

Navigating the Fog: A Research Agenda for the Land of Unknowingness¹

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Draft Comments for the Utah Strategy Summit 2024 panel on Knightian uncertainty

Abstract

This essay outlines a research agenda that aims to ascertain whether and how strategic and nonstrategic approaches to decision-making can be useful in worlds characterized by Knightian uncertainty and other forms of “unknowingness.” The essay introduces the concept of “uncertainty regimes” and defines this concept in terms of a landscape of varying levels of risk (variation in outcomes) and uncertainty (variation in ability to quantify outcomes in a probabilistic manner). The essay then proposes a series of research questions that aim to frame a research agenda that explores the ramifications of “uncertainty regimes” in terms of how managers choose strategic and non-strategic frameworks, theories, and tools, and the degree to which these approaches enhance firm value creation and capture.

¹ This essay has benefited from prior work with Jarrod Humphrey and David Gaddis Ross and recent conversations with Tammy Madsen and David Ross.

Introduction

How is strategic management useful in a world of Knightian uncertainty? The very question used to organize this panel suggests that in contexts characterized by Knightian uncertainty, where the probability of outcomes cannot be quantified, the relevance and utility of strategic management research frameworks, theories, and decision-making approaches are in question.

Some work has already begun to address how Knightian uncertainty affects decision-making. Building on calls to “take uncertainty seriously” (e.g., Alvarez et al., 2020: 169), some scholars have offered refined definitions and measures of Knightian uncertainty (e.g., Packard; Townsend, Hunt, McMullen, & Sarasvathy, 2018). Others have proposed potential solutions to the decision-making challenges in these complex environments emphasizing the importance of good theory (e.g., Felin and Zenger, 2017; Ehrig & Schmitt, 2023), good experiments (e.g., Camuffo, Gambardella, and Pignatora, 2023), and processes to allow the firm to efficiently adapt and shape the environment (e.g., Rindova and Courtney, 2020).

While the above research provides arguments and evidence advocating for specific methodologies for addressing decision-making under Knightian uncertainty, this essay suggests a different approach. The proposed approach builds upon two assumptions. First, it is fruitful to consider how combinations of Knightian uncertainty and riskiness, or “uncertainty regimes”, affect decision-making. Second, that the “strategy adjective” is meaningful. While strategic management is an interdisciplinary field that has borrowed concepts from disciplines and other fields of study, there is a distinctive “strategy ethos” or set of “strategy methodologies” that provide valuable insights that differ from those provided by disciplines or other fields of inquiry. Ultimately, this distinctive strategic ethos provides a “systems-level” interpretation of the firm.

Thus, strategic management suggests a means to provide value-enhancing “coherence to organizational action” (Rumelt, 1980:20).

This essay aims to outline a research agenda that may help the strategic management field consider, discuss, and debate the definitions and implications of various uncertainty concepts and definitions of strategic management. More specifically, it suggests a research agenda that compares the value of specific (strategic and non-strategic) approaches to management under different uncertainty regimes. The goal is to leverage the inter-disciplinary and multi-functional nature of strategic management research and compare the usage and outcomes associated with prominent frameworks and mental models (e.g., 5 Force Framework or Resource-based view), theories (e.g., the behavioral theory of the firm, value-based strategy, real options), and decision-making approaches (e.g., the structured logical thinking of Barbara Minto and the intuitive and critical thinking of Kenichi Ohmae; the theory-based view of Teppo Felin and Todd Zenger and the types of experimentation espoused by Arnaldo Camuffo and Alfonso Gambardella) across uncertainty regimes. The essay recognizes that all these approaches suggest ways to enhance managers’ ability to create and capture firm-specific value. However, to the extent they utilize different definitions of risk and uncertainty, they are likely to yield different outcomes under distinct uncertainty regime conditions. As a result, comparisons across regimes should clarify when one approach is more fruitful than another. Perhaps of greater value, such comparisons may provide a means to address concerns regarding the fragmentation (Durand, Grant, and Madsen, 2017) and/or Balkanization (Schoemaker, forthcoming) of strategy scholarship.

The essay proceeds as follows. The next section discusses the concept of Knightian uncertainty as well as other forms of unknowingness. The key claim is that it may be useful to think about combinations of levels and types of unknowingness and the challenges associated

with these uncertainty regimes. The essay then reviews prominent statements regarding the distinctive contributions of strategic management in terms of its relevance vs. other fields of study, its historically central questions, tradeoffs, and types of decisions. This review motivates a list of prominent frameworks/mental representations, theories, and decision-making processes that may help guide decision-making. The essay concludes with some tentative statements that aim to suggest the salience of these prominent methodologies in different uncertainty regimes.

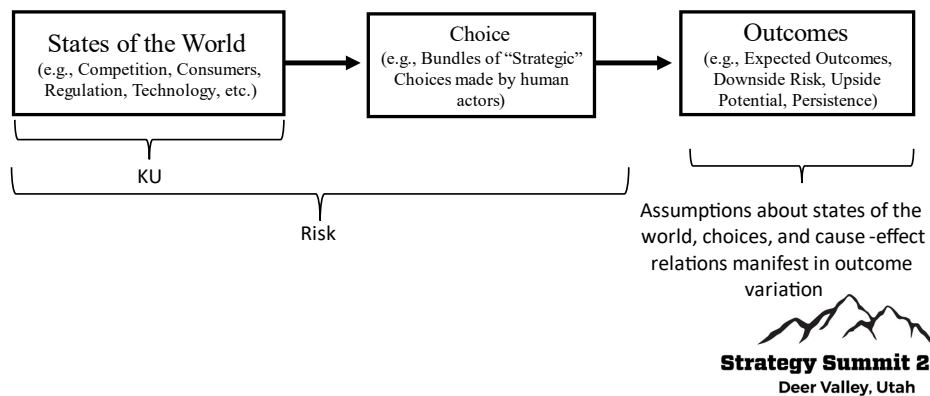
Risk, Uncertainty, and Uncertainty Regimes

To assess whether and how strategic management is useful in a world of Knightian uncertainty, it will be helpful to clarify the source of unknowingness in this essay and state how Knightian uncertainty relates to other forms of confusion, ignorance, and unknowingness.

To clarify the source of unknowingness and analyze how strategic management might be useful in a world characterized by unknowingness, this essay assumes a simple situation involving a stimulus, choice, and response (see Figure 1). In the figure, the state of the world provides a stimulus that may lead to a bundle of choices by a management team, and a variety of potential outcomes. Related ideas depicting simplified problem formulation and solution processes have been shared broadly in the academic and practitioner literature and used to demonstrate logical and highly structured decision-making approaches (e.g., Chevallier, 2016; Minto, 1990; Ohmae, 1978) as well as a broader cognitive process that involves analyzing, evaluating, and synthesizing information to form a reasoned judgment (Nutt, 1984; Mitroff & Silvers, 2009; Cummings & Nickerson, 2021). This may be compared to comments in the uncertainty literature. For example, citing Knight (1921), Townsend, Hunt, McMullen, and Sarasvathy, (2018) note that Knightian uncertainty manifests through actor ignorance, practical indeterminism, agentic novelty, and competitive recursion.

The figure suggests that there may be incomplete knowledge regarding the stages or the causal linkages between the stages depicted in the figure. There is “unknowingness” about the states of the world, the likelihood that a boundedly rational team will choose the appropriate course of action, and the effect of the states of the world and one’s choices on outcomes. While not depicted, expectations regarding outcomes also affect choice. That is, uncertainty is a feature of the decision context and risk can be both a feature of the choice, the context, and the linkages between the choice and context. These general sources of unknowingness manifest in risk and uncertainty in outcomes.

Figure 1: The location of risk and uncertainty in a simple model



Existing research clearly defines various sources of unknowingness, such as behavioral, technical, causal, and outcome-based (e.g., Arend, 2024; Foss and Klein, 2012; Packard, Clark, and Klein, 2017). It also categorizes unknowingness into types, including treatable and untreatable (Arend, 2024; Ehrig and Foss, 2022).² While the existing literature has developed

² The concept of unknowingness is a central element of many long-standing strategic management frameworks and tools. For example, well-received research draws distinctions between sources of unknowingness in market or

many precise definitions of unknowingness, these definitions remain somewhat disjointed. For example, Arend (2024) lists over two dozen distinct terms to define various forms of unknowingness.³ The number and variety of forms of unknowingness suggest it may be useful to develop an overarching categorization of unknowingness that may be used to organize how to think about the decision-making context and consider how strategic management aids decision-making in settings characterized by Knightian uncertainty or other forms of unknowingness. Thus, the purpose of this essay is not to summarize or extend the intricate arguments developed in the existing literature but rather, to propose a simple categorization that may help identify the circumstances where existing strategic decision-making approaches are most valuable.

It is appropriate and important to note that others have made similar observations regarding the importance of distinguishing between forms of “unknowingness.” For example, Courtney (2001) provides several examples of business decisions at various levels of residual uncertainty and argues that certain strategic management decision-making tools are most effective at different levels of uncertainty. Arend (2024) emphasizes the distinction between treatable and non-treatable forms of unknowingness and suggests how various heuristics and decision-making approaches may address these forms of unknowingness.

technological knowledge (e.g., Wernerfelt and Karnani, 1987), emphasizes the impact of unknowingness at different levels of analysis such as the individual, the firm, or the market level (e.g., Schoemaker, 1993), and highlights distinctions between levels of unknowingness ranging from low to high (e.g., Courtney, 2001).

³ Arend (2024: 250) lists over 30 labels and types of “uncertainty” including ... “variability, imperfect information, obscurity, vagueness, ambiguity, incomplete knowledge, chance, chaos, volatility, disorder, entropy, the unknown, randomness, turmoil, stressor, error, dispersion, unknowledge, a lack of information to make sure that may or may not be rectified in the future, complexity, turbulence, novelty, equivocality, luck, unknowingness, unpredictability, dynamism, and uncontrollability. Other adjectives to describe different types of uncertainties include Knightian uncertainty, primary uncertainty, deep uncertainty, absolute uncertainty, creative uncertainty, environmental uncertainty, and so on.”

This essay proposes thinking about unknowingness in terms of “uncertainty regimes” defined by different levels of Knightian uncertainty and different levels of riskiness. The concept of “uncertainty regimes” recognizes that almost every business decision, except for the simplest and most routine ones, leads to outcomes that range from highly successful to extraordinarily unsuccessful. This range of outcomes stems from both contextual variation (e.g., intermediate outcomes such as customer acceptance of a new product as well as exogenous events such as the 2024 software malfunction that grounded much US air traffic) as well as the quality of decision-making. This range of outcomes, known for its impact on decision-making processes, has been a recognized factor in decision-making in general (Rabin & Thaler, 2001) and entrepreneurial decision-making in particular (Knight, 1921: 118).

While the appropriate way to interpret this range of outcomes and how it affects decision-making has been debated for over a hundred years, two key elements remain at the forefront. The first is the extent of the range itself, often measured as the fluctuation around an average value, such as the standard deviation compared to the mean. In disciplines like economics (Armour & Teece, 1978), finance (Eugene & French, 1992), and management (Ross, 2014b; Ruefli, Collins, & Lacugna, 1999), this fluctuation is commonly referred to as "risk" or "volatility." Many influential theories propose that this conventional view of risk shapes our decision-making strategies (Rabin & Thaler, 2001). For example, Hardy and Maguire (2016) describe several risk reduction methodologies, such as diversification, hedging, and risk assessment. These methodologies, along with others, typically rely on historical knowledge to inform future actions (Eisenhardt & Martin, 2000).

The second important aspect of variation in possible outcomes refers to the degree to which potential outcomes may be quantified 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, it may be unclear to the decision-maker what outcomes to expect or how to categorize them (Langlois & Cosgel, 1993), or even how they might feel about these outcomes in the future (Rogotti & Shannon, 2005). Moreover, even when outcomes are known, it may be difficult to assess the chances of particular outcomes occurring. For example, “a market” might not (yet) exist, or if it does exist, its participants might struggle to gauge probabilities and assign value to particular outcomes (Demsetz, 1988; LeRoy & Singell Jr, 1987). In these settings, the degree of uncertainty varies in a continuous fashion.⁴ Humphrey, Leiblein, and Ross (2024) provide a similar perspective on the nature of risk and volatility.

Although probabilistic (or expected utility) reasoning is assumed in many economic decision-making models (e.g., Ching, Gans, & Stern, 2019; Ross, 2014a, b), the combinations of types and levels of risk and uncertainty can vary greatly among business problems. For example, an endeavor that relies on an innovative but yet-to-be-tested technology might face a wider range of potential outcomes as compared to one utilizing established technology. The amount of uncertainty in decision-making can also differ. 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

⁴ A potentially interesting point regards how Knightian Uncertainty, defined as a type of uncertainty where the probability of outcomes cannot be calculated or reliably predicted *differs* from a uniform distribution with infinite bounds (or an infinite series of uniform probability distributions, each with infinite bounds).

Definitions of Knightian uncertainty as a context where it is impossible to write an outcome probability distribution imply a discrete state. Adopting this definition implies that *any* small amount of knowledge generated via experiment, learning, or theoretical development sufficient to develop a rudimentary outcome probability distribution would convert Knightian uncertainty into risk. This appears to be an overly restrictive and not particularly fruitful definition to help understand the challenges implied when relatively little is known about the outcome distribution (or the combinations of risk and uncertainty).

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 regards the relationship between risk and uncertainty. 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 view ignores the rich literature on bounded rationality in decision-making as well as observations regarding the different approaches to addressing risk and uncertainty.

A separate stream of research has set the level of risk aside and focused more on to what degree, and in what way, decisions may be subject to uncertainty (Courtney, 2001; Dequech, 2011; Packard et al., 2017). This stream of research will often discuss outcomes on a single continuum ranging from “certain” to “risky” to “ambiguous” to “uncertain.”⁵ This work effectively treats all decision-making under low uncertainty as the same, regardless of the level of risk, and downplays the extent to which decision-makers have different appetites for (or aversion to) risk (variation in possible outcomes) as well as the varying assumptions that underlie specific approaches to guide decision-making in these complex situations.

This essay treats risk and uncertainty as separate and equally important concepts. Observations of business and economic situations that simultaneously exhibit elements of both risk and uncertainty suggest that this assumption is plausible. For example, a firm contemplating entry into a new market may face both measurable risks (e.g., currency fluctuations or interest

⁵ Risky contexts can be described by a single well-defined outcome probability distribution (e.g., Perold, 2004), ambiguous contexts can be described by multiple well-defined outcome probability distributions where it is unclear which specific distribution is appropriate (e.g., Ellsberg (1961); Nishimura and Ozaki (2007)), and uncertain contexts can be described as situations where it is not possible to define an outcome probability distribution.

rate risks) and uncertainties (e.g., regarding future market demand or regulatory change). Similarly, a firm developing a radical new product may face estimable risks (e.g., cost overruns or technical failures) and uncertainties (e.g., consumer acceptance or competitive responses). The P&G experiments with their Oil of Olay products (see Foss, 2024 for one description) provide a concrete example of this phenomenon. That said, it is important to note one critical way in which risk and uncertainty are interconnected—risk-bounds uncertainty from above. As it is difficult to imagine a highly uncertain situation where there is limited risk (or variation in outcomes), the analysis assumes such outcomes are impossible or, at least, infeasible.

Recognizing the associations and interactions between risk and uncertainty captures several plausible scenarios. Suppose that the degree of risk (or anticipated dispersion in outcomes) associated with a decision is high. For example, consider a decision regarding a product, strategy, or market with which the decision-maker had no experience (that is, uncertainty would be high). In this scenario, it may be difficult for a decision-maker to develop an accurate assessment of the probability of particular outcomes. On other occasions, however, uncertainty would be low because the decision-maker could ascribe probabilities to an event. A concrete example would be a decision regarding a risky quantitative trading or betting strategy, whose outcomes could be mathematically modeled. As a contrasting alternative, suppose the risk associated with a decision is low. In this case, it is reasonable to expect that uncertainty will 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. After all, at the very least, the decision-maker can place bounds on the expected outcomes. Finally, we acknowledge that one could consider more complex statistics about future outcomes, such as skewness and kurtosis to capture concepts such

as upside potential or downside risk, as well as different kinds of uncertainty (e.g., aleatory), and how these related to risk.

Figure 2 depicts two conceptions of the decision-making space. The image on the left depicts discussions that assume risk and uncertainty lie on a single continuum of “unknowingness.” This continuum ranges from narrow contexts where there is no variation in outcomes (certainty) to contexts where there is a limited range in outcomes (risky) to contexts where there is infinite variation in outcomes (uncertainty). While the left panel draws attention to the different levels of unknowingness on this continuum, it relegates risk and uncertainty to separate levels of unknowingness and arguably “blurs” the boundaries between risk and uncertainty. We’re left thinking about Knightian uncertainty as an “extreme” case (c.f., the concepts of zero and infinity in mathematics where calculations are performed at the limit), the possibility of a context involving both risk and uncertainty is ignored, and, arguably, the boundaries between the decision-making challenges implied by risk and uncertainty are blurred.⁶

In contrast, the image on the right highlights the distinct attributes of risk and (Knightian) uncertainty and allows their degree to (largely) vary independently over the decision-making space. The degree of riskiness is depicted by levels of variation ranging from narrow contexts where there is limited variation in outcomes to contexts where there is infinite variation in outcomes.⁷ The degree of uncertainty is characterized as the extent to which it is possible to calculate outcome probability distributions. For example, one might consider contexts where there is a clear distribution of outcomes, where there is ambiguity regarding which of many

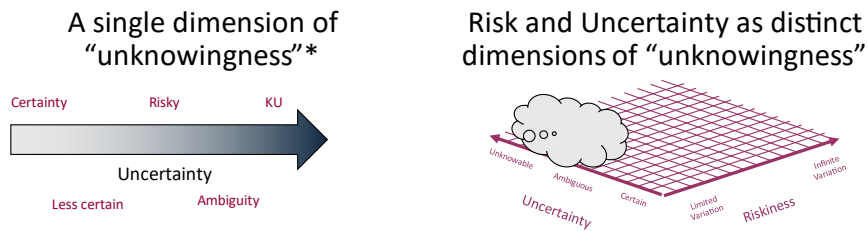
⁶ As explored in Charles Seife’s (2000) book, *Zero: The Biography of a Dangerous Idea*, zero and infinity highlight different decision-making challenges (insufficient or too much data) and play crucial roles in decision-making. As Seife notes, both concepts have met with resistance throughout history and their application requires different rules and techniques.

⁷ It is also possible to consider definitions of riskiness using semi-partial moments (e.g., downside risk or upside potential) returns to a project.

possible distributions will occur, and where there are an infinite number of possible distributions such that outcomes are unknowable.

The central point in Figure 2 is that different combinations of risk and uncertainty are possible. While risk and uncertainty are discussed as continuous concepts, it may also be useful to simplify this representation in terms of discrete levels of risk (high, low) and uncertainty (certain, ambiguous, unknowable). That is, we can describe points of intersection between risk and uncertainty, suggest when the managerial challenges implied by combinations of risk and uncertainty vary in important ways, and define these *interesting* intersecting points as “uncertainty regimes.” Finally, the area of the decision-making space depicted by limited riskiness and infinite uncertainty is ruled out as implausible—it is difficult to conceive of an “unknowable” situation where an infinite number of probability distributions with infinite bounds exist but there is limited dispersion in predicted outcomes. The cloud in the figure serves as a reminder of this implausibility.

Figure 2: Is it more fruitful to consider KU as a discrete point or a continuous concept?



In both images, risk is defined as the degree of dispersion in outcomes and KU is defined the degree to which it is possible to calculate outcome probabilities.

* For example, the four levels of residual uncertainty in Courtney (2001) or discussions by Schoemaker (199x).



A Research Agenda Building on Uncertainty Regimes

Baseline Discussion

The concept of uncertainty regimes provides a means to compare the value of specific approaches and tools across contexts characterized by different levels of risk and Knightian uncertainty.⁸ However, even before these comparative assessments, a baseline question regards the relationships between risk, uncertainty, and performance outcomes. For example, the traditional concept of risk (as volatility) is vital to comprehend how variations in profit expectations should align with the anticipated profit in established theories like the capital asset pricing model (Perold, 2004). Simply put, the greater the risk or variability around the average, the higher the expected profit must be to warrant the investment of resources and effort. Similarly, the concept of Knightian uncertainty provides a rationale for superior performance in entrepreneurial firms (e.g., Alvarez, 2007; Rumelt, 1987; Teece, 2016). However, it is unclear whether empirical measures such as mean expected performance, downside risk, or upside potential differ across these regimes. This suggests a “fact-based” question amenable to empirical testing.

Research Question 1: Does average firm (project) performance vary across uncertainty regimes characterized by combinations of risk and uncertainty?

Aligning Decision-Making Approaches with Uncertainty Regimes

If problems and decision-making approaches vary in their assumptions regarding uncertainty, then we should observe different choices and outcomes associated with the selection and application of specific frameworks in particular contexts. This sort of comparative logic is not novel. For example, Courtney (2001) associates different levels of uncertainty with the

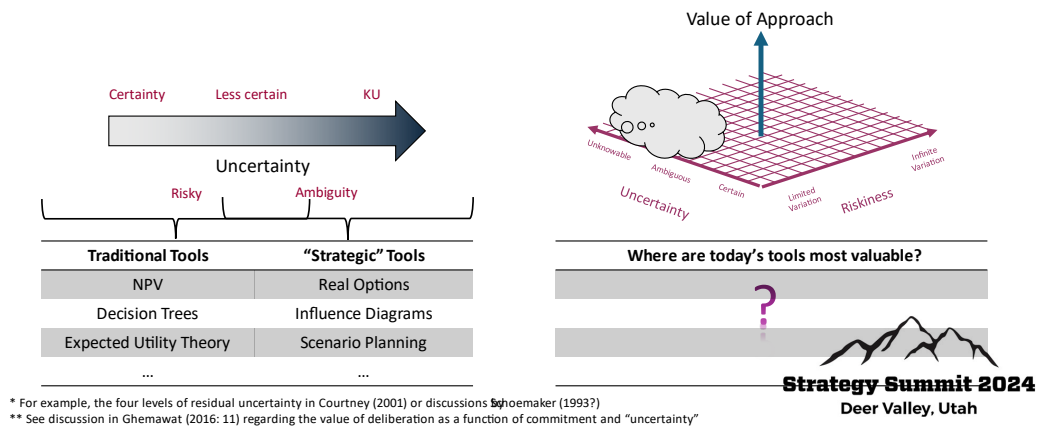
⁸ Of course, the concept of uncertainty regimes could be extended to other forms of unknowingness.

preference for different decision-making approaches. Similarly, Schoemaker (1993?) relates problems where decision-makers are certain of outcomes with traditional decision-making tools such as the NPV approach, decision trees, or expected utility theory. More recently, Ghemawat (2016) argues that the value of dynamic thinking varies with the problem types defined by the degree of irreversibility and uncertainty (riskiness).⁹

The left panel in Figure 3 provides a partial summary of these claims by noting how “traditional tools” such as NPV or decision trees have been linked to more certain and risky contexts and “strategic tools” such as real options or influence diagrams have been linked to more ambiguous or uncertain contexts. The right panel in Figure 3 replicates the “uncertainty regime” consideration of the decision space from Figure 2 above with one addition. The vertical line labeled value of decision-making approach indicates an objective—to depict whether and how the value of “strategic management” or “strategic management approaches” varies over the space. Below the figure is a table suggesting the utility of deriving circumstance-contingent statements and evidence regarding the value of strategic and non-strategic approaches to problems across uncertainty regimes.

⁹ The argument in Ghemawat (2016) applies an “engineering logic” that emphasizes extreme events to make his point. Specifically, when discussing the association between the irreversibility of choices and the value of deliberation, he notes that if choices are ahistorical, management involves a sequence of static optimization choices. By contrast, if choices are completely predestined then the past guides the future, and management can only leverage existing skills. In either instance, there is little room for agency and deliberation to affect outcomes of interest. Similarly, when discussing the association between “unknowingness” of outcomes and the value of deliberation, he notes that if individual managers face zero uncertainty, they are effectively omniscient and make optimal choices. Alternatively, if individuals face infinite uncertainty, they have no basis to predict the outcome of their decisions. The implication/inference is that learning is unnecessary with zero irreversibility and impossible with complete irreversibility. However, at intermediate levels of uncertainty and irreversibility, there are benefits to deliberation and learning

Figure 3: Mapping Decision-Making Approaches to Uncertainty Regimes



There are many prominent styles of thinking and ways of knowing, each rooted in different traditions. For example, one may consider individuals who rely on sensory experience and experimental observation (empiricists), some who emphasize the role of intellectual deduction and reasoning (theorists), and others that truths are known instinctively through non-rational insight (intuitionists). This summit illustrates several approaches to decision-making under uncertainty. For example, recently published work clarifies and extends our understanding of how a firm’s theory of value creation and capture (Felin & Zenger, 2017) or ability to design experiments (Camuffo et al., 2023) affects decision-making under uncertainty. Still, other work discusses how adapting and shaping behaviors (Rindova and Courtney, 2022) or cognitive, theory-based, design-science, and narrative ways of knowing (Rindova, 2024) may foster value creation and capture in worlds characterized by Knightian uncertainty. The paper provided by

Foss (2024) for this panel discusses how pre- and post-decision heuristics can be used to address problems where it is not feasible to resolve KU (non-empirical uncertainty).¹⁰

While there are many valid styles of thinking and ways of knowing, it is less clear whether the usage or effectiveness of these approaches varies across uncertainty regimes. Thus, a basic task illustrated by the right panel in Figure 3, is to determine whether and how the utility of these decision-making approaches varies across uncertainty regimes. This observation suggests the following questions:

Research Question 2a: Does the combination of risk and uncertainty affect the likelihood that managers will select decision-making approaches?

Research Question 2b: Do the outcomes of these specific treatments vary across uncertainty regimes?

Whereas the above work outlines valid claims regarding the benefits of several recognized styles of thinking, it is less clear what is distinctively “strategic” about these approaches. Whereas claims regarding the benefits of theoretical or empirical thinking or about design-science or narrative-based ways of thinking represent important contributions, directly addressing the panel questions requires identifying what is distinctive or unique about strategic thinking as compared to other (valid) ways of thinking.

Although the notion of strategy work remains somewhat esoteric, strategy scholars have developed new ways of thinking about firms and organizations. For example, early strategy work asked questions and claimed to provide a way of thinking that differed from Industrial

¹⁰ The discussion of non-empirical uncertainty in Foss may share some parallels with the notion of contemporaneous uncertainty in Leiblein, Chen, and Posen (e.g., 2017). Leiblein et al (2017) discuss how different decision-making approaches (e.g., biases such as overconfidence; the use of decision supports such as real options theory or feedback learning) may generate competitive heterogeneity and advantage in environments characterized by prospective uncertainty (notions of risk and volatility) or contemporaneous uncertainty (notions of noise or non-empirical uncertainty). This discussion is based on an unreported computational model based on Posen, Leiblein, and Chen (2018).

Organization Economics' focus on social welfare, deviated from the focus of work in Operation Research on inventory and quality optimization, and was distinct from Organization Behavior's focus on job design and motivation. Notable strategy work focuses on leveraging bundles of resources (Barney, 1991) in a coherent manner (Rumelt, 2011), developing interdependent activity systems ((Siggelkow, 2002) and organizational designs (Rivkin and Siggelkow, 2003; Siggelkow and Levinthal, 2003), and investing in a committed (Ghemawat, 1991) or durable (Van den Steen, 2017) fashion.

These approaches, when taken together, suggest that strategy scholars often take a holistic view of the firm. That is, strategic management may be seen as offering a “systems-level” interpretation of firm activity and a clear strategy in the form of responses to fundamental questions, assessment of critical tradeoffs, and recognition of key interdependencies may help navigate uncertainty by committing managers to take consistent and deliberate actions to achieve organizational objectives. This systems-level view offers a way to guide decision-making and influence how managers and employees commit to and achieve their goals (e.g., Ghoshal and Bruck, 2003). That is, a clear systems-level statement of intended direction may be “wrong” due to an inability to predict the future under Knightian uncertainty. However, the clarity of the statement will also help to align choices within the firm in a coherent manner and this coherence of choice, organization, and culture (see Li and Van den Steen, 2021) may affect outcomes.

The above suggests it may be useful to specify some pragmatic ways of identifying “strategic” tools and assessing whether and how they affect decision-making in different uncertainty regimes.

Aligning Strategic Frameworks and Mental Models with Uncertainty Regimes

A vast set of frameworks, mental models, tools, and processes have been applied in the field of strategic management. Ghemawat (2002) outlines eighty-one strategy frameworks introduced between 1958 (Ansoff Matrix) and 2013 (Transient Competitive Advantage). In the introduction to their book, Reeves, Haanaes, and Sinha (2015: 3) build on this list and state, “The number of strategy tools and frameworks that leaders can choose from has grown massively since the birth of business strategy in the early 1960s.”¹¹ Ghemawat (2016: 3) discusses this list of eighty-one frameworks as well as an overlapping list of 32 “new ideas about business and management” provided by Richard Pascale.¹² In his discussion of the complete strategy landscape, Collis (2021) discusses several questions and tools strategists use to help firms deal with a changing environment, value creation, capture, and realization, as well as to maintain desirable outcomes.

While these lists of strategy frameworks are large, they represent one pragmatic way of testing whether “strategic” thinking is useful in worlds categorized by Knightian uncertainty (or other challenging uncertainty regimes). For example, observing that many strategic tools don’t require precise quantitative inputs (e.g., Porter’s 5 forces), we might argue that these tools encourage experimentation. Or, observing that other strategic tools describe contexts that support superior performance (e.g., the RBV or SFM logic), we might argue that they encourage actions likely to bring about a positive state (effectuation).

Research Question 3a: Does the combination of risk and uncertainty affect the likelihood that managers will select “strategic” frameworks (e.g., 5 Forces, RBV) over “traditional” frameworks (e.g., NPV, Decision Trees)

Research Question 3b: Are the outcomes associated with the application of “strategic” frameworks superior or inferior to the outcomes associated with the application of

¹¹ Reeves, Haanaes, and Sinha also reference the list in Ghemawat (2002).

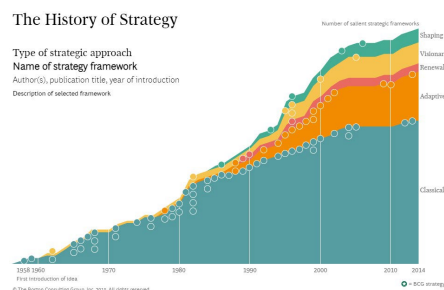
¹² This list of 32 ideas is an extension of a prior list originally published in Pascale (1990).

“traditional” frameworks? Are “strategic” frameworks superior in higher uncertainty regimes?

Existing efforts to categorize prominent strategy frameworks suggest an even finer-grained test. For example, Reeves et al (2015) and Ghemawat (2016) classify frameworks into those that fit definitions of “traditional” or “adaptive” strategy palettes (Reeves et al., 2015) or that offer more “static” or “dynamic” ways of thinking (Ghemawat, 2016). These classifications suggest that some (e.g., dynamic) strategy tools may be more useful than other strategy tools across uncertainty regimes.

Figure 4: Categorizing prominent strategy frameworks

- Are dynamic frameworks more likely to be selected in uncertainty regimes characterized by higher risk/uncertainty?
- Does the selection of dynamic frameworks offer a more significant improvement to outcomes in uncertainty regimes characterized by higher risk/uncertainty?



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Research Question 4a: Does the combination of risk and uncertainty affect the likelihood that managers will select frameworks that emphasize “dynamic” or “adaptive” thinking over others that emphasize “static” or “traditional” thinking?

Research Question 4b: Do the outcomes associated with the application of specific classes of frameworks vary across uncertainty regimes?

Aligning Strategic Theories with Uncertainty Regimes

A second pragmatic way to identify prominent strategic management methodologies is to consider the theories that have proven useful when thinking about fundamental “strategy” issues.

For example, Ghemawat (1991) argues that when the payoffs to investments are unknown or risky, firms will make errors in their choices and heterogeneity may emerge. When the investments require significant up-front commitments, these sources of heterogeneity may persist over time. Williamson (1975) argues that bargaining imperfections that affect the distribution of value created are due to factors such as asset specificity, bounded rationality, and (behavioral) uncertainty (Williamson, 1975). Schoemaker (1990: 1182) extends this conversation by pointing out a series of organizational factors for rent enhancement that include (1) individual rationality and creativity, (2) organizational history, reputation, and culture, (3) environmental complexity and instability, and (4) economic, legal, personal, and social “rules of the game.”

Of course, broader and more inclusive lists of important strategic management theories exist. McGahan (2022: 26) provides a list of theories that includes, “transaction-cost economics, organizational economics, capabilities-based views, the resource-based view, the behavioral theory of the firm, agency theory, evolutionary theory, mental models, value-based strategy, network analysis, eco-systems theory, nonmarket strategy, real options, innovation studies, bounded rationality, congruence theory, path dependency, human capital, stakeholder theory, and corporate social responsibility, among others.” While McGahan (2022) emphasizes the challenges of integrating insights from these and other theories, this list of theories may be used to assess the coherence of assumptions regarding uncertainty associated with specific theories. This line of attack is associated with at least one project by a team of prominent scholars in our field.

One imperfect example of leveraging different conceptions of uncertainty to graft or link distinct research theories is provided in a recent series of papers by John Chen, Michael Leiblein, and Hart Posen. These papers are built on the observation that two theories of sequential decision-making under uncertainty, real options, and behavioral learning, are built on two different conceptions of uncertainty (Leiblein, Chen, & Posen, 2017; Posen, Leiblein, and Chen, 2018; Leiblein, Chen, and Posen, 2022).

While the real options perspective assumes a form of uncertainty about future risk and volatility (prospective uncertainty), the behavioral learning perspective assumes a form of uncertainty that is closer to irreducible noise (contemporaneous uncertainty). Posen, Leiblein, and Chen (2018) and Leiblein, Chen, and Posen (2022) develop decision-making models that allow for both forms of uncertainty. These models illustrate conditions where prospective uncertainty creates both upside potential and downside risk and contemporaneous uncertainty generates harmful decision-making errors.

While these models do not focus on Knightian uncertainty or uncertainty regimes as defined in this essay, they demonstrate how scholars use conceptions of uncertainty to link different theoretical perspectives, refine existing theories, and generate new insights. For example, Leiblein, Chen, and Posen (2017) argue how grafting behavioral learning and real options perspectives to strategic factor market logic provides additional insights. An unreported computation model associated with the 2017 paper demonstrates that combinations of prospective and contemporaneous uncertainty may generate competitive heterogeneity. Moreover, this paper explains how decision-making bias (overconfidence) may yield a competitive advantage in contexts with high contemporaneous and prospective uncertainty levels. That is, while all bias is detrimental to performance, in the presence of upside potential (due to prospective uncertainty), errors of commission are less damaging than errors of omission.

Research Question 4: Does the combination of risk and uncertainty affect the likelihood that managers will select one of the prominent frameworks over others?

Aligning Other Important Strategic Approaches with Uncertainty Regimes

While the above discussion outlines some tentative questions to assess the comparative value of specific strategic decision-making approaches, the discussion is incomplete and under-emphasizes important cognitive approaches. Certainly, even with the ability to categorize observations and calculate probabilities, there are times when decision-makers may tend not to do so due to cognitive constraints. Thus, human decision-making can be likened to a pair of scissors, where one blade represents the task environment and the other the cognitive abilities of

the individual (Simon et al., 1987). Thus, 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 (Foss, Klein, & Murtinu, 2022). When faced with uncertainty, humans often resort to intuitive methods such as educated guesses, vision (Foss & Klein, 2012; Kirzner, 1997; Sarasvathy, 2001), judgment (Foss & Klein, 2012), simple heuristics (Bingham & Eisenhardt, 2011, 2014), sensemaking (Cattani, Sands, Porac, & Greenberg, 2018; Weick, 1995), or creating new categories and mental frameworks (Csaszar, 2018; Levinthal, 2011) to make decisions.

Many other valid strategic approaches to decision-making might be fruitfully compared. For example, it would also seem useful to compare deductive approaches that carefully break down, categorize, and analyze alternatives (e.g., Minto, 1990) with more creative approaches that encourage creating, designing, and imagining alternative futures (e.g.,). Relatedly, one might choose to compare the activation of system 1 or system 2 thinking approaches, treatments that activate the salience of different decision-making frames (e.g., Lovallo and Sibony, 2018), or ways of avoiding certain biases or thinking traps (e.g., anchoring bias or confirmation bias). These alternatives are certainly important but not discussed here due to time constraints.

Discussion

This essay has proposed a framework for understanding how strategic management can be useful in a world characterized by Knightian uncertainty. By introducing the concept of "uncertainty regimes," which combine different levels of risk and uncertainty, we can better explore the contributions of strategic management. The research questions outlined in this essay aim to guide future research in comparing the value of specific strategic and non-strategic approaches across these uncertainty regimes.

The essay highlights three primary points. One, the essay introduces the concept of uncertainty regimes, which combine different levels of risk and Knightian uncertainty to categorize decision-making contexts. Two, the essay argues that the field of strategic management offers a systems-level interpretation of the firm, providing coherence to organizational action and value-enhancing insights that differ from other fields. Three, the essay suggests a research agenda that includes empirical testing of performance outcomes across uncertainty regimes, examining the selection and effectiveness of different decision-making approaches, and aligning strategic frameworks with uncertainty regimes.

The proposed research agenda highlights several areas for future investigation. These include conducting empirical studies to test whether average firm performance varies across different uncertainty regimes; investigating how the combination of risk and uncertainty affects the likelihood of selecting specific decision-making approaches and their outcomes, and examining whether the selection and effectiveness of strategic frameworks and mental models vary across uncertainty regimes.

The hope is that by addressing these questions, scholars can contribute to a deeper understanding of how strategic management can navigate and thrive in environments characterized by high levels of uncertainty and risk. However, there are other benefits associated with this approach as well.

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