler, 2001). For instance, Hardy and Maguire (2016) outline several well-accepted risk mitigation approaches (e.g.,

⁴ Risk is often used colloquially to refer only to downside variation, as in the risk of something bad happening. We do not adopt this usage herein.

diversification, hedging, risk analysis). These and related risk mitigation approaches generally utilize past knowledge to guide future behavior (e.g., Eisenhardt & Martin, 2000).

The second important aspect of variation in possible outcomes is the degree to which they can be quantified and their probabilities assessed by the decision-maker, *a priori*. It is not always possible to assign probabilities to outcomes if the situation "...is in a high degree unique" (Knight, 1921: 118). In *uncertain* situations, the decision-maker might not have a firm idea of what outcomes are possible or how to classify them (Langlois & Cosgel, 1993), or know how their future self will feel about these possible outcomes (i.e., future preferences might be unknown) (Rogotti & Shannon, 2005). Moreover, even if outcomes are known, their probability of occurrence may be hard to assess. For example, "the market" may not (yet) exist or it may exist, but other market participants may also have trouble assessing probabilities and thus imputing a value (Demsetz, 1988; LeRoy & Singell Jr, 1987). On still other occasions, even if it were possible to develop categories of observations and estimate probabilities for them, decision-makers may, due to cognitive limitations, tend not to do so. Human decision-making may thus resemble a "scissors" of which one blade is the task environment and the other is the cognitive capability of the decision-maker (Simon et al., 1987). When human decision-makers are *uncertain* about a decision, they use adaptive shortcuts like guesses or vision (Foss & Klein, 2012; Kirzner, 1997; Sarasvathy, 2001), judgment (Foss & Klein, 2012), "simple rules" (e.g., Bingham & Eisenhardt, 2011, 2014), "sensemaking" (Cattani, Sands, Porac, & Greenberg, 2018; Weick, 1995), or novel categorizations and mental models (Csaszar, 2018; Levinthal, 2011) to reach their conclusions.

Although probabilistic (or expected utility) reasoning is assumed in many economic models of entrepreneurial and strategic decision-making (e.g., Ching, Gans, & Stern, 2019; Ross, 2014a, b), both risk and uncertainty affect decision-makers. Moreover, entrepreneurial decisions differ in the degree of risk and uncertainty that they exhibit. A venture based on a potentially revolutionary but unproven technology may exhibit a higher dispersion in possible outcomes than a venture based on a well-known technology. Similarly, the degree of uncertainty surrounding a decision may also vary. The literature

notes the possibility that “*partial* knowledge restricts entrepreneurs’ ability to identify the entire set of choices and probability of each outcome” (Moeen, Agarwal, & Shah, 2020: 221) [our emphasis] and that members of an entrepreneurial team may *partly* disagree about the value of their idea (Kaul et al., 2021). In other words, uncertainty is not a discrete characteristic of decision making but, like risk, varies continuously: The more complete the knowledge of each decision-maker, the more that these decision-makers will be able to quantify outcomes, impute a probability to their occurrence, and, if necessary, come to a mutual understanding.

A final question is how to put risk and uncertainty in relation to each other. A minority view is that the distinction does not matter, either because true uncertainty does not exist or because decision-makers treat risk and uncertainty the same way (Arrow, 1951; Taleb, 2010). However, this perspective ignores the rich literature on bounded rationality in decision making as well as observations regarding the different approaches to addressing risk and uncertainty reviewed above. Other work has set the level of risk aside and focused more on to what degree, and in what way, decisions may be subject to uncertainty (Dequech, 2011; Packard et al., 2017). This work effectively treats all decision-making under low uncertainty as the same, regardless of whether the variation in outcomes is high or low, i.e., regardless of the level of risk. This approach downplays the extent to which decision makers have different appetites for (or aversion to) risk (variation in possible outcomes).

In this manuscript, we treat risk and uncertainty as separate and equally important dimensions of entrepreneurial decision-making, each with its own implications for the desired decision making approaches, styles, and tools. That said, there is one critical way in which risk and uncertainty are not fully independent from each other—risk bounds uncertainty from above. For any given level of risk associated with a decision, uncertainty can vary from zero up to the level of this risk but can go no higher. This assumption captures several plausible scenarios. Suppose that the risk (or anticipated dispersion in outcomes) associated with a decision is high. In this scenario, it might often be difficult for a decision-maker to develop an accurate assessment of the probability of particular outcomes, for example, if the

decision involved a product, strategy, or market with which the decision maker had no experience (that is, uncertainty would be high). On other occasions, however, uncertainty would be low because the decision maker could ascribe probabilities. An example would be a decision regarding a risky quantitative trading or betting strategy, whose outcomes could be mathematically modeled. By contrast, suppose the risk associated with a decision is low. In this case, we would expect uncertainty to be low, as well. The reason is that if a decision-maker knows that there is a limited difference between the max and min outcomes associated with a decision, then they can also realistically place some probability on discrete outcomes or at least bound them. Finally, we acknowledge that one could consider more complex statistics about future outcomes, such as skewness and kurtosis, as well as different kinds of uncertainty, and how these related to risk. But, as with creation, we leave such refinements for future work in the interests of theoretical parsimony and because we get theoretical traction without them.

2.3 The Space Defined by Creation, Risk & Uncertainty (CRU)

We propose that creation, risk, and uncertainty comprise a three-dimensional cosmology for the universe of strategic decision-making. This framework categorizes different classes of problems and allows us to systematically develop and test theoretical predictions suggesting whether particular decision-making attributes, experiences, training, or tools will be most helpful in each region defined by this space. All decisions fall in this space. Because uncertainty is bounded above by risk, the space is a wedge, as depicted in the shaded region of Figure 1.

At the origin, where creation, risk, and uncertainty are all low, decisions are relatively simple and usefully guided by experience. (In some situations, this experience could have been acquired through trial and error specifically to inform better decision making, a point to which we return below.) These decisions are the result of routine processes and are typically mechanistic in nature. By contrast, classic entrepreneurship, like launching a high technology venture, involves decisions that are far from the origin, requiring high levels of creativity in the face of both high risk and high uncertainty. Thus, we

propose that the distribution of managerial decisions and the nature of decision-making challenges is likely to vary across the CRU space.⁵ We now turn to applying this framework.

Insert Figure 1 about here

3. APPLYING THE CRU FRAMEWORK

3.1 Reconciling Claims and Establishing Boundaries

Good theory draws connections among phenomena and exposes the underlying processes embedded in causal relationships (Bettis, Gambardella, Helfat, & Mitchell, 2014; Sutton & Staw, 1995). To develop theory strong enough to tell an accurate story about why certain behaviors, processes, and events occur, entrepreneurship researchers must carefully distinguish between neighboring concepts. In doing so, scholars will improve their readers' understanding of the systematic reasons for certain relationships within the entrepreneurial landscape and better answer the field's prevailing "queries of *why*." Moreover, for theoretical statements about entrepreneurship to communicate stated relationships clearly and parsimoniously, they must operate within a set of agreed-upon constraints and boundary conditions (Bacharach, 1989).

Our approach suggests a way to reconcile some of the most well-known claims within entrepreneurial strategy research, which nonetheless are disputed. More specifically, we highlight that if the field of entrepreneurial strategy addresses issues associated with different levels of creation, risk, and uncertainty (as described by the CRU wedge) and these different levels of creation, risk, and uncertainty generate different decision-making impediments, then different problem-solving approaches are likely to

⁵ Strategic decisions are unlikely to be evenly distributed across the CRU space. Beyond suggesting the importance of collecting data that describe the distribution of decisions, this observation suggests that decisions may exhibit correlation among the dimensions of our framework. For example, highly creative decisions may tend to be higher risk, but not always; a decision exhibiting high creativity might even reduce risk, if, say, the creativity was directed at risk mitigation or improving performance, which often takes the form of reducing variance in outcomes (Bowman, 1980). Likewise, as noted, launching a hedge fund to implement a quantitative trading strategy would often be high risk, but the uncertainty could be relatively low, given the use of mathematical tools to create and implement the strategy.

be more efficacious in different parts of the CRU wedge. Recognizing these differences allows us to illustrate how the CRU framework can address some existing disagreements and harmonize different perspectives in the field. As is the case in much of organization theory, we posit that the organizational approaches best suited to solving a particular problem are contingent on decision-making conditions. Put more simply, we posit that different entrepreneurial decision-making approaches will be favored in different regions in the figure. A further benefit of our approach is the generation of testable implications.

Decision Tools. It is long been proposed that there is something different about how the most successful entrepreneurs formulate and solve problems. Consider Steve Jobs, Howard Schultz, and Elon Musk. Each of them created a “trajectory of superior performance” for their firms by developing visionary strategies for the development of an app-based smartphone, the introduction of Italian-style espresso bars to the USA, and the production of re-usable rockets for space travel in the face of vast uncertainty (Schilling, 2018). For each of these entrepreneurs, ascribing probabilities of success at the onset of these endeavors was likely impossible, at least given human cognitive limitations. It is hard to believe that any of these individuals could have definitively predicted the success of their vision for the future at the time of their initial choices. It seems more plausible that they used cognitive processes such as *abstraction*, *idealism*, and *long paths of analytical reasoning* to predict whether future conditions would indeed support the future they imagined (Schilling, 2018). The results were that Apple developed a prototype for an intuitive user interface, Starbucks convinced early adopters to no longer view coffee as a commodity, and SpaceX designed an affordable rocket.

Scholars have developed decision-making frameworks such as “simple rules,” local search, and trial-and-error learning in an attempt to help decision-makers in these “high velocity” contexts decide quickly, coordinate with others, and capture unexpected opportunities (Eisenhardt & Bingham, 2017). Although such decision-making tools require some formalistic cognition, they generally have a stronger bias for action. They reduce highly complex decision-making contexts to simpler choice sets (e.g., test

two, choose one) and thus can be thought of as a structured heuristic, rather than a mathematical formula for which the required inputs are missing (Felin, Gambardella, & Zenger, 2020; Gans, Scott, & Stern, 2018). What is more, the trial-and-error nature of these frameworks reduces the level of uncertainty facing decision-makers by giving them feedback from the environment. Thus, paradoxically perhaps, a feature of these tools is that they make decision-making less entrepreneurial by reducing uncertainty through experimentation (Agrawal, Gans, & Stern, 2020; Gans et al., 2019).

At the opposite end of the uncertainty spectrum are decision tools like discounted cash flow analysis that rely on *probabilistically* accurate forecasts of financial results and assessments. In other words, discounted cash flow techniques apply where risk may be low or high, but uncertainty is necessarily low. Examples include expansion of an existing business line by adding to plant capacity or opening new restaurants of an established concept in a well-known market. While significant decision-making impediments may remain in these latter examples (e.g., due to non-standard assumptions regarding the shape of the underlying distribution of outcomes), given accurate inputs, these tools yield a valid and precise answer (in terms of expected value). They are thus to be preferred when uncertainty is low.

Between these extreme levels of uncertainty are decision tools that combine some elements of trial and error while not neglecting the financial data at hand. Examples are real options decision-making (Bowman & Hurry, 1993; McGrath, 1999; O'Brien & Folta, 2009), option games (Smit & Trigeorgis, 2004), option tools with ambiguity (Cartea & Jaimungal, 2017), options tools with noise (Leiblein, Chen, & Posen, 2017; Posen, Leiblein, & Chen, 2018), or scenario planning exercises. These tools are applicable where the decision-maker has incomplete data; thus, the decision-maker is at an intermediate location where uncertainty is at a moderate level (implying risk must at least be moderate, too, since uncertainty is bounded by risk) and *some*, but only some, experimentation and use of heuristics is warranted. An example would be entry by an established fast food or fashion retail concept into a new country. The fast food or fashion company would have data on other, similar markets to inform the

decision but also expect to undertake substantial adaptation after testing the local market, much as fashion retailer Zara does by starting with a flagship store in a prominent location in a new country before expanding.

Our approach therefore predicts that the most effective decision tool for evaluating a new venture depends on the decision maker's location in the CRU space along the dimension of uncertainty.

Proposition 1a. Close to the origin, where uncertainty is low, tools with predictable inputs are most effective (e.g., discounted cash flow analysis).

Proposition 1b. Far from the origin where uncertainty and thus risk are high, structured heuristics are most effective (e.g., test two, choose one).

Proposition 1c. Where the decision is associated with a moderate level of uncertainty (and thus risk is at least moderate too), tools that combine both trial-and-error and quantitative input are most effective (e.g., real options).

We note the importance of the decision maker's perspective to this proposition. As the decision-maker becomes more familiar with business conditions and the venture's performance, the perceived uncertainty and perhaps risk of the decision-making environment will lessen, with a corresponding shift from heuristics to tools with precise inputs.

Risk Attitudes. The entrepreneurship literature often describes risk attitudes in terms of risk propensity, risk tolerance, risk preferences, or risk aversion. Each of these concepts attempts to uncover a relationship between an individual's personality and the (typically high) risk conditions highlighted by much of the entrepreneurship literature. In the standard expected utility framework of risk preferences, a small subset of the population is attracted to the possibility of large gains from high-risk ventures, while the vast majority of workers exhibit aversion to risk and prefer work with regular, less variable compensation (Kihlstrom & Laffont, 1979). Moreover, when factors such as entrepreneurial ability and financing constraints are held constant, preferences over risk play a critical role in determining entry into entrepreneurship (Astebro, Herz, Nanda, & Weber, 2014). In line with this, the meta-analysis of Stewart

Jr and Roth (2001) found that entrepreneurs have a significantly greater propensity for risk than managers. For these reasons, many scholars and lay practitioners hold that entrepreneurs exhibit lower levels of risk aversion and greater risk tolerance than the general working population.

Despite these claims, the literature “has been inconclusive if not contradictory” regarding the risk attitudes of entrepreneurs compared to other populations (Kerr et al., 2017: 26). Much empirical work finds that entrepreneurs are not necessarily more risk-seeking than non-entrepreneurs but simply perceive risky situations more favorably or may have dynamic risk tolerance levels (Brockhaus, 1980; Palich & Bagby, 1995; Sexton & Bowman, 1983; Smith & Miner, 1983; Vereshchagina & Hopenhayn, 2009). Some research even finds that entrepreneurs are more risk-averse than managers and have chosen their career path for non-pecuniary reasons (Miner & Raju, 2004; Xu & Ruef, 2004).

The lack of empirical support for direct associations between risk attitudes and choices of interest such as entrepreneurial entry has led scholars to explore reasons for this conflicting evidence. For instance, Miner and Raju (2004) and Stewart Jr and Roth (2001) make evident that risk attitudes can vary between populations of entrepreneurs based on their primary goals upon entry (e.g., high-growth vs. family income). Similarly, Block, Sandner, and Spiegel (2015) demonstrate how the different motivations for entering self-employment (opportunity vs. necessity entrepreneurship) impact observed differences in risk attitudes. Despite these efforts, however, there is still no consensus regarding why or whether the risk attitudes of entrepreneurs differ from those of other populations (e.g., employees and business managers). Additionally, it remains unclear why there is so much observed heterogeneity in risk attitudes among populations of entrepreneurs. Issues related to the measurement of risk attitudes (risk perceptions vs. risks actually taken) further muddle the research landscape.

The CRU framework provides a useful lens to reconcile these mixed findings by suggesting conditions where entrepreneurial decision-makers are more or less likely to exhibit certain risk preferences. As seen in Figure 1, not all decision-making contexts said to be entrepreneurial are necessarily characterized by high, or even moderate, levels of risk. Consider the franchisee-entrepreneur.

The franchisee can, with the guidance and training of a franchisor, plan and execute a new franchise location with accurate financial forecasts that negate any additional utility derived from increased risk tolerance (low-risk aversion). In this instance, franchisees leverage data and insights the franchisor has accumulated from existing stores and experiences to reduce their risk. One could argue that a primary purpose of the franchise system is to enable business owners to insulate themselves from risk, increasing the pool of potential franchisees. By contrast, in the high creation, high risk, high uncertainty region of the CRU space into which classic, high-tech ventures fall, many famous entrepreneur-founders have exhibited behaviors suggestive of a high-risk tolerance (and low-risk aversion). For example, it is often noted that Microsoft's Bill Gates and Paul Allen dropped out of college to pursue their venture or that WhatsApp's Jan Koum dropped out of college several years before founding his venture.

In general, the CRU framework suggests that an entrepreneur's risk preferences depend on *where* they *tend* to operate in the CRU space, with higher risk locations being associated with higher risk tolerance and lower risk aversion. Thus, some very prominent classes of entrepreneurs are, as a general tendency, more risk-seeking than the general population but other classes of entrepreneurs are not.

Proposition 2: On average, those who start or operate businesses in low-risk, low-uncertainty regions of the CRU space (e.g., franchising) do not have different risk attitudes than the general working population, whereas those who start or operate businesses in high-risk, high-uncertainty regions (e.g., early entrepreneurial pioneers in personal computing) are less risk-averse than the general working population.

In a similar but different vein, it has long been argued that entrepreneurs are more confident than other businesspeople in their assessment of business prospects (Camerer & Lovallo, 1999; Chen et al., 2018; Cooper, Woo, & Dunkelberg, 1988). In support of this, Åstebro and Chen (2014) review several studies that indicate entrepreneurs both overestimate their abilities relative to others and are overly optimistic and certain in their estimates of future performance. On the other hand, others have argued that, rather than being “optimistic martyrs” (Dosi & Lovallo, 1997), entrepreneurs rely more heavily on

heuristics (Busenitz & Barney, 1997), which leads to over-optimistic situational assessments. Indeed, other scholars have found no difference between the confidence of entrepreneurs and managers in established firms (Koudstaal, Van Praag, & Sloof, 2015). As with risk attitudes, these contrasting claims raise the question of which perspective is more correct.

The CRU framework offers a plausible explanation for these mixed findings. The framework suggests that overconfidence in one's abilities or outcomes increases the likelihood of entrepreneurial entry in highly uncertain entrepreneurial environments but not in other entrepreneurial environments. The reason is that heuristics are more likely to be used (and useful) in highly uncertain environments, and the qualitative nature of the output of heuristic decision tools offers wide scope for biased—in this case, overconfident—interpretation. Otherwise, in more certain environments where formal decision tools are applicable, quantitative outputs reduce the scope for biased interpretation. For instance, with discounted cash flow analysis, the present value of a project's cash flows using an appropriate cost of capital either exceeds the cost of investment or it does not. Thus, entrepreneurs who operate in what are, from their perspective, uncertain environments, are likely to rely on heuristics and this approach is likely to manifest in overconfidence. By contrast, entrepreneurs who operate in less uncertain environments would utilize more probabilistic decision-making tools and not be more confident than others.

Proposition 3: On average, those who start or operate businesses in low-uncertainty regions of the CRU space (e.g., franchising) do not have higher self-confidence than the general working population, whereas those who start or operate businesses in high-uncertainty regions (e.g., early entrepreneurial pioneers in personal computing) do have higher self-confidence than the general working population.

Personality Traits. The Big-5 model of personality measures five traits that contain a unique set of distinguishing features (McCrae, 1987), openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism; each of these has been linked to heterogeneity in career selection and performance (John, Naumann, & Soto, 2008). Over the past several decades, researchers have used these

dimensions to claim that entrepreneurs differ from managers. Two of the big five personality traits, agreeableness and neuroticism, are found to be lower in entrepreneurs than managers, but the differences are quite small and the pattern of results in the literature is weak (Kerr et al., 2017; Zhao & Seibert, 2006). Conscientiousness, on the other hand, primarily driven by the need for achievement, strongly differentiates entrepreneurs from managers (Stewart & Roth, 2007). Our understanding of how openness to experience and extraversion, the two remaining Big 5 personality traits, apply to entrepreneurs can benefit from our framework because empirical findings are mixed.

We have argued that the cognitive process of creation is a defining attribute of entrepreneurship. Creativity has in turn been linked with divergent thinking and openness to (new) experience. Those who flourish in challenging environments by conceiving, developing, and testing novel solutions, businesses, and products are likely to be aided by increases in openness to experience. Indeed, some assert that the desire to create is a major motivation for entrepreneurship (Engle, Mah, & Sadri, 1997; Shah, Agarwal, & Echambadi, 2019). Conversely, managers are frequently typecast as choosing to operate in rigid, bureaucratic settings that stifle creativity and entrepreneurialism (Sørensen, 2007; Weber, 1947), suggesting an aversion to new experience.

Yet, the findings from the empirical literature on this point are fragile. On the one hand, meta-analysis has confirmed that, on average, entrepreneurs are more open to experience than are managers (Zhao & Seibert, 2006). But that result was associated with an 80% credibility interval that crossed zero, suggesting that the overall mean difference obscured much variation—not all comparisons between entrepreneurs and managers should yield a higher level of openness to experience for the former (Zhao & Seibert, 2006). In line with this, more recent research has found that entrepreneurs do *not* exhibit more openness to experience (López-Núñez, Rubio-Valdehita, Aparicio-García, & Díaz-Ramiro, 2020).

Similarly, there are mixed findings regarding whether entrepreneurs are more extraverted than business managers are as well as whether any differences in extraversion affect performance outcomes. Extraversion measures how enthusiastic, energetic, dominant, active, and talkative an individual is

(McCrae, 1987). While it is possible that the need to persuade stakeholders regarding the value of innovations and other novel business practices implies that extraverted individuals may be successful entrepreneurs, no consistent difference in extraversion between entrepreneurs and non-entrepreneurs has emerged in the literature (Zhao & Seibert, 2006). Research on small business owners has shown that some entrepreneurs may even be *less* extraverted (more introverted) than the typical business manager. As an example, Envick and Langford (2000) provide evidence that individuals who enter self-employment from home do so to escape coworker interactions.

One could argue that personality differences across entrepreneurial populations is a topic where the chosen definition of the entrepreneur is particularly consequential. After all, venture capital-backed start-ups in Silicon Valley differ significantly from “mom and pop” small businesses, yet both are often considered forms of entrepreneurship. The CRU framework offers an explanation for these conflicting personality findings without the need for a singular definition of the entrepreneur. Individuals who operate in high creation regions of the CRU space, producing truly innovative products such as new forms of internet commerce, novel technologies, and new social media, will tend to be open to experience for the reasons stated above: they are enacting the new experience of which they are a part. These entrepreneurs will benefit from the ability to enthusiastically communicate their ideas with thousands of individuals so as to attract the human, social, and financial capital required for a successful exit. Therefore, they are likely to be highly extraverted, as well, at least in professional settings.

However, many entrepreneurs do not operate in a high creation region of the CRU space. For instance, some families, extended families, and communities strongly establish themselves in certain industries in particular regions. Someone from such a family background who takes a job in the relevant industry is not engaged in a creative process or showing much openness to new experience. If said person ultimately goes on to open their own business in the relevant industry, they would be following a well-established recipe for success, the parameters of which are well-known in their community. There is no reason to believe said entrepreneur would score highly on openness to experience. Additionally,

extraversion would not predict positive venture outcomes for decision-makers in these settings because attracting significant and numerous stakeholders to novel ideas would not be a necessity for survival; their community is already there to serve as a source of needed resources.

Proposition 4: On average, those who start or operate businesses in low-creation regions of the CRU space (e.g., an individual with deep social ties to a particular industry) are not more open to experience than the general working population, whereas those who start or operate businesses in the high-creation region (e.g., novel technologies) are more open to experience than the general working population.

Proposition 5: On average, those who start or operate businesses in low-creation regions of the CRU space (e.g., an individual with deep social ties to a particular industry) are not more extraverted than the general working population, whereas those who start or operate businesses in the high-creation region (e.g., novel technologies) are more extraverted than the general working population.

3.2 Entrepreneurship Concepts without a Singular Location in CRU Space

We now consider important concepts in the entrepreneurship literature that do not have a well-defined location in the CRU space. In particular, they do not have first-order effects on the nature of decision-making in terms of the information sets available or the methods that should be applied. This does not in any way reduce their importance. To the contrary, the lack of a clear location in CRU space means they are important across the entire field of strategy, even in domains not traditionally associated with entrepreneurship. It also means that these concepts cannot serve as touchstones for determining whether an entrepreneurial approach to decision making will be especially useful.

Risk-bearing and Ownership. Many have argued over the years that bearing risk as a residual claimant is a *sine qua non* of entrepreneurship. Some articles even define entrepreneurs as those (founders) who bear risk (Kihlstrom & Laffont, 1979; Vereshchagina & Hopenhayn, 2009) or are residual claimants (Hollander, 1903). No doubt, a long tradition of scholarship has studied the separation of ownership and

control (Berle & Means, 1932; Jensen & Meckling, 1976), i.e., agency theory, showing that it is an important factor in the organization of human affairs, including in venture capital contracting (Kaplan & Strömberg, 2003). And yet, however much *de alio* and *de novo* entrants may differ in terms of internal organization and performance (Ganco & Agarwal, 2009), such governance and firm boundary choices may be determined more by considerations of value capture than of value creation (Kaul, 2013). Indeed, large, existing firms are a major source of creativity, innovation, and dare we say entrepreneurial activity. Consider that Apple introduced the iPod, iPhone, and iPad decades after its founding in 1976. Similarly, Google (renamed Alphabet) is at the forefront of innovation in human health, self-driving automobiles, and artificial intelligence.

As another example of the insufficiency of risk-bearing and ownership to determine the nature of strategic decision making, consider the cases of Ryanair and Delta Song. Ryanair's initial entry into low-cost air travel failed in large part because its service was not sufficiently differentiated from those of British Airways and Aer Lingus. It was only when Ryanair differentiated away from these full-service carriers into ultra-low frills travel that Ryanair achieved its current levels of commercial success. The failure of Delta Song, the entry by the full-service carrier Delta into low-cost air travel between Florida and the US Northeast, may have failed in part because its attempt to differentiate as a targeted-frills airline for budget-conscious women was focused on too small a market niche. As this example illustrates, the same entrepreneurial decision-making techniques of experimentation and discovery were appropriate for Delta and Ryanair, even though the Delta managers undertaking them were "stewards" of the shareholders' money and not residual claimants themselves (beyond whatever tiny fraction of the company the top management may own).⁶

Essentially, the separation of ownership and control implies two forms of judgment: *original judgment*, which belongs to owners, and *derived judgment*, which belongs to non-owners who serve as

⁶ Perhaps from the perspective of finance or staffing (external versus internal sources), it may have mattered that Ryanair was run by founder-managers and Delta Song was not, but from a decision-making perspective, it did not.

proxy-entrepreneurs (Foss, Foss, & Klein, 2007). Yet, in either case, original or derived, the issue is where this judgment is exercised in the CRU space. Bearing risk as an equity investor and strategic decision-making are two distinct roles in firm governance. The same person can do both but need not.

Entering Self-Employment. Self-employment represents another commonly used context and criterion to denote entrepreneurship used in academic research (e.g., Hamilton, 2000; Levine & Rubinstein, 2019; Parker, 2009) and government policy documents (e.g., US Department of Labor, 2022). However, it is unclear whether self-employment status is more entrepreneurial than other forms of business activity from a strategic perspective, even if for, say, tax and accounting purposes, it is a key variable.

Consider an individual employed as an electrician by a local electrical contracting business but then laid off. The individual begins earning non-wage income through the completion of minor electrical projects that their prior employer no longer services. The decision to enter self-employment in this example would involve low amounts of creation (few new processes or products are developed), low risk (the variance in outcomes associated with servicing minor electrical projects would be small), and low uncertainty (the potential outcomes of pursuing small projects from known clients would be predictable). Therefore, in this case, the choice to enter self-employment would be mapped close to the origin in the CRU space. Indeed, even if the individual entered self-employment entirely out of a desire to be their own boss, it would still be close to the origin in Figure 1. Importantly, little differentiates the decision making of this person when they are working as an employee or as a self-employed individual. Being one's own boss is a lifestyle decision (Bennett & Chatterji, 2019), one that is clearly important to career planning, but which could be effectuated by buying an existing company and hiring someone to run it.

By contrast, consider a licensed heating, ventilation, and air-conditioning (HVAC) contractor who maintains wage employment with a large construction company that is not interested in pursuing medium-sized contracting jobs associated with smaller construction projects. The HVAC contractor in this example recognizes an opportunity in the marketplace to apply the knowledge they have developed during wage employment by bidding on medium-sized projects considered too small by their employer.

Energized by this opportunity, they depart the larger firm and incorporate a small business. In this instance, the HVAC contractor's decision to enter self-employment involves moderate to high creation (new processes are developed and new employees must be hired), moderate to high risk (the variance in outcomes ranges between complete failure and a growing profitable business), and moderate to high uncertainty (the lack of business ownership experience implies many of the potential outcomes they will face remain unknown or hard to quantify probabilistically). In the HVAC case, self-employment would be mapped further from the origin in the CRU space than in the electrical contracting case.

In short, self-employment may or may not involve high or low levels of creation, risk, or uncertainty. Conflate the self-employed who operate in different regions of the CRU space is likely to muddle our understanding of them, because they will differ so much in their personality attributes and decision making approaches.

Bricolage and Bootstrapping. The literature has often connected bricolage, essentially making do with resources at hand because standard channels of procurement are unavailable, with entrepreneurship (Baker & Nelson, 2005; Fisher, 2012; Welter, Mauer, & Wuebker, 2016). Undoubtedly, many new firms engage in some form of bricolage. Steve Jobs and Steve Wozniak famously started Apple Computer from a garage. But making-do by repurposing slack resources (including human capital) to new, profitable uses is also the cornerstone of Penrosian growth in large firms. Moreover, established firms going through a restructuring or financial distress frequently engage in similar behaviors. Thus, bricolage-type behaviors are also known among established businesses.

By the same token, bootstrapping, essentially economizing and tapping non-standard sources of financing, such as using personal credit cards, sharing office space and equipment across businesses, and so on, has also been linked with entrepreneurship (Winborg & Landstrom, 2001). As with bricolage, however, bootstrapping is also common among established firms facing financial distress. Moreover, recent empirical work challenges the notion that new ventures are in general cash constrained by presenting evidence that increases in liquidity or the value of collateralizable assets generally do not

facilitate increased entry (Hurst & Lusardi, 2004; Kerr & Nanda, 2011; Kim, Aldrich, & Keister, 2006; Lofstrom, Bates, & Parker, 2014). Finally, although many of the businesses whose bootstrapping tactics Winborg and Landstrom (2001) analyze are small, they are not necessarily focused on growth or innovation. They are just trying to survive.

From the standpoint of entrepreneurial decision making, neither bricolage nor bootstrapping seem related to risk or uncertainty, and those attributes would only be high if the firm itself was operating in a high risk or high uncertainty part of the CRU space for other reasons (e.g., its industry). Bricolage and bootstrapping could well involve high levels of creation if a high level of creative thinking was required to effectuate a particular form of these behaviors. Some of the examples detailed by Winborg and Landstrom (2001) and Baker and Nelson (2005) do indeed have that character. But bricolage and bootstrapping need not always exhibit high creation; consider repeatedly sharing a capital good or borrowing on a personal credit card. Indeed, a student might share an expensive textbook or borrow on a personal credit card to pay for school, a decision not usually considered to be entrepreneurial.

In short, although bricolage and bootstrapping may be associated with entrepreneurship in some contexts, and are surely worth studying as viable means of financing businesses for which formal channels of raising capital are unavailable, they do not necessarily apply to a particular region of the CRU space and thus do not bear on strategic decision making per se.

Firm Age. A long intellectual tradition links firm age with firm conduct and performance. Younger firms, especially new ventures, are thought to be more dynamic but also exhibit a “liability of newness” (Stinchcombe, 1965). In practitioner circles, it is often debated how long after founding that a new venture can be considered a start-up, or how long after a firm’s founding the founder of the firm can be considered an entrepreneur. We associate older and larger firms with bureaucracy and causal decision processes (Sarasvathy, 2001; Sørensen, 2007).

We do not dispute the general tendencies documented in the organizational ecology and other literatures, but there is a difference between a tendency and a determining factor. We have provided

examples of large, established companies taking highly entrepreneurial decisions. Perhaps, an even more striking example is that of DeBeers, which was founded in 1888 and dominated the diamond industry for a century. In essence, DeBeers controlled supply and forward integrated from mines through site holding, up to but not including retail. It developed and purchased innovative advertisements for the diamond industry that built upon different countries' cultural traditions, punished producers that did not cooperate with the cartel by selectively releasing stones from its stockpile that matched the color and size of the offending producer's diamonds, and created a system (the four Cs) for determining diamond "quality." Yet, in the 1980s and 1990s, the collapse of the Soviet Union and the opening of new mines in Australia and Canada caused DeBeers to lose control of supply. After a decade of value destruction, the company, with the help of Bain Consultants, completely rejigged its strategy as the "supplier of choice": Henceforth, DeBeers would be a conventional luxury goods firm, advertising for itself under the DeBeers name, operating a network of retail outlets with luxury goods behemoth LVMH, establishing a system for verifying the conflict-free status of diamonds using block chain technology, and, quite surprisingly, launching its own line of synthetic diamonds. This was an incredible strategic transformation involving high levels of creation in the face of significant risk and uncertainty, by a company over a century old.

By contrast, in 2016, Philips Electronics spun off its lighting division as Signify. Signify was an entirely new firm, yet it continued to follow the same strategy as it previously had, with the same management team, while operating under the Philips Electronics' brand name. Signify is a market leader in lighting, but operating independently has not in any meaningful way moved it away from the origin in the CRU space. Being "young" does not make Signify entrepreneurial in a strategic sense. DeBeers was far more entrepreneurial, at least as defined by the CRU framework, when it re-invented itself.

4. DISCUSSION

It is well known that scholars have generated many different conflicting definitions and competing claims with regard to entrepreneurial strategy. If we remain "divided by a common language" wherein the same words mean different things and for different ends, then conceptual confusion will injure further theory

development, pedagogy, and eventually practice. To alleviate confusion, it is helpful to dimensionalize attributes of the decision so as to help theoreticians understand the root causes of their conflicting claims and empiricists studying entrepreneurship to differentiate their variables and “stylized facts” along well-defined features.

To bring order to the disorder and facilitate future knowledge accumulation, we have proposed the CRU framework as a means of organizing the decisions most often explored within entrepreneurial strategy along the dimensions of creation, risk, and uncertainty. As noted throughout, our purpose is not to exclude but rather to explicate how the many emergent and ongoing streams of literature in the burgeoning literature on entrepreneurship fit together, in particular, where their boundary conditions lie and where they intersect.

We note also that our theory is robust to differing views on the appropriate dimensions of the space of strategic decision making. We treated uncertainty and risk as distinct constructs, following a long tradition. But some scholars, especially those with a strong economics orientation, may not accept that true uncertainty as we have defined it ever really exists. For these scholars, a decision maker can always implicitly ascribe probabilities to possible outcomes. Although we do not necessarily agree with this perspective, we note that in principle one can preserve our theory largely intact even if one collapse risk and uncertainty into a single dimension. Then, our prediction that experimental entrepreneurial decision-making tools (e.g., test two, choose one) would be most applicable in high uncertainty regions would instead be most applicable in high risk regions. Conversely, some scholars may believe it is important to subdivide uncertainty into different types. If so, the CRU wedge would have four or more dimensions, and it would be necessary to map the utility of entrepreneurial decision making tools to different types of uncertainty. We believe that digging more deeply into these sub-dimensions of entrepreneurial decision-making is a fruitful area for future research.

Implications for Theory and Empirical Regularities

A key implication of the CRU framework is that theories about entrepreneurial decision-making and actions are circumstance contingent. In highlighting this possibility, our essay brings attention to a common recommendation for most new theories—to provide well-defined boundary conditions beyond which the theory would not apply. Likewise, our essay implies that empirical researchers who document “facts” about entrepreneurs in isolation or vis-à-vis other populations should anticipate and confirm boundary conditions beyond which the empirical regularity will no longer hold.

Our overarching claim is that research is more likely to benefit from the unique theoretical mechanisms and empirical findings on entrepreneurship when they are precise about the levels of creation, risk, and uncertainty involved. Thus, for instance, a study of new business formation or closure would be best informed by a theory that applies to all market entry and exit, without regard to the level of risk or uncertainty of the decision-making environment. Conversely, an ethnographic study of a new venture in a creative industry would need to incorporate the high-risk, high-uncertainty nature of the decision-making in that space, as well as the tendency of entrepreneurs in such industries to apply decision-making heuristics. We contend that acknowledging the underlying purpose and assumptions of these research questions upfront will make it easier to postulate boundary conditions on theoretical and empirical claims at the outset, rather than claiming, implicitly or explicitly, to make a statement about entrepreneurship writ large, as so much research has done.

Testable Empirical Implications

This manuscript argues that important and under-emphasized contingencies exist across entrepreneurial problems. The CRU framework leads directly to many testable empirical questions. For example, explicating the CRU space raises a question regarding whether strategic (or non-strategic) decisions are evenly distributed across the CRU space. Several additional claims that could be the subject of empirical inquiry are already laid out in the manuscript in the form of propositions. For example, our claim that

entrepreneurs who operate in the high creation region of the CRU space will tend to be more open to experience than those who operate in lower creation regions of the space is clearly testable.

One of the interesting implications of our study regards the nature of the empirical studies required to test these propositions. As highlighted by McGrath (1981), all research methods involve tradeoffs against desiderata such as generalizability, measurement precision, and realism. The distinctions between creation, risk, and uncertainty highlighted in our manuscript suggest that judgment tasks and experiments may be particularly useful when testing our propositions. For example, future work might test the associations proposed by our theory by examining whether the use of particular decision-tools aids in the completion of paper and pencil judgment tasks or competitive games that vary in creation, risk, and uncertainty. It might also be informative to study decision-makers “in the wild” to examine whether and how the approaches and tools they utilize differ across the types of decisions highlighted by our framework.

Managerial Implications

Our advice to would-be and actual entrepreneurs is, “Know where you and your venture are in the CRU space!” The tools you learned in your entrepreneurship courses or the advice you just read in your favorite business publication may or may not have you or your venture in mind. If the management challenge is to choose the appropriate decision-making tools for the problem at hand, the CRU framework provides a guide to identify when particular tools or approaches are most likely to be useful.

Undoubtedly, it may be affirming to the soul to liken oneself to famous entrepreneurs like Elon Musk and Steve Jobs, but practitioners need to be honest with themselves about whether they even aspire to enter the high creation, high risk, high uncertainty region of the CRU space that these individuals inhabit. There is a big difference between opening your own accounting boutique and an Internet enterprise. Ventures in regions of the CRU space closer to the origin will, in general, be better served by the application of more traditional decision-making frameworks and financial planning tools.

Conclusion

We acknowledge that our effort has limitations. In particular, whereas we focused on entrepreneurship from the perspective of strategic decision-making, scholars from other fields may find different dimensions of entrepreneurship more useful for defining the boundaries of the field. We also did not focus herein on the boundaries of managerial decision-making itself. In that regard, some scholars have taken an expansive view of entrepreneurship as *any* pursuit of rent (Baumol, 1990), and social entrepreneurship continues to push the boundaries of entrepreneurship into the non-commercial realm (Short, Moss, & Lumpkin, 2009). To these and other scholars with similar interests, we ask how far can we extend our theories? Consider someone who closely follows fashion trends and has a following on social media. Would it be entrepreneurship if this person devises a bold new look (creation) and wears it at an important social event in the face of potentially divergent reactions from peers (social risk and uncertainty)? In the spirit of this paper, we would answer Yes, but as a practical matter, the decision of this hypothetical fashion “influencer” is unlikely to garner much scholarly or pedagogical attention in modern business schools. This issue merits further theoretical attention.

We believe that leveraging the concepts of creation, risk, and uncertainty advances the field by providing a sandbox in which scholars with different theoretical lenses, empirical contexts, and disciplinary orientations can play harmoniously. Neither entrepreneurial strategy nor the field of entrepreneurship writ large can reach its potential until each of its empirical and theoretical claims is understood by its originators and audience as fitting into a larger whole. More research is needed on how entrepreneurship’s constituent bodies of knowledge cohere into the greater field. In this paper, we have offered a starting point for those efforts.

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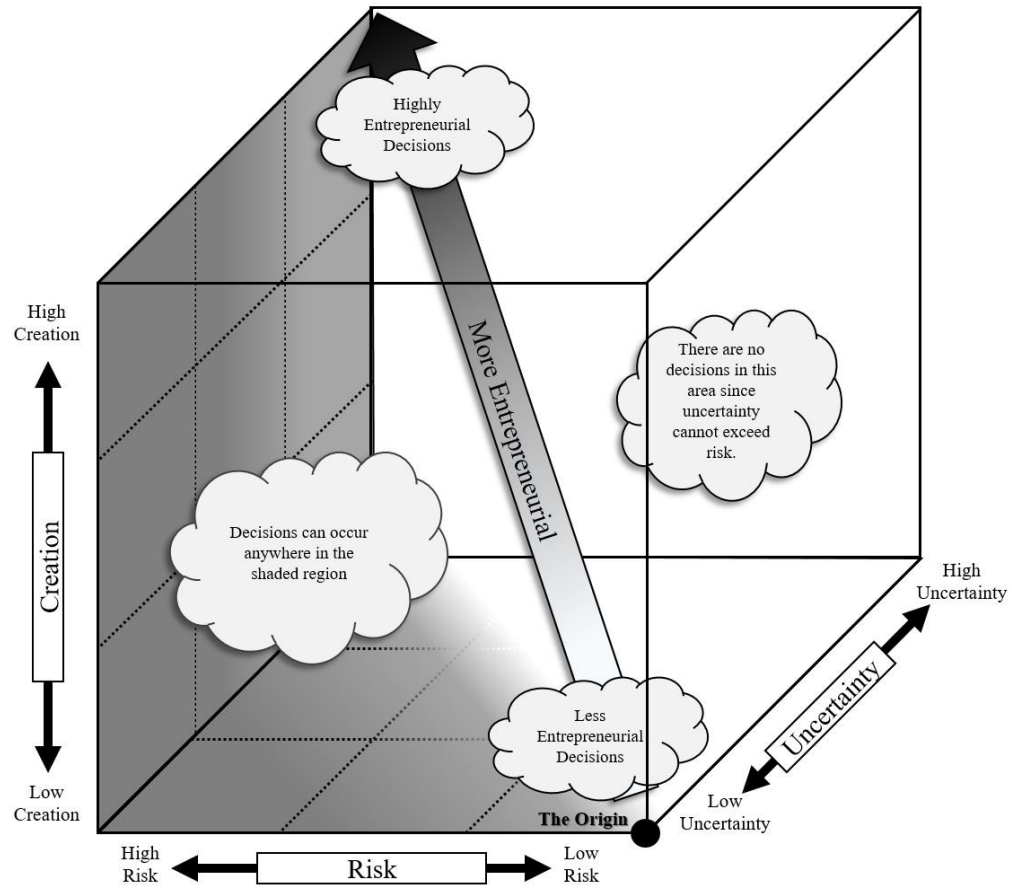
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FIGURE 1
Creation, Risk & Uncertainty: A Three-Dimensional Framework for Managerial Decisions



Note: The "Wedge" can be found in the shaded region of the three-dimensional space