

**WHY LOOK BACK WITH TROUBLE AHEAD?
THE IMPACT OF ENVIRONMENTAL FRAMES ON STRATEGIC TRANSITION**

WILLEM SMIT

IMD

Chemin de Bellerive 23
CH-1006 Lausanne, Switzerland

STUART READ

IMD

ABSTRACT

We investigate whether managers shift from predictive decision-making in a stable environment to strategies which do not rely on historical information when the situation becomes uncertain. Our experiment involving 147 experienced corporate managers suggests that they do exactly the opposite of what theory suggests they should do.

INTRODUCTION

Roughly 7 of 10 executives in firms around the world use scenario and contingency planning to explore and prepare for alternative possible futures (Rigby & Bilodeau, 2007; *Bain Management Tools 2007 survey*). Planning strategic response to foreseeable change in the environment is powerful when the situation is relatively predictable. But what if it does not? What if a mature environment shifts such that outcomes are sufficiently unrelated to historical patterns, making prediction irrelevant in usefully informing managerial decision-making?

It is within this unruly but increasingly prevalent context that we place our work. The heart of our effort revolves around the seemingly innocent question of what helps or hinders managerial shift in decision-making strategy when the situation changes from predictable to uncertain. We draw on Knight (1921) to articulate the uncertain condition. We build on Staw, Sandelands, & Dutton's (1981) concept of framing to understand the perhaps biased lens through which a manager sees the environment. And we build on Sarasvathy (2001) to offer an approach to strategic decision-making which does not rely on prediction. Combining these bodies of work, we are led to the expectation that managers should shift strategy with changes in the environment, and more specifically that when presented with uncertainty managers should utilize strategies such as effectuation which do not demand predictive inputs to function. But we are also warned of deep cognitive human biases (Schwenk, 1984), specifically the impact of framing on an individual's objectivity regarding the environment, which constrains their ability to do what normatively should be done. Our aimed contribution is the advancement in the understanding of managerial decision-making (over time) when confronted with environmental uncertainty.

THEORETICAL BACKGROUND

One of the ways managers convert the plethora of incoming information they face every day into a meaningful picture of their own environment is by employing frames. Generally considered one manifestation of bounded rationality (Simon, 1957; Rubinstein 1998) frames

enable managers to process incoming information into more simplified structures in order to inform decision-making. Framing of the environment projects the managers' beliefs about the potential impact of environmental change onto their firm's potential, such as implicitly or explicitly bucketing changes into distinctive categories of what constitutes an opportunity or a threat (Dutton & Jackson, 1987).

While framing aids the manager's sense-making process, it can produce intriguing paradoxical reactions to changes in the environment. The empirical evidence on the effects of threat and opportunity frames is far from conclusive. Threat-framing can lead to a threat-rigidity response (Staw, et al., 1981), whereby decision-makers detrimentally limit strategy alternatives under consideration or become unwilling to change logic and behavior in order to manage the threat (e.g., Chattopadhyay, et al, 2005). But that is not always the case (e.g., Bateman & Zeithaml, 1989). Opportunity framing (Sharma, 2000) suggests that perceiving an event positively can generate quite the opposite reaction, guiding decision-makers to change and even shape new alternatives (e.g., Thomas & McDaniel, 1990; Ginsberg & Venkatraman, 1992, 1995).

Attempting to understand the contradictory findings regarding the threat-rigidity thesis we wonder if they exist because the phenomenon has not been investigated over time. We are led to the questions: Is threat-rigidity an immediate reaction to the threat presented by uncertainty that is overcome with time? Or does threat-rigidity wax and wane as a function of initial frame?

HYPOTHESES

Translating Frank Knight's (1921) articulation of uncertainty into today's managerial environment, we describe uncertainty as the "perceived inability to predict an organization's environment accurately, because of a lack of information or an inability to discriminate between relevant and irrelevant data" (Buchko, 1994, citing Milliken, 1987 and Gifford, Bobbitt & Slocum, 1979). Uncertainty goes beyond the notion of environmental turbulence, where high levels of inter-period change in magnitude and/or direction in the levels or values of key environmental variables and considerable uncertainty and unpredictability as to the future values of these variables (cf. Bourgeois & Eisenhardt, 1988). The critical difference is that in uncertainty the range of possible outcomes is sufficiently broad, and sufficiently unrelated to what has happened in the past that historical information and comparable situations do not relevantly inform strategic decisions. Consistent with this view, we focus on how managers react to an influx of environmental uncertainty. As "uncertainty can only be experienced through decision-making in an organization" (Leblebici & Salancik 1981), we constructed the "What to do Next Simulation" (see methodology section) so we might observe managerial strategic choice in a situation that starts out predictable and presents an influx of market uncertainty over time.

Strategic Transition

Ideally, managers shift strategy with shifting environmental conditions. And work from the strategy literature suggests that one way managers might make sense out of their environment (Daft & Weick 1984), and set strategy, is according to the axes of the predictability or controllability of the environment (Wiltbank et. al. 2006).

Planning and predictive strategy. In a mature environment where history is a reasonably accurate predictor of what may happen in the future, managers can attempt to craft strategy using environmental scanning (Daft, et al. 1988; Elenkov 1997), and improved planning and goal

setting (Ansoff 1979; Porter 1980) in functions from marketing to operations. All these efforts to predict the environment better might enable managers to formulate better strategies by generating alternatives, rationally evaluating important information, and choosing the risk-adjusted most promising path.

Transformation and effectual strategy. But basing a strategy on the predictability becomes ineffective in uncertain markets (Knight 1921). And regardless of whether uncertainty comes from the environment, or is initiated by the manager (Jauch & Kraft 1986), strategies based on attempting to predict an uncertain environment are not likely to be well informed. In uncertainty, where the efficacy of prediction is low, managers need to seek ways to leverage on the controllability of the environment (Wiltbank et al 2006). They might adopt effectual strategies, using means and partnerships to co-create a possible future with committed stakeholders (Sarasvathy 2001). An important distinction between predictive and effectual strategies is whether the market environment should be taken as an exogenous phenomenon, and hence can be usefully predicted, or should be taken as endogenous, and hence controllable (Sarasvathy & Dew, 2005).

In strategy making and deciding “what to do next”, many managers with long-range planning and scenario analysis make the (implicit) assumption that what can be predicted can effectively be managed. Wiltbank, et al. (2006) argue, however, that under uncertainty, the connection between prediction and manageability is lost. Either can offer a manager an approach to achieving good outcomes in an environment, but prediction requires sufficient stability that historical information can reliably project what may happen in the future. In uncertain situations, managers might best “control the future, so they do not need to predict it” (Sarasvathy 2001).

Main Effect: Response to Uncertainty over Time

The influx of market uncertainty into a mature situation should lead to strategic response. And since “organizations survive by 'fitting' their strategies...to the nature of the industry context they face” (Lant et al., 1992; e.g., Burns & Stalker, 1961; Lawrence & Lorsch, 1969) normatively we expect managers will react to increased uncertainty by moving away from predictive strategies and responding with actions *not* based on prediction. Specifically, they ideally should employ the heuristics and logic learned by their expert entrepreneurial peers for dealing with uncertainty in order to transform the environment (Sarasvathy 2001). Formally:

Hypothesis 1a: Managers starting in a mature environment and facing an influx of environmental uncertainty will select more effectual actions over time than their peers that did not face the influx.

Based on the threat rigidity logic, however, we cannot exclude the possibility that managers may actually respond to an influx of uncertainty in completely the opposite manner. The threat-rigidity response to increasing uncertainty over time may consist in managers choosing to reinforce their efforts to utilize historical information from the environment as a basis for decision-making, and persisting in the use of predictive actions instead of choosing novel strategic actions which might attempt to control the environment. We therefore pose the following competing hypothesis:

Hypothesis 1b: Managers starting in a mature environment and facing an influx of environmental uncertainty will select more predictive actions over time than their peers that did not face the influx.

Moderation: Delay and Acceleration Effects of Framing

Regardless of the directionality of the main effect, there may be factors at work which enhance or retard a corporate manager's preferred strategic response (in this case, adoption of a predictive strategy or a control strategy) when faced with uncertainty over time. How corporate managers make sense of incoming information, and how they have initially framed the situation blends together to form their response to it. Specifically, whether they viewed the initial situation as presenting a threat or an opportunity (Dutton & Jackson, 1987), the novel information about new developments may support or disconfirm those initial ideas. And that combination can have a significant impact on the subsequent actions they take.

Threat frame and delay. When managers frame the environment as predictable, incoming information about sudden unexpected changes introducing environmental uncertainty might undermine that initial idea and therefore threaten their initial expectation. When new information is framed as a threat, it creates a complex and ambiguous picture, could result in cognitive overload (Huber & Daft 1987; Staw, Sandelands, & Dutton 1981), and be perceived as a threat to individuals counting on prediction as a strategic tool. In that situation, managers are likely to be susceptible to "threat-rigidity", where they persist in their original strategy, are not open to alternative options and consequently are slow to choose effectual actions. Hence we pose:

Hypothesis 2: Having framed the company-environment situation as predictable and having been presented with uncertainty (the combination creating a threat), corporate managers will experience threat-rigidity, slowing the transition to effectual actions from predictive actions over time in response to environmental uncertainty.

Opportunity frame and acceleration. Alternatively, when managers view a situation as an opportunity to build a future and grow the business, we expect the reverse of the "threat-rigidity" response. Having an initial opportunity frame makes the managers' reaction to pick effectual actions stronger, because the new information confirms their idea that the environment is "changeable" and "influenceable". We therefore pose the following moderating effect:

Hypothesis 3: Having framed the company-environment situation as shapeable and having been presented with uncertainty (the combination creating an opportunity), corporate managers will reverse threat-rigidity, accelerating the transition to effectual actions from predictive actions over time in response to environmental uncertainty.

METHOD

To test these effects, we conducted a controlled experiment using an Internet-based business simulation: the What to Do Next Simulation. As preparation work for an executive development program, 147 subjects were asked to run the simulation. They were tasked with managing the business for 15 rounds (simulated months). Their objective was to optimize company performance by: (1) choosing strategic actions as they saw fit, and (2) setting production targets in order to manage inventory levels. The latter task was primarily designed to engage them. As for the actions, subjects could choose *one* action during each round from a set of 20 different actions presented in random order; 10 were based on prediction, and 10 were based on an effectual approach. After each round, subjects received a market update and were

asked to start the subsequent round. To avoid undesirable end-game effects, the simulation terminated 5 periods earlier after 10 rounds. The experimental design is a 2 (predictable vs uncertain) \times 10 (period) full factorial design. Uncertainty was manipulated by the market updates.

Participants are students of executive education courses at a business school. 147 individuals participated in our experiment, of which age ranged from 25 to 54 years old, with an average of 37. Except for eleven participants, all have experience in large companies (>500 employees); on average 10.1 years. Respectively 30% and 25% worked in SMEs.

To check the uncertainty manipulation, we used an established scale (Archol and Stern 1988; α = .69 (before) and .83 (after)). The pre- and post measures confirmed successful manipulation. To measure the managers' framing of the company-environment situation, subjects were asked to describe intended strategies after reading the introductory information, but before starting the simulation. Two judges independently protocol analyzed the strategies (Ericsson and Simon, 1993), coding on dimensions of threat, operationalized as strategies based on prediction, and opportunity, operationalized as statements about new markets, products, or segments. Inter-judge agreement was .92 and .75 respectively.

RESULTS

The dependent variable is how many times within a 3-period time-window, effectual strategies were chosen over predictive actions. We find that in both predictable and uncertain conditions, the average effectual actions declines. From 1.81 to 1.65 for managers experiencing the predictable environment; while managers receiving an influx of uncertainty go from a mean of 1.61 to 1.32.

To test the hypotheses, we conducted a series of multiple regression analyses adding interaction effects and later time-lagged effects in steps. In the first step of our analysis, we only looked at the main effects and found a threat-rigidity response towards the influx of uncertainty: managers faced with uncertainty are significantly *more* inclined to persist in choosing prediction-oriented actions in uncertainty ($b = -.37$; $p < .05$), than their peers in a predictive environment. Hypothesis 1a is rejected; and hypothesis 1b is supported.

The subsequent steps in the analyses are to tease out the framing and time effects of the threat-rigidity response to uncertainty by adding both framing variables and time-lagged variables. When a manager frames the situation as predictable but is confronted with an increasing amount of uncertainty, that threat frame *does* delay a shift in strategies in the beginning time periods ($b = -.70$; $p < .05$). Later, this effect disappears, but is replaced by an opportunity framing effect of growth opportunity ($b = .77$; $p < .01$). Initially regarding an uncertain situation as a growth opportunity facilitates decision-making shift to effectual strategies. Hypotheses 2 and 3 are accepted.

We controlled for both entrepreneurial and corporate expertise. Only in one time-window, 4 to 6, do corporate novices experiencing an influx of market uncertainty rely on prediction and choose predictive actions significantly ($b = .77$; $p < .05$) more than the comparison group. Managers with more expertise are inclined to use effectual, non-predictive actions.

DISCUSSION AND CONCLUSION

In this study, we investigate how framing impacts managerial response to an influx of environmental uncertainty over time. Prior theoretical work in the strategy and management

literature guides us to expect that managers faced with a mature and stable environment should take advantage of the historical information available from that environment to make predictions upon which they can craft strategies (Ansoff, 1979; Porter, 1980). Alternatively, in an uncertain situation managers should adopt control-oriented strategies such as effectuation (Sarasvathy, 2001) which do not rely on prediction, but offer managers an approach to shape the outcome of that uncertain environment. The normative idea of matching strategy to the environment is not new (ex: Lawrence & Lorsch, 1967), and has been recently integrated and articulated by Wiltbank, Dew, Read, & Sarasvathy (2006). But whether managers actually do what theory suggests when faced with a changing environment has not been examined.

Using our Internet-based business simulation, we present managers with a situation which unfolds from predictable to uncertain over time, so we might contribute to the discussion on the choice of effectual versus predictive strategy in the face of uncertainty. We compare their strategy choices to a control-group which was presented with a situation that remained predictable. Not only do we address the research question of whether managers change strategy when faced with uncertainty, but we also utilize our setting to investigate whether framing accelerates or retards the shift to effectual strategies when the environment becomes uncertain. In so doing, we contribute new insights to the ongoing discussion around threat-rigidity and framing (Dutton & Jackson, 1987, Gilbert 2005), and to the best of our knowledge, it is also the first time that time-lagged effects of environmental framing biases are investigated.

From this study, we highlight two important findings. The first addresses our question whether threat-rigidity is an immediate reaction to the threat presented by uncertainty that is overcome with the passing of time. We find that when faced with uncertainty, corporate managers' immediate response is exactly the opposite as the literature would normatively suggest: they select predictive actions over effectual actions as uncertainty unfolds. This finding corresponds with the logic of threat-rigidity. Faced with threatening uncertainty managers choose to reinforce their efforts to utilize environmental information to make predictions. This finding is also in line with Weick (1995) and Starbuck and Milliken (1988) who argue that "*managers do not need accurate, but plausible and reasonable environment perceptions.*" Our study shows that corporate managers fall into the trap of trying (too hard) to make their environment perceptions more accurate without questioning their core assumptions about the efficacy of it in uncertainty.

The second finding concerns the second research question about the influences of biases associated with initial environmental framing on the adaptation of strategies. We found evidence for a short-term retarding effect. When managers have strong beliefs about environmental predictability, they briefly delay response time in shifting to effectual strategies. Furthermore, we find evidence for an accelerating effect of environmental framing at a later stage. Expecting a growth opportunity seems to partially offset the threat-rigidity reaction to uncertainty. Framing a situation as an opportunity, managers can accelerate their use of an effectual strategy in the face of an uncertain environment.

Consolidating our findings that managers proactively do the opposite of what theory normatively suggests they should when faced with uncertainty, we raise implications which are likely to open new avenues in strategy research. The implication is that while extant work in strategy has been comprehensive with regard to the static problem of matching strategic approach to environment, insufficient attention has been paid to the dynamic problem of managing strategic transition in the face of an environment which is changing over time.

REFERENCES AVAILABLE FROM THE AUTHORS

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