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STORM CLOUDS AND SILVER LININGS: RESPONDING TO DISRUPTIVE INNOVATIONS THROUGH COGNITIVE RESILIENCE

Abstract

Incumbent firms facing disruptive business-model innovations must decide whether to respond through inaction, resistance, adoption or resilience. We focus on resilient responses to simultaneous perceived threat and opportunity by managers of small incumbent firms. Using cognitive framing arguments, we argue that risk experience moderates perceptions of opportunity, whereas perceived urgency moderates situation threat. We test our framework in the real estate brokerage context where small incumbents face considerable challenges from disruptive business-model innovations such as discount brokers. Analysis of data from 126 real estate brokers broadly confirms our framework. We conclude with implications of our research for small business incumbents.

INTRODUCTION

When digital photography was initially developed, it represented an exciting and innovative opportunity for aspiring entrepreneurs. At the same time, digital photography represented a disruptive technology that posed tremendous challenges for the incumbent film icon, Kodak. Digital photography struck at the very heart of the Kodak business model of producing, selling, and processing film – a model that could become redundant through digital substitution. For over a decade, Kodak has struggled to find ways to respond to this significant disruption, with little or no success, succumbing to the realization that new business model adoption is confronted with multiple barriers; none more significant than managers' cognitive barriers to change (Kim & Mauborgne, 2005; Voelpel, Leibold, Teikie, & Von Krogh, 2005).

Recently, the cognitive perspective has been emphasized as an important explanation for entrepreneurial opportunity generation (Baron & Ward, 2004; Mitchell et al., 2007). We turn this research on its head and present a cognitive perspective of managers' responses to disruptive business model innovation. From the manager's point of view, the key question is how to respond to new entrepreneurial business models; whether through inaction (Charitou & Markides, 2003), proactive resistance (Markides, 2006), adoption (Christensen & Raynor, 2003), or resilience (Sutcliffe & Vogus, 2003). Further, we extend the usual focus on the responses of large incumbents, such as hub-and-spoke airlines' difficulty in effectively responding to the low cost carrier model, or traditional steel manufacturers' loss of market dominance to minimills, to consider how managers of small incumbent firms choose to respond to new business models.

The Kodak story is representative of an increasingly common situation of rapidly changing business environments created by the introduction of disruptive business-model innovations (Charitou & Markides, 2003; Christensen & Raynor, 2003; Markides, 2006). The challenge for managers is to find ways to adopt disruptive business-model innovations in order to prosper, and at times survive the pending environmental change, a concept referred to as organizational resilience (Sutcliffe & Vogus, 2003). While large firms have more resources and scope of expertise, this challenge is particularly difficult for small incumbent firms which are more resource constrained, and so less able to absorb environmental shocks (Dewald, Hall, Chrisman, & Kellermanns, 2007; Jarillo, 1989, Klaas, McClendon, & Gainey, 2000). On the other hand, while resource limitations constrain managers of small incumbent firms, they are able to develop organizational resilience more easily than corporate decision-makers as they are less bound by corporate

roles and contexts that reward caution and asset protection (Markides & Geroski, 2004; Corbett & Hmieleski, 2007). In this sense resilience is a theme that links closely to entrepreneurial studies of opportunity identification (Shepherd & DeTienne, 2005) and cognition (Baron, 2006).

Whether small or large, it is difficult for any organization invested in ‘old ways’ to abandon those known ways in favor of unproven new technologies or business-models. Charitou and Markides’ (2003) study of 98 companies that had faced disruptive business-model innovations demonstrated that a firm’s motivation to respond was a key determinant of firm response. However, they fail to explain where the firm’s motivation is drawn from, leaving a gap between individual managers’ cognitive resilience and motivation. Hirschman (1970) argues that firms respond to their customer’s actions, which is at odds with more recent findings by Christensen (1997), who argues that customers and many existing stakeholders, including employees, are embedded in the inertia of reliable but old ways. Either way, the influences, positive or negative, of various stakeholders both internal and external to the firm, are incorporated within managerial cognition.

Drilling further down from organizational resilience to the managerial decision-making unit of analysis, we note that Sutcliffe and Vogus (2003) argue that the resilient manager has a rare ability to simultaneously manage organization change and stability, consistent with Tushman and O’Reilly’s (1996) description of the “ambidextrous manager”. However, despite the importance of resilience in the face of environmental change (cf. Gittel, Cameron, Lim, & Rivas, 2006), specific attributes or indicators of organizational resilience, in particular those associated with a manager’s cognitive

intentions, have not been clearly delineated. Hence, in understanding resilience to environmental shifts, we are faced with two primary questions: which factors determine an incumbent firm's response to disruptive innovations? And, as organizational actions are an outcome of managerial actions, we are specifically interested in determining which factors influence the cognitive intentions of managers of small incumbent firms facing a pending disruption? In this paper, we derive and test a framework that focuses primarily on the second question. Thus, our research expands Charitou and Markides' (2003) approach by addressing individual-level attributes and perceptions that influence managerial cognition and determine managerial motivations (Atkinson, 1957).

We begin with a review of the relevant literature in organizational resilience and related fields. From this review, we develop a framework that describes the specific attributes of cognitive resilience. These attributes are then incorporated into hypotheses, and tested using primary data collected from 126 managers in small incumbents in the real estate brokerage industry. Our results are discussed, and conclusions are provided including suggestions for managers of small incumbent firms and future research in this area.

A COGNITIVE RESILIENCE FRAMEWORK

Organizational resilience is a relatively new field of research (Lengnick-Hall & Beck, 2005). Unfortunately, the boundaries of organizational resilience have been ill-defined and wide ranging, including studies that range from a stubborn maintenance of previous routines in defiance of pending environmental change (Edmondson, 1999), maintenance of positive changes under challenging conditions (Weick, Sutcliffe, &

Obstfeld, 1999), prosperity in the face of targeted industry threats (Gittell et al., 2006), and a capacity to adjust organizational routines to adapt to untoward events (Lengnick-Hall & Beck, 2005; Sutcliffe & Vogus, 2003). These perspectives are consistent with psychological studies of resilience, which focus on the ability of individuals to adapt (Masten & Reed, 2002), and grow (Richardson, 2002) in the face of adversity. Here, we focus on organizational resilience as an organizational capacity to adopt new organizational routines and processes to address the threats and opportunities arising from disruptive business-model innovation.

Organizational resilience is manifested through both cognitive and behavioral resilience. Cognitive resilience is a decision-making intention based on decision-makers' ability to "notice, interpret, analyze, and formulate responses" to pending environmental change (Gittell et al, 2006). Behavioral resilience represents the action of implementing the formulated response or intentions developed through cognitive resilience.

Disruptive business-model innovations represent a specific form of environmental change, described by Markides (2006) as representing a redefinition of product or service attributes in a manner that is generally perceived as inferior to incumbent product or service providers (Charitou & Markides, 2003; Christensen & Raynor, 2003; Kim & Mauborgne, 2005). While disruptive business-models often incorporate disruptive technologies, adopters need not rely on the discovery of new products or services (Markides, 2006). The challenge for incumbents is that in adopting the business model of their new entrepreneurial competitors, they might run the risk of damaging their existing business and undermining their existing business model (Charitou & Markides, 2003). Furthermore, adopters need to recognize an opportunity to capitalize on the innovation,

raising the question of what cognitive factors enable some decision-makers but not others to notice and respond to such changes in their environment (Mitchell et al., 2007). This is particularly challenging when the new business model might be perceived as both a threat and an opportunity to the incumbent.

Recognizing recombinations as a form of innovation is nothing new (cf. Schumpeter, 1934), and adding the dimension of perceived inferiority links to a depth of literature on disruptive technologies, initiated by Christensen and Bower (1996). The study of disruptive technologies has over time evolved into a consideration of potential disruptions in a myriad of fields, including medical procedures (Christensen, Bohmer, & Kenagy, 2000), global competitiveness (Hart & Christensen, 2002), and newspaper advertising (Gilbert, 2001). Christensen and Raynor (2003) provided a comprehensive list of 75 historic disruptions, including business model innovations in airlines (Southwest), customer relationship management (Salesforce.com), fast food (MacDonalds), car manufacturing (Ford, Toyota), retailing (Wal-Mart, Staples, Amazon), stock brokerage (Charles Schwab), computer manufacturing (Dell), and education (University of Phoenix). In each of these situations, available technologies were applied to business model innovations. The Kodak story is an example of how the wide-spread use of a well-known technology, digital photography, provided the entrepreneurial opportunity for the development of a new business model.

Combining the research on organizational resilience with research on disruptive innovations, and more specifically disruptive business-model innovations, we have developed a framework of cognitive resilience (see Figure 1). In complex and highly uncertain environments, managers of small incumbent firms are more likely to use

heuristic-based rather than a systematic rational process to help them navigate change (Mitchell et al., 2007). The decision context is an important source of cognitive schemas aiding the framing of cognitive heuristics (Corbett & Hmieleski, 2007). Managers' intentions are particularly driven by the extent to which a given competitive situation is perceived as a threat or an opportunity for the firm.

Insert Figure 1

Situation threat represents the manager's perception of an exogenous external threat, such as the introduction of a disruptive business-model innovation. Firm opportunity represents the manager's inward assessment of the opportunity presented to the firm if it were to adopt a disruptive business-model innovation.

To describe our framework, we considered the context of real estate brokerage. Disruptive business-model innovations are taking hold in the real estate brokerage industries in many areas (Miceli, Pancak, & Sirmans, 2007; Rowley, 2005). Information sharing of real estate property listings has shifted the value network from information control and organization to service (NAR, 2003), providing ample entrepreneurial opportunities for both new firms and incumbents. There are three basic categories of new business-models in the real estate brokerage industry. The most drastic is complete dis-intermediation of the brokerage industry through for sale by owner models ('FSBO'), which has gained momentum through online advertising. The discount brokerage model offers targeted services for a reduced fee, transferring some of the work to consumers,

including initial homesearch using electronic datasources. Finally, the corporate model bundles additional services, such as utility connections and legal fees.

The FSBO and discount models clearly fit the definition of disruptive business-model innovations, since they involve recombination of existing activities which cumulatively provide a service inferior to the traditional business model, albeit at a reduced fee. While the FSBO and discount models are significantly different value propositions, they both represent threats and opportunities to small incumbents. Since both of these disruptive business-model innovations can spur a similar range of cognitive reactions in managers, we treat them together in this paper.

If the manager perceives little or no threat from the introduction of disruptive business-model innovations, and further anticipates little or no firm opportunity from adopting the disruption, then we expect that no action will be taken (Quadrant 1). As Charitou and Markides (2003) suggest, ignoring the innovation is a legitimate response by incumbent firms, particularly when the new business model targets different customers, offers different value propositions and requires different skills and competences. With respect to the real estate brokerage industry, legally only licensed Realtors can facilitate a sale, unless the sale is facilitated directly by the owner. This exclusion is used by homebuilders to allow for unlicensed employees to act as sales representatives, thereby cutting the brokerage industry out of these transactions. In response, many brokerage firms recognize that they do not have the builder relationships, knowledge of the building process, and ability to follow-through on warranty concerns, so by and large they have ignored this specific opportunity.

In the next section, we use theories of cognitive framing to illustrate the quadrants of our framework in the real estate context, and propose formal hypotheses on managers' responses to disruptive business model innovations in a small incumbent context.

Cognitive Framing, Risk Experience, and Urgency

Responses to Perceived Threat

Two contrasting schools of situation framing permeate the management literature: prospect theory (Kahneman & Tversky, 1979) and issues interpretation (Dutton & Jackson, 1987). In both schools, framing is malleable and subject to individual or organizational perceptions. For instance, an identical organizational situation can be viewed as being negative (i.e. the need to avoid the possible loss of an existing competitive advantage), or positive (i.e. the need to pursue an opportunity in order to gain a new competitive advantage). Paradoxically, each school predicts an opposite outcome from negatively framed situations. Prospect theory predicts a risk-seeking response (the 'certainty effect'), while issues interpretation predicts a risk-adverse response ('threat rigidity'). George, Chattopdhyay, Sitkin, and Barden (2006) argue that both theories apply, proposing that prospect theory responses link to a potential gain or loss of resources, while issues interpretation responses link to a potential gain or loss in control. They do, however, acknowledge and attempt to address the reality that both resources and control often travel together, and in any event it is difficult to distinguish whether resource or control risks are central to the situation.

Prospect theory was developed to challenge expected utility theory (Friedman & Savage, 1948). Empirical tests of prospect theory confirm the 'certainty effect', wherein

negative framing results in risk-seeking behaviors, while positive framing yields risk-adverse behaviors (Casey, 1994; Kühberger, 1998; Mittal & Ross, 1998; Mukherji & Wright, 2002; Puto, 1989; Quails & Puto, 1987; Sanders, 2001; Wang, 2004; Wang, Simons, & Bredart, 2001; Wiseman & Gomez-Mejia, 1998). Cognitive-based framing is at the centre of explaining prospect theory findings, with a recent meta-analysis concluding that framing is a “reliable phenomenon” (Kühberger, 1998: 23). Further, individual cognition is explicitly incorporated into prospect theory as the cognitive-based “manipulation of the reference point is clearly effective in framing” (36).

Like prospect theory, issues interpretation (Dutton & Jackson, 1987) relies on framing losses and gains around a cognitively constructed reference point. While the certainty effect predicts that negative framing will lead to risk-seeking behavior, issues interpretation research indicates the opposite; that a ‘threat rigid’ response to negative framing will lead to risk adverse behavior. We argue that there are two specific differences between prospect theory and issues interpretation that explain this contradiction: the origin of framing, and the defining nature of risk.

In issues interpretation, framing is socially constructed. The perception process is dynamic involving either a central decision maker, a highly trusted individual within the strategic decision-making team, or a consensus among the members of the strategic decision-making team (Dutton & Jackson, 1987: 77). On the other hand, in prospect theory literature and testing, framing is embedded in the wording of the question. Hence, the origins and subsequent development of issues interpretation is distinctively different from prospect theory. In the issues interpretation process, a chain of events *starts* with the decision maker(s) through the categorization (labeling) of strategic issues as either an

opportunities or threats, which “affects the subsequent cognitions and motivations of key decision makers, these, in turn, systematically affect the process and content of organizational actions” (1987: 77). Opportunity labeling implies a positive situation with expected gains and control, while threat labeling implies a negative situation with expected losses and little control. Due to the central influence of the decision maker(s) in labeling strategic issues based on their understanding of developments in the industry, we hypothesize that issues interpretation more appropriately fits decision-making in small incumbents than prospect theory.

The second distinction between prospect theory and issues interpretation responses relates to the definition and use of ‘risk’. Prospect theory is grounded in pure risk, or knowing the available outcomes and the probability of those outcomes occurring, without knowing the actual outcome (Knight, 1921). This is similar to the risk of rolling dice or flipping a coin. On the other hand, issues interpretation, and more specifically the concept of threat rigidity, addresses uncertain or ambiguous environments (McCrimmon & Wright, 1986). In organizational settings, decision-making is mired in uncertainty, and managers are unable to decouple an uncertain future from deterministic calculations of risk probability. Thus, issues interpretation provides a better framework for understanding strategic decision-making wherein managers of small incumbent firms must interpret uncertain or ambiguous changes without knowing the full range of outcomes and probabilities.

Prospect theory and issues interpretation predict opposite responses to negative framing. Issues interpretation relies on cognitive formulation of framing, which is consistent with organizational settings. Further, issues interpretation incorporates

uncertainty within the determination of risk-adverse behaviour, which is consistent with risk-oriented strategic decision-making. Hence, we argue that, all things being equal, negative framing on its own will encourage risk-adverse responses such as proactive resistance (Quadrant 2 in Figure 1) to disruptive business-model innovations (Charitou & Markides, 2003).

An example of proactive resistance in the heavily regulated real estate brokerage industry is lobbying regulators and proactive efforts to amend legislation to protect incumbent business models. Proactive resistance is a sanctioned and encouraged action by the National Association of Realtors (NAR). In a 2005 memorandum to state affiliates, NAR urged its members to pressure for “state laws that are designated to replace competition with regulation”, adding that “Realtors have the right to lobby for legislative and regulatory action – even if the effect of such action would be anti-competitive” (Wall Street Journal, 2005; A8). Several states, including Missouri, Texas, Illinois, Oklahoma, Iowa, Utah, Florida, and Alabama (Wall Street Journal, 2005), have instituted minimum service standards. The minimum standards include requirements to receive and present offers, which are aimed specifically at attacking the discount brokerage models that will provide a limited service, such as listing without presentation or negotiation services, for a relatively small flat fee.

We therefore propose the following hypothesis, which is consistent with Quadrant 2 of our framework (Figure 1):

Hypothesis 1 – A manager of a small incumbent firm’s increased perception of situation threat arising from a disruptive environmental

change will be positively related to their intention to proactively resist a disruptive business-model innovation.

Responses to Opportunity

There is both intuitive and theoretical support for the capability-based perspective that opportunity framing is consistent with a willingness to adopt disruptive business-model innovations (Charitou & Markides, 2003; Christensen & Raynor, 2003; Markides, 2006). Researchers have considered many theories of how managers recognize the value in new opportunities, including financial potential (Schumpeter, 1934; Shepherd & DeTienne, 2005), prior knowledge (Shane, 2000), alertness (Ardichvili, Cardozo, & Ray, 2003) and managerial cognition (Baron, 2006). For our research, the ‘how’ is less important than understanding why or what factors motivate managers to formulate cognitive-based intentions as a first step toward adopting disruptive business models.

Hypothesis 1 is based on the expectation that threat framing will result in proactive resistance to disruptive business models innovations. The contrary view is that resistance is myopic (Levinthal & Warglien, 1999), particularly if the business model innovation is inevitable due to external forces such as new customer demands (Christensen & Raynor, 2003). A manager of a small incumbent firm who expects the inevitable changeover may perceive benefits, including being an early adopter of a disruptive business-model innovation, even though it requires significant resource reconfiguration (Lavie, 2006). Some managers will distinguish between the threat posed by external factors, and the opportunity available through adoption of new innovative ways (Gilbert, 2003; Lavie, 2006). We expect that organizations that have the necessary

skills, resources, or capabilities that are expected to form a source of competitive advantage will select strategic options that facilitate the exploitation of that opportunity (Barney, 1991).

In Figure 1, Quadrant 3 managers primarily perceive an opportunity for the firm, which stimulates an interest in pursuing the disruptive business-model innovation. This combination of high firm opportunity and low situation threat is likely to reside with ‘early adopters’ who sense the benefits of the disruption in advance of others in the industry. In the real estate brokerage industry, there are a few early adopter firms, some of which are new to the industry. However, many of the new ventures are led by entrepreneurial broker-managers who have made the shift from incumbent firms to start new ventures. In Canada, Realty Sellers was among the first discount realtors, headed by a well-established Realtor Stephen Moranis, previously president of the nation’s largest real estate board. As Charitou and Markides (2003) point out, adoption can take at least two forms, depending on whether the firm is “playing two games at once” by spinning out a new venture internally, or embracing the new model completely and scaling it up. Both of these forms of adoption occur when managers perceive more opportunity than threat.

Hence, our second hypothesis, consistent with Quadrant 3 of our framework, is as follows:

Hypothesis 2 – A manager of a small incumbent firm’s increased perception of firm opportunity arising from a disruptive environmental

change will be positively related to their intention to adopt a disruptive business-model innovation.

Cognitive Resilience: Simultaneous Threat and Opportunity

Finally, we introduce the paradox of high situation threat and high firm opportunity (Quadrant 4 in Figure 1). Charitou and Markides (2003) do not provide a specific response for this situation, and we argue that managers solve this paradox through cognitive resilience. In other words, while the high threat would normally cause incumbents to proactively resist disruptive business-model innovations, a high sense of firm opportunity encourages the manager to consider the benefits of adoption. Adoption may occur through acquisition of a disruptive competitor or direct adoption of disruptive business-model practices. The core contribution of our paper is to examine why managers in small incumbents might choose different resilient responses in this high threat and high opportunity situation. We use literature on cognitive framing to show the importance of risk experience and urgency as moderators in managers' intentions to adopt disruptive business models. If both hypothesis 1 and 2 are supported, then a contradiction exists between the threat response (to resist) and the opportunity response (to adopt).

Gilbert and Bower (2002) explored this contradiction in earnest, applying the issues interpretation principles to their study of the newspaper industry facing disruptive business-model innovations. The authors developed a matrix of responses to disruptive changes, anchored by an independent framing of (1) the resource allocation process and (2) the venture management process. Resource allocation process framing occurs in advance of venture management framing (Gilbert, 2003), creating a response paradox

wherein threat framing at the resource allocation process attracts resources, but opportunity framing provides the control, gains, and positive situation for effective response to disruptive shocks. By de-coupling the response matrix into two time periods, Gilbert and Bower argued that it is possible to isolate the decision-making into two independent actions – one associated with threat framing of the resource allocation intentions, and the other based on opportunity framing associated with venture management. In other words, the firm justifies the resource allocation by recognizing the inherent threat posed by the disruption, and then spins off a new venture mandated to pursue the disruption as an opportunity (Christensen, 1997; Christensen & Bower, 1996; Markides, 2006). This two-staged approach would appear to necessitate a complex and unlikely combination of manipulated framing and ideological flip-flopping, and indeed the results are at best mixed (Charitou & Markides, 2003).

We contend that cognitive resilience provides a more reasonable response to the high threat and high opportunity paradox. The threat of disruptions is exogenous to the firm, and hence quite independent of firm framing of opportunity associated with firm resources. In other words, while threat rigidity arguments emphasize the human nature to resist risky change, resilient managers are able to bridge the dominant threat reaction to consider a reasoned evaluation of the opportunity available based on firm capabilities. Hence, through a resilient response, it is possible to resolve the disruptive ‘dilemma’, described by Markides as the conflict between new and existing ways (2006: p. 21). We contend that previous research indicates that critical developmental experiences (Krueger, 2007), such as risk-based experience, and perceptions of urgency will further moderate the intentions of a resilient manager (Vlaar, DeVries, & Willenborg, 2005).

The secondary matrix we incorporated within Figure 1 examines the variety of resilient responses in a high threat and high opportunity context, and focuses on the moderating impact of risk experience and urgency on resilience. If the manager has a negative risk experience and perceives low urgency of the disruption (Quadrant 4a), we expect them to defer a decision, attending to more pressing priorities while keeping an eye out for ways to gain the necessary experience. When managers perceive negative risk experience coupled with a high sense of urgency (remembering that the threat perception is high), they will set a priority to acquire the necessary experience (Quadrant 4b). For example, in the real estate brokerage industry, managers might hire an experienced manager from internet-based business-models. If urgency is low but risk experience is positive, the manager will monitor the situation, keeping a watchful eye toward selecting the most effective time to adopt the disruption (Quadrant 4c).

Our primary interest is in Quadrant 4d, where risk experience is positive and urgency is high, and where we expect that the manager will formulate intentions to adopt the disruption. Sitkin and Pablo (1992) developed a risk propensity model that integrates both individual and situational factors, finding that: (1) risk behaviour is a reflection of risk propensity interacting with risk perception (an individual indicator), (2) risk propensity is derived from three individual factors (risk preference, inertia, and outcome history), and (3) risk perception is determined by five situational factors (problem framing, problem domain familiarity, top management team heterogeneity, social influence, organizational control systems). Risk propensity is driven largely by risk outcome history (Pablo, 1997), or what we term risk experience, supporting the intuitive

prospect that favorable experience in making risky decisions will enhance the small incumbent manager's risk propensity.

Notwithstanding the relative differences in characteristics of risky decisions, Pablo (1997) found that positive experiences realized through previous risky decision-making will reinforce future risk propensity. Although the manager may not have faced a decision as risky or significant as adopting a new business model, positive past experience is expected to increase propensity to take on larger risks, an intuitive and empirically supported notion (Pablo, 1997). Adopting a new business-model might involve the reallocation of critical resources and reconfiguration of capabilities, and can impact the very survival of the business. Managers will draw on their experience when facing unfamiliar risky propositions, and we therefore expect that risk experience will moderate the response of resilient strategic decision-makers facing disruptive business-model innovations.

Hypothesis 3 – The relationship between a manager of a small incumbent firm's increased perception of firm opportunity and intention to adopt a disruptive business model innovation is moderated by positive risk experience, such that positive risk experience increases the likelihood of intention to adopt.

Comparative studies indicate that innovative-induced industry change is idiosyncratic (cf. Cooper & Schendel, 1976). Managers often face gestation periods that are unpredictable, *ex ante*, and beyond the control of the incumbent. This uncertainty is

further intensified with complex change such as a business-model adoption, which requires process evolution, and possibly acquisition, integration, and elimination of certain firm capabilities (Eisenhardt & Martin, 2000; Lavie, 2006). Ainslie and Haslam (1992) argue that managers will put off addressing major decisions in favour of less important initiatives, *until* there is an imminent cost to avoidance. While gestation periods cannot be predicted with any degree of certainty, managers have industry-specific knowledge of technologies and markets and will therefore tend to formulate their own estimates of the urgency with respect to response needs posed by disruptive business-model innovations. Even where an industry is experiencing an ongoing exogenous shock that presents a high situational threat, managers may not perceive this threat as immediately threatening. For instance, alternative energy sources pose a significant, but less than urgent, threat to the energy industry. Wireless technologies pose a significant, but less than urgent threat to cable companies. Hence, we expect that a manager's intentions to adopt disruptive business-model innovations will be moderated by their perception of the urgency associated with the need to respond.

Hypothesis 4 – The relationship between a manager of a small incumbent firm's increased perception of situation threat and intention to adopt a disruptive business-model innovation is moderated by an increased perception of urgency, such that high urgency increases the likelihood of intention to adopt.

RESEARCH METHOD

The most critical criterion in our selection of an appropriate field of study was timing. Charitou and Markides (2003) emphasize the importance of timing, noting that there is a stage in the evolution of disruptive business-model innovations when incumbents recognize that “the new ways of playing the game are in conflict with the established ways” (57). With respect to the real estate brokerage industry, at the time of our data collection in 2005, the National Association of Realtors (NAR) had already issued many reports indicating to its almost 10 million real estate brokerage members that the old ways would not suffice in the future (NAR, 2003). Technological advances had already taken hold and opened the path for new brokerage business models that offer either fewer services for reduced fees, or increased services for fees comparable to current rates. Disruptive business-model innovations had already gained legitimacy as evidenced by NAR statements such as “...in the next three to five years, consolidation of firms and the shift in power from the independent contractor agent to the real estate firm will reinforce each other to alter the landscape of the real estate brokerage industry” (NAR, 2003, p. 48). It was clear to real estate brokers, at the time of our study that the ‘new ways of playing the game’ were surely in conflict with the established ways.

Real estate brokers are usually either independent owners of their firms or franchisees of large real estate firms such as Remax International. Independent owners have the freedom to set their own business model, choosing their own variant of the traditional full service, new reduced fees or enhanced service models. In a franchise relationship there are term limits on franchises and each franchise operation requires, by statute, a broker as manager. Brokers in a franchise relationship may not have much control over the business model of their overall franchise parent, but have the freedom to

sell their current franchise and step out on their own or franchise with another real estate firm. Thus the field of study is both relevant and appropriate as residential real estate brokers, by provincial statute, are the key decision-makers in small incumbent firms, facing imminent environmental changes from disruptive FSBO or discount business models.

A mail-in survey was sent to approximately 1,100 members (exact numbers were not provided by the administrators) of a real estate brokerage regulatory association in the Canadian province of Alberta. The survey was targeted at residential brokers, which represents the largest contingent association membership. Unfortunately, the association did not have a segregated list of residential brokers, and was only able to provide rough estimates of the proportion of members who primarily act as residential real estate brokers, which was estimated at 85% to 90% of the membership list.

To assist in the survey design, two industry representatives and a senior administrator of the association were asked to complete the instrument and comment on any language or structure concerns. Specifically, they were asked to provide their opinion as to whether the questions 'made sense' in the context of the residential real estate brokerage industry. The surveys were then delivered in sealed envelopes to the association, and mailed by the association in order to preserve membership confidentiality. Due to confidentiality concerns of the association, reminders could not be sent, limiting the number of responses, and survey responses were treated as being anonymous, and thus no specific geographical or identifying statistics could be captured, other than those requested on the questionnaire. Responses were received from 140 participants, representing approximately 15% of the population. Questionnaires from 14

respondents were not included in our analysis due to substantially incomplete questionnaires, leaving a sample of 126.

Although the responses were anonymous, some general information was captured to assess the extent of potential non-response bias within the sample. Comparing the data to other research data (AREA, 2004) indicates that non-response bias based on realtor gender or type of brokerage is not a serious threat to our study. The split between urban and rural clientele was 90/10 in our sample versus 91/9 for the AREA study, and respondents in both studies were predominantly male (83% in this study versus 69% in the AREA study). Our sample consisted of independent brokers (70%), franchise operators (28%) and corporate brokers (11%)¹.

Variables

Our empirical analysis involves 9 variables, each measured through self-report questionnaire items. The measures are mostly based on a five-point scale with both anchor and mid-point references. To enhance reliability, most variables combine two or more measured items, with the total combined scores divided by the number of items measured, thereby resulting in a composite score between 1 and 5. In substantially complete questionnaires, occasional missing fields were replaced by mean values, unless noted otherwise. The variables are described in detail below. Cronbach Alpha values were determined to measure the reliability of all multi item variables.

Insert Table 1

¹ The total is more than 100%, due to some respondents answering both franchise and independent (7%), and respondents checking all three (2%).

Dependent variables. We measured two separate dependent variables to assess the extent to which managers intended to resist or adopt discounted fees, and important disruptive business-model innovation in this industry. As Table 1 indicates, respondents were asked how likely they would be to lobby the authorities to protect the industry (resist), and whether they would be likely to include discounted fees in their service offering (adopt). Responses were scored on a 5 point Likert scale. In our study, adoption and resistance were not significantly correlated at the 0.05 level, indicating that these measures are capturing distinct intentions.

Independent variables. We measured firm opportunity by three indicators designed for this study asking questions on the extent to which discount brokerage was a new opportunity for the firm, and the extent to which the public and customers were encouraging the firm to adopt new business models ($\alpha = 0.64$). We measured situation threat using three indicators of the extent to which the discount model is a threat to the brokerage industry and the extent to which alternative models such as FSBO would threaten incumbents' profits ($\alpha = 0.61$).

Moderating variables. We measured urgency with a single open-ended question. The responses to the question on how long, if ever, it will be before commission rates are reduced in order to meet customer demands were coded to reflect the relative urgency of the pending disruption. Imminent adoption would reflect a gestation period that would clearly indicate a time period shorter than the period required by the incumbent to adopt the disruptive business model. The adoption period can vary depending on the capability reconfiguration needs of the incumbent (Lavie, 2006) from a few months to a few years.

Discussions with industry representatives indicated that a comfortable period to adjust a business model would be 2 to 4 years. Hence, we classified responses under 4 years as a relatively 'short' gestation period, and 5+ years a relatively 'long' gestation period.

Missing items were coded at the mid-point of 3 out of 5 in order to position non-respondents between the polar extremes of a perceived imminent adoption and long or non-existent gestation period.

We used measures suggested by Pablo (1997) to measure risk experience. In that study, the reliability of the measures was 0.87, compared to 0.94 found here.

Control variables. Three control variables were included to address rival theories. Age of respondents was measured and regressed against the dependent variable as a test of the theory that younger managers would be less rigid in their cognitive frames, due to a lack of institutionalized belief in the old business model. Gender was included as a control variable to determine if there was any distinction between the risk preferences of male and female small business managers (Langowitz & Minniti, 2007; Bird & Brush, 2002). Finally, firm performance was included to control for the learning from performance feedback effect, where managers in firms performing below the aspiration level are more likely to adopt strategic changes or innovations than those exceeding expectations (Cyert & March, 1963; Greve, 2003). We measured firm performance using three items, with a very high degree of internal consistency (Cronbach alpha = 0.91). The measures are all set in the current period, inquiring as to volume, profit, and profit per transaction measures in relation to expectations. Industry representatives indicated that these three measures reflect brokerage performance.

We also included direct measures of items for use in testing the influence of social desirability (Greenwald & Satow, 1970) and negative affectivity (Watson, Clark, & Tellegen, 1988). Specific tests were undertaken with these variables, and described below. The descriptive statistics and correlations for all variables are indicated in Table 2. All variables were tested, and determined to follow a normal distribution, with the exception of negative affectivity. The impact of a non-normal distribution for this variable is discussed in the next section.

Insert Table 2

Analysis

One of the challenges of empirical studies employing cognitive-based decision-making models is that, by definition, cognition can only be measured by direct inquiry. Unfortunately, the use of self-report measures for both independent and dependent variables introduces concerns with respect to common method bias (Armitage & Conner, 2001). We addressed this concern through two primary techniques: (1) design procedures, and (2) statistical controls (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Various instrument and process design procedures were incorporated into the research design, including guaranteeing anonymity (to address social desirability), use of industry-specific language (to reduce item ambiguity), reversing pole anchors on item indicators (to improve attentiveness), separating predictor and criterion variables within the instrument design (to reduce response bias), and directly measuring both social desirability and negative affectivity. Although an independent source for the dependent

variable would be desirable, self-report is unavoidable, as intentions can only be measured by asking the manager. With respect to statistical analysis, the social desirability and negative affectivity variables are included in the correlation matrix. Bivariate correlation analysis confirmed that there were no unexpected relationships among the variables tested and either social desirability or negative affectivity (Kline, Sulsky, & Rever-Moriyama, 2000).

We used OLS-based multiple regression, using SPSS version 14.0, to test the models. Multiple regression is preferred for statistical modeling where independent variables are expected to have a direct effect on the dependent variable. In addition, hierarchical regression models allowed us to observe incremental effects of adding variables to the model.

Insert Table 3

Table 3 shows the standardized OLS multiple regression results of the control, independent and moderating variables regressed on the alternative strategies of proactive resistance and adoption. Our results show support for all four hypotheses. Situation threat is positively and significantly related with proactive resistance (supporting H1 in model 2), while opportunity is positively and significantly associated with adoption (supporting H2 in model 4). Model 5 shows support for the moderated relationships hypothesized in H3 and H4. Focusing on the external dimension, decision-makers are even more likely to intend to adopt when the disruption is seen as urgent, for a given level of situation threat. Alternatively, based on an internal focus, decision-makers are more likely to intend to

adopt when they have had a positive experience with risky situations in the past, given a particular perception of firm opportunity.

The demographic control variables were non-significant, indicating that the decision-maker's intention to adopt was not related with either resistance or adoption. Interestingly, the firm performance coefficient was positive and significant in the unmoderated models of adoption (models 3 and 4). For small incumbents, the learning from performance feedback effect seems to be outweighed by the availability of slack resources which might encourage experimentation with new business models (Cyert & March, 1963).

IMPLICATIONS AND CONCLUSIONS

Managers of small incumbent firms show cognitive resilience when they form intentions based on their ability to notice, interpret, analyze, and formulate responses to high threat and high opportunity situations. Disruptive business models introduce threats to existing ways, but also opportunities for new sources of competitive advantage (Markides, 2006). Cognitive resilience enables managers to look past the storm clouds of disruptive change to see the opportunities in silver linings.

Incumbent real estate brokers face considerable challenges from the threat of discount service providers (Miceli, Pancak, & Sirmans, 2007). Discount models are taking hold quickly in the US, with entrepreneurial firms such as Iggy's House which offers free listing services, and Buyside which acts only as a buyer agent rebating 70% of any conventional split commission to the buyer, showing impressive growth in listings and revenue (Cook, 2007). The challenge for small incumbents is to know when to

proactively resist or adopt the new discounted business models, given their limited resources, current capabilities, and the danger that adoption might undermine their traditional full service model (Charitou & Markides, 2003).

In our study, we found support for cognitive framing explanations of the likelihood of resistance and adoption. Specifically, we found support for the issues interpretation, or threat rigid, response which predicted increased likelihood of resistance when managers perceive business model innovation as a threat, and increased likelihood of adoption when the innovation is perceived as an opportunity. We also found evidence that urgency moderates situation threat, and that risk experience moderates firm opportunity in predicting intentions to adopt. Thus real estate brokers respond based on whether they predominantly perceive discount models as a threat or a business opportunity.

Our findings suggest that once the moderating effects of risk experience and urgency are included, the main effects of firm opportunity and situation threat on intention to adopt are non-significant. This may indicate that managers separately align their internal and external perceptions. Looking internally, the real estate brokers evaluate their firm's capabilities and hence opportunities through the lens of their own risk experience. Looking externally, they evaluate the threat of discount models through their perception of urgency. In this way, our research indicates that cognitive resilience grows out of simultaneous, rather than a time delayed, two-step, threat-opportunity assessment as in Gilbert and Bower's (2002) response paradox. We suggest that cognitive resilience depends on a simultaneous internal and external evaluation of the situation, and not a staged process.

Our study of the real estate brokerage industry serves as a reminder that not all incumbents are large, established firms. Examples of large incumbents such as Kodak's failure to respond to the digital photography revolution illustrate the importance of cognitive inertia in large established firms, and how managers in corporate contexts are more conditioned to consolidate or exploit existing business models rather than create new markets (Markides & Geroski, 2004; Kim & Mauborgne, 2005). Our findings suggest that managers in small incumbent firms are also likely to proactively resist adoption if they see the new model as a threat. One explanation for this is that smaller incumbents are generally operating closer to the survival level than large firms, and so managers are more likely to refer to the survival level in assessing their risk preferences than in larger firms (March & Shapira, 1992). Entrepreneurship researchers emphasize that cognitive framing may differ between entrepreneurial and corporate settings (Corbett & Hmieleski, 2007). We would encourage further investigation of cognitive framing in an intermediate context, that of small incumbent firms.

Implications for Small Incumbents

Our research holds at least three practical implications for small incumbents. First, standard issues interpretation threat rigidity arguments indicate that small incumbents will demonstrate the 'deer in the headlights' response to disruptive business-model innovations. We found evidence that this leads to proactive resistance by small incumbents in the short term. While the new business model is not a direct competitor providing a comparable service, or aiming at the same market, urgency remains low and small incumbents can defer a decision or monitor the market. However, if the disruptive

business-model becomes well established in the marketplace it can lead to shifting customer expectations. For example, small boutique clothing retailers have relied on customers' desire to try on clothing to proactively resist changes to pricing and distribution of designer clothing introduced by online retailers. Initially the online model was aimed at a more price-conscious market segment, and so deferral or monitoring by incumbents was successful. Over time, shifting customer expectations about wide stock availability, flexible return policies, transparent pricing and even price flexibility through online auctions are increasing the urgency of this online retailing threat. As urgency increases, ultimately small incumbent firms either face the need to adopt (by for example launching their own online store), acquire (by partnering to gain online experience), or accept a reduced market position.

Second, by framing situations as both high threat and high opportunity, resilient managers in small incumbents are able to position their organizations for adoption when the time is right. Even with negative risk experience and low urgency, the decision to defer (Quadrant 4a) is much more resilient than rigid proactive resistance (Quadrant 2). With positive risk experience or high urgency, the strategic repertoire available is wider, leading to more creative responses. An implication for managers of small incumbents is that they should look for ways to gain positive risk experience by, for example, sharing positive learning experiences within their strategic team or business partner networks. They should also try to find ways to keep urgency low. One way to do this is to clearly delineate the small incumbent's offering from the new business model as independent bookstores have done by emphasizing the social experience of their stores contrasted with the remote delivery of online retailers such as Amazon.com.

Third, small incumbents might find reassurance that once risk experience and urgency are taken into account, the availability of resources is not a significant predictor of likelihood of adoption. Thus small incumbents should not fear limited resources as a barrier to adopting new models. Instead, they should focus on gaining positive risk experience and minimizing urgency as outlined above.

Directions for Future Research

We extended Charitou and Markides' (2003) study of responses to disruptive innovation by using cognitive framing to explain the origins of firm motivation. By focusing on small incumbents, we were able to make more direct connections between the cognitive perceptions of individual decision-makers and motivation to respond at the firm level than is realistic in the large incumbent context. Further, we used cognitive framing to predict when small incumbents would exhibit each of the five responses to disruptive innovation. While our research focused on the intention to adopt, we would encourage others to test the other outcomes in our framework. Specifically, we posit that acquisition of capabilities (Quadrant 4b) and monitoring disruptive innovations (Quadrant 4c) are alternative forms of resilience, based on combinations of risk experience and urgency. These outcomes remain to be empirically tested, and would be a valuable extension to our work.

Mitchell et al. (2007), in their introduction to a Special Issue of this journal on Cognition, focused on the central question of entrepreneurial cognition research: "How do entrepreneurs think?" Our research contributes directly to this central question by exploring the influences of situational, organizational and individual factors that combine

to generate cognitive response. We encourage researchers to extend beyond the isolated considerations of individual motivation to develop more comprehensive models that incorporate direct environmental influences on entrepreneurial cognition.

Our findings also contrast with George et al. (2006) who focused on responses to potential gains and losses of resources as opposed to control. Rather than separate resources from control, we incorporated both in our general questions on perceived threat and opportunity, and focused on risk experience and urgency. Integrating our study with George et al.'s raises the question as to whether risk experience and urgency might relate with gains or losses of resources as opposed to control. We expect that risk experience might relate more closely with control, whereas urgency might relate with resources, but did not test these conjectures in this study. Future studies might also juxtapose George et al.'s explanation for adoption and ours, and ask which factors dominate adoption decisions: urgency and risk experience or the different dimensions of gains and losses.

Finally, we would encourage research assessing whether our findings are due to idiosyncrasies in our research context. More specifically, several of our measures were created to address the real estate context, and the reliability of some variables was less than desired. These measures should be further refined in future studies. We selected the real estate brokerage industry because of the imminent threat posed by discount models, and because independent or franchisee brokers are considered the primary managers and strategic decision-makers in small incumbent real estate brokerages. Since our survey, pressures from discount models have intensified as the success of firms such as Iggy's House and Buyside attests. While we expect our findings to be robust across contexts where the potentially disruptive business model does become a success and ones where

the new business model ultimately fails, we would be interested to see this conjecture empirically tested. We would also encourage our cognitive resilience framework to be tested in the large incumbent context, or in small business contexts where there are no franchisees.

Our paper contributes to our understanding of innovation, specifically by identifying effective incumbent strategic responses to disruptive business-model innovations. Our study of intention to adopt business-model innovations in the real estate brokerage industry helps to answer how incumbents can both accept the risk of new ways, and abandon their old ways. We found that managers' cognitive resilience is vital in meeting this crucial challenge.

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FIGURES & TABLES

TABLE 1
Description of Variables

Variable Name	Measured Items	Anchors	α
Dependent Variables			
Resist Change	You will lobby the authorities to ensure that the industry is protected from discounted fees.	Not at all Likely – Very Likely	
Adopt Change	You will adopt a new business model that includes the option of discounted fees.	Not at all Likely – Very Likely	
Independent variables			
Firm Opportunity	The discount brokerage model is a new opportunity for you	Strongly Disagree – Strongly Agree	.64
	The public wants Realtors to limit their role/service offering	Not True At All – Absolutely True	
	Your customers want to play a more direct role in the real estate process		
Situation Threat	The discount brokerage model is a threat to the real estate brokerage industry	Strongly Disagree – Strongly Agree	.61
	In the coming years, FSBO (for sale by owner) will grow to represent a larger share of the market		
	In the next five years, it is likely that profits will shrink		
Moderating Variables			
Urgency	In your opinion, how long, if ever, will it be before commission rates are reduced in order to meet customer demands?	Open-ended	
Experience	Think back to a significant business situation in the past when you took the more risky alternative:		.94
	How pleased were you with the outcome?	Not At All – Totally	
	Overall how would you rate the outcome?	Very Negative – Very Positive	
	How would you classify the result?	Complete Failure – Complete Success	
Control Variables			
Age	Please indicate your age.	Open-ended	
Gender	Please indicate your gender.	Female or Male	
Firm Performance	Your transaction volume in the current year will be.	Well Above Projections –	.91
	Your profit in the current year will be.	Well Below Projections	
	Your profit per transaction in the current year will be.		

TABLE 2
Descriptive Statistics and Pearson Correlation Values

Variable	Mean	s.d.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Resist Change	2.2	1.3										
2. Adopt Change	2.2	1.2	-.08									
3. Age	54.4	8.2	-.11	-.05								
4. Gender	1.8	0.4	.04	-.09	.24**							
5. Firm Performance	7.7	2.6	-.05	.20*	.13	.03						
6. Firm Opportunity	6.9	2.5	-.14	.44**	.04	-.01	.08					
7. Situation Threat	8.7	2.7	.19*	.13	.00	-.10	.43**	-.02				
8. Urgency	2.8	1.4	-.06	.45**	-.04	-.08	.19*	.42**	.27**			
9. Risk Experience	10.8	2.8	-.04	.17	-.04	.08	-.22*	.20*	-.23**	-.03		
10. Social Desirability	2.1	0.7	-.09	.07	-.04	.02	-.04	.14	-.13	.08	.19*	
11. Negative Affectivity	1.3	0.4	.11	.02	-.01	.03	.29**	.01	.44**	.24**	-.05	.10

* p<.05, ** p<.01; N = 126

TABLE 3
Standardized Regression Tests

Dependent Variable	Proactive Resistance		Adoption		
	Model 1	Model 2	Model 3	Model 4	Model 5
Age	-.12	-.12	-.06	-.08	-.07
Gender	.06	.10	-.08	-.05	-.04
Firm Performance	-.03	-.16	.22*	.18*	.17
Situation Threat		.28**			-.11
Firm Opportunity				.42**	.01
Situation Threat X Urgency					.33**
Firm Opportunity X Experience					.37*
Adjusted R ²	-.007	.050	.030	.203	.273

* p<.05, ** p<.01; N = 126

Figure 1

Cognitive Resilience Framework

