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ASPIRATION AND REAL OPTIONS: A BEHAVIORAL THEORY OF STRATEGIC
DECISION MAKING

By

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Recent debates regarding theories of strategic decision making have attempted to limit the application of real options theory to only those decisions where uncertainty is exogenous and time horizons are fixed. Many projects in a corporate setting do not fit this exclusive definition, so real options theory must either be restricted to a particular context or expanded to accommodate these problems. Rather than restrict the theory, this paper tries to expand real options theory to incorporate managerial behavior and thus attempts to resolve the problems with real options theory. To do so, this dissertation incorporates aspiration theory into real options theory to develop a behaviorally based perspective of option identification, development, and execution. For an empirical context, this research used a subfield of the telecommunications industry from 1996 through 2004. The study separated competitors in this market into two subgroups to highlight behavioral differences between groups. To highlight the importance and dynamics of entrepreneurial market entry, this dissertation divided the industry into two

origin-based groups. This study found interesting behaviors based on the histories of the firms considered. Rather than support within group differences, this study found aspirations have a consistent influence on option purchase and market entry. While the effects of aspiration differences appear homogenous across groups, some results suggest that firms imitate within these groups. In addition, the firms position relative to other firms in the industry influences its tendency to purchase options and enter markets.

Aspiration and Real Options: A Behavioral Theory of Strategic Decision Making

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Since March and Simon (1958), organization researchers have sought concise, formal ways to describe decision making while incorporating the behavioral tendencies of the managers involved. The struggle of trying to define the ephemeral decision processes in formal ways has led to many theoretical advances since their book. A key component of these advances rests on describing the importance of uncertainty in the managerial decision making process. Among others, the entrepreneurship literature has extensively focused on uncertainty and its effect on entry and behavior. Entrepreneurship work has often searched for the interactions of personality and uncertainty without notable success (Janney & Dess, 2006). On a larger level, this approach is an attempt to interact individual or organizational level sentiments with the environment, but there has not been a strong theoretical foundation for modeling these processes until recently.

Real options theory explicitly incorporates formal logic in the decision making. The application of real options theory to corporate decision making provides scholars a concise way to devolve decisions into discrete packets. The theory provides a simple conceptual way to divide decisions in steps, each of which is an option or choice which can be ignored, deferred, or executed. Real options theory is based on the financial options described in the finance literature. Therefore, options provide the investor the right but not the obligation to exchange one good for another at a set time for a set rate. Even the most complex transaction can be broken down in a series of tradable financial options (Kogut, 1991). Real options incorporate the risk and uncertainty associated with each decision, a property that is lost in traditional net present value analysis, but one that has encouraged cross-disciplinary research in the economics (Dixit, 1992; Teisberg, 1993), finance (Trigeorgis, 1993) and management (McGrath, 1997) literatures.

However, while the theorizing of real options has grown to incorporate many different corporate strategies such as preempting market competitors (Miller & Folta, 2002) or research

and development (McGrath, Ferrier, & Mendelow, 2004), the theory is still disconnected from the sociology theories of decision-making and search behavior, which suggest imitation and mimetic behavior. There has been no explicit work that looks at the biases of management or other organizational problems in the use of real options both as a conceptual and a theoretical tool. Real options theory is, as yet, underdeveloped.

Most approaches to the theory focus on the economic choices involved in executing or “striking” a real option while generally ignoring the more social and behavioral components of firm-level decision making. As such, the theory cannot be used to model corporate decision making, it can only be used to describe very precisely defined decisions with a defined time period over which to conduct the investment and specified upfront costs, such as acquisitions or research projects. While real options theory has incredible potential, it has not been developed enough to create a theoretical link between the resources which form the basis of firm strategy and the application of those resources to decision making, real options. Until the theory is refined to incorporate a link from real options to a firm’s underlying resources, real options theory will continue to offer little in the way of practical help to managers and lay exposed for theoretical criticism (Adner & Levinthal, 2004).

This proposal creates this link by incorporating aspirations theory, drawn from The Behavioral Theory of the Firm (Cyert & March, 1963), to explain under what circumstances firms develop strategic options from their resource stocks and how environmental uncertainty changes these options. The theory presented here holds that as the firm fails to live up to its aspirations, managers look for more ways to employ the firm’s internal resources. A firm’s relative performance drives its efforts to find and develop strategic options, a behavior known as search. As search increases, the likelihood of a firm discovering a new strategic option

increases. These options then create a pool of potential strategic actions which are the basis for considering strategic alternatives in the decision making process.

Aspirations then further influence the “striking” or execution of strategic options by influencing managerial risk tolerance and performance expectations. These thresholds represent the manager’s preference for one option over another and the manager’s preference for taking any kind of strategic action.

This paper will expand real options theory by incorporating a behavioral theory which offers a link between firm resources and management’s need to grasp for the brass ring of success. Following an examination of real options, the causes of aspiration levels and their influence on real option creation will be examined in greater detail. This model suggests, by incorporating other research, a process governing how firms take options created through search and move them to execution. The model is tested by comparing entrepreneurial and established market entrants in a new industry. While the results suggest no support for differences in how these firms set aspirations, there are some indications that these two groups display differences in other dimensions.

Literature Review

Bowman and Hurry (1993) first conceptualized corporate strategy through an option perspective. In their model, an option “confers preferential access to an opportunity for investment choice (pg 762).” In other words, an option provides to its holder the right and ready access to strategic assets and choices. Options can be held to be exercised at a later date or disregarded. Options, like decisions, can be as mundane to management as the ability to change maintenance schedules or as strategic as entering a completely new market. All decisions within

a firm can be characterized as an option and the firm itself can be characterized as a collection of strategic options of varying value (Bowman & Hurry, 1993).

The first step in modeling strategy using real options theory is identifying how options are created. Until management seeks to find new options, strategic options exist as “shadow options” within the firm. A shadow option is any possible combination of resources within the firm which has not been recognized by management. Importantly, these combinations do not necessarily have a positive expected payoff. Not all options are profitable or even sensible. This horde of possible resource combinations creates a near endless portfolio of possible firm behaviors which are organized through management attention.

As with any theory borrowed from another field, financial economics in this case, the theory must be adapted to apply it to management theory. Although real options explicitly account for the uncertainty and risk implied in any decision, several characteristics of financial option theory do not clearly translate to real options. First, financial options have a fixed date at which the option is no longer valuable, its expiration date. Real options do not have a fixed expiration date, managers must decipher from the external market and internal corporate circumstances when the value of the option is about to expire. Because the expiration date of an option, and thus its value, depends on the perceptions of management, the use of real options as a management tool can lead to escalation of commitment (Adner & Levinthal, 2004) .

The other major problem with apply real options theory is estimating the price of the real option. Although managers use a logic that is consistent with real options by approaching decisions in incremental and discrete steps (McGrath & Nerkar, 2004), managers tend to systematically under-price the real options within their firm. This under-pricing leads managers to assume that any particular real option will cost less than it actually will, payout more than it

actually will, and is less risky than it actually is (Miller & Shapira, 2004). Thus, managers tend to display a self-serving or optimistic bias in option valuation. In short, the problems with applying real options theory to the practice of management rests on the behavioral assumptions of the managers involved. Under-pricing and escalation of commitment are both behavioral characteristics of managers, and both are largely ignored in the real options literature. A more complete theory of real options will incorporate some of these managerial biases, and this paper suggests one mechanism for doing so, aspirations theory.

Real Options

The model proposed in this paper and depicted in Figure 1 suggests that aspirations underlie the outcomes we observe in modeling firm competitive behavior. Aspirations are the sociological level at which the organization seeks to perform. Behavioral changes result from performance fluctuations above or below these levels (Greve, 2003). Performance relative to aspirations changes behavior, thus aspirations are a useful way to incorporate behavioral factors into an option's value. The behaviors we observe in competitive environments all have option characteristics (Bowman & Hurry, 1993). If aspirations underlie real options, changes in aspirations will have differential effects on those option behaviors.

Insert Figure 1 here

Search When an organization is performing equal to its aspiration level, the members of the organization do not feel a great need to expand their competitive position or to expand their technological offerings. Members of these organizations are content with their firm's competitive position, so they do not try to out-compete other organizations by innovating. In addition, these firms do not have a great deal of slack resources which members of the organization can use to explore. In short, the firm is at a competitive stasis point where slack

resources are committed and new resources are not being committed to solve a problem. This will reduce the organization's search and thus reduce the organization's tendency to purchase new options.

Proposition 1 When organizations are performing equal to their aspiration level, they will be less likely to purchase strategic real options.

In contrast, when an organization is performing above its aspiration level, the members of the firm will have greater free time and more slack resources to use to explore new outcomes. Slack resources increase the tendency of firms to explore and create new options. Slack gives individuals an opportunity to explore and create new and unique combinations of resources which may not have been observed without the creative freedom generated by organizational slack. Greve (2003) and Chen (2003) both found that when firms are performing above their aspiration level, the firms will tend to gather more options.

In contrast, when organizations are performing below their aspiration level, their members feel a sense of unease and nervousness to bring performance back to the aspiration level. This nervousness leads to a contrasted search behavior, normally called problemistic search (Cyert & March, 1963). Problemistic search is constrained by the time pressure of competition. Search intensity will increase and search scope will decrease. Greve (2003) found that R&D intensity increases when firms are below their aspiration. As a result of the reduced scope and increased effort, firms will tend to find options which are more related to the options currently identified and purchased by the firm.

Proposition 2 Option purchase will change in a U-shaped pattern around aspiration level such that as performance becomes quite different from aspiration option purchases will increase.

This section has suggested that option purchase behavior follows a U-shaped relationship with aspiration attainment discrepancy. When firms are performing above or below their aspiration level, they will tend to purchase more options. However, the character of those options will change depending on whether performance is above or below its aspiration level. If the firm is above its aspiration point, it will tend to discover options which are unrelated to the firm's current option portfolio because the slack search that comes from performing above aspirations is a wide-ranging and creative process. In contrast, if the firm is performing below its aspiration point, the firm will tend to collect options which are very similar to those already in its portfolio. When performing poorly, it will engage in a restricted and intense search for new alternatives. Those alternatives are often defined in relation to current options and reflect a reduced tendency for creativity in problem solving.

Option Execution In addition to the effort firms exert to develop options, aspirations also underlie the execution of those options. If the firm is performing below its aspiration level, it will be increasingly gain seeking such that the options it owns will be viewed increasingly positive and will tend to be struck more frequently. March and Shapira (1987) observed a tendency for managers to over estimate the value of options. They also find that managers tend to view risk and return completely separate. In situations where performance is below aspirations, managers may view their abilities to manage risk too optimistically and thus over-commit to a strategy which is unlikely to work. Similarly, Prospect Theory (Kahneman & Tversky, 1979) suggests that when managers are faced with the prospect of losing money, they will tend to take the risky projects, which have a higher potential for payoff. In short, when a firm is operating below its aspiration level, the firm's managers will tend to dissociate the risk of projects from its returns, gather more confidence in their ability to control risk, and behave

increasingly risk-seeking. Conversely, if the firm is operating above its aspiration, it will be loss-adverse such that it will be less inclined to take on new projects, even if those projects might be profitable.

Proposition 3 As performance relative to aspiration declines, the likelihood of option execution increases.

METHODS

To test these theories, it is important to find an industry where firms are looking for information from the market and do not have a historical basis for aspiration formation. The model was tested in a portion of the telecommunications industry which was legalized only in 1996. The competitive local exchange industry (CLEC) was opened by congressional action in 1996 and was immediately flooded with diverse entrants, both entrepreneurial and established. The use of this context will help to isolate the historical and comparative effects of aspiration formation. Information in this market is extremely limited; no firm was public until the industry matured. However, this industry does offer the benefit of detailed data concerning market locations through a database used to route network traffic. All market positions must be in this database because the phone network would not work if they were not. Thus, this dissertation used a recent industry, full of competitive behaviors by well-financed firms, where there are no consistent historical or comparative sources for aspiration formation.

Dependent Variables This study has two dependent variables of interest. The first, option purchase, will be operationalized as certification by a state regulatory body. In order to operate within a state, the competitors first had to go through a certification process. Certification by the state has some properties that make it an ideal option. The most important is that the option has a cost. State certification requires submission of filings to state regulatory

commissions and may also require the firm to appear before the commission before its request is accepted. Secondly, the certification itself provides no incremental income to the firm. The firm will not generate revenue from getting a business license in a state and the certification itself is only transferable if the firm is acquired. Third, the certification can be revoked by the state should the firm not use it. Lastly, the certification event itself is public to other competitors and can be easily monitored. The second dependent variable is the actual market entry. This was measured by looking at the physical installation of a telecommunications switch within an MSA.

Independent Variables This study is suggested that purchase and entry are a function of the market positions of other competitors. Competitors are defined within origin groups and across the whole industry. Performance was assessed by measuring the focal firm's distance from the industry average in market count, option count, and potential customers. Other variables were included to control for differences between markets in terms of market attractiveness.

Model The theoretical model for this study then suggests a two-stage game. The propositions were tested using hazard models and Poisson models to model entry and purchase count respectively. Traditionally, this would be handled using a bi-variate probit regression while adjusting for censoring; however, this was not immediately applicable to this industry context because the markets are not neatly nested within the states.

CONCLUSION

Corporate decisions are two staged. Bowman and Hurry (1993) suggest that firms are collections of options, and it is up to the talents of managers to recognize and implement those options. The model this dissertation developed suggests why firms who are performing well tend to explore and create unique combinations of resources, slack resources can breed

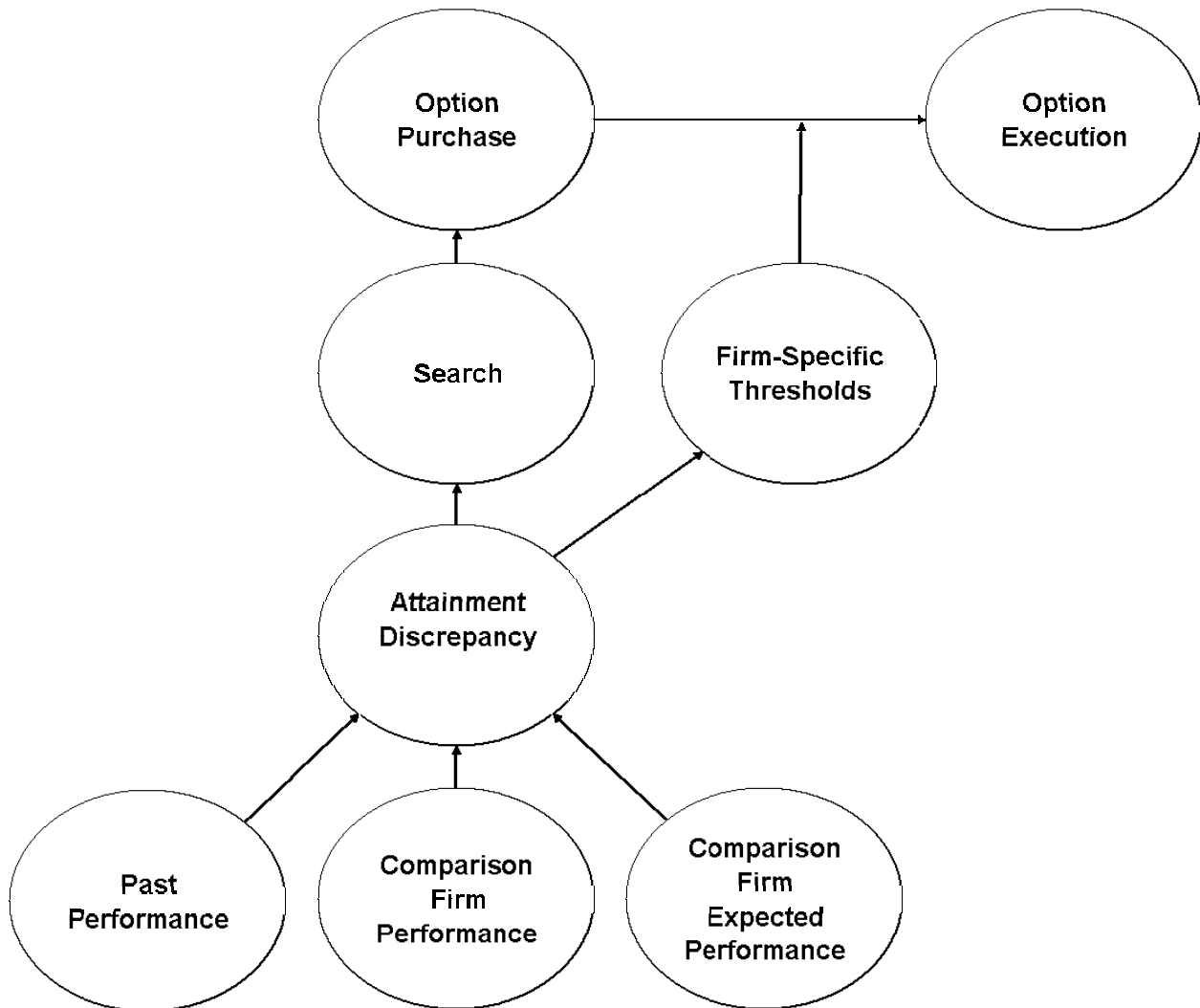
creativity. Similarly, resource constrained organizations do not generate the same option portfolio because their employees are searching for an immediate solution to a pressing problem. By incorporating real options theory with Prospect Theory and the Behavioral Theory of the Firm, this model also suggests why successful firms do not implement the options they have (Greve, 2003) and why poorly-performing firms tend to over-invest in bad projects.

This paper used the behavior of entrepreneurial firms as a laboratory to look for aspiration-based behavior. Entrepreneurial firms did not tend to behave consistently with the theory in this sense. Entrepreneurial and established firms both tended to seek industry dominance and neither seemed to be seeking out a niche strategy. In addition, the entrepreneurial firms showed a higher likelihood of entering markets populated with other entrepreneurial firms while established firms tended to seek out markets which were not currently occupied by competitors. Entrepreneurial firms tended to stick together while the established firms sought to expand the market, a unique finding.

This study had two objectives. The first was to expand the entrepreneurship literature by introducing a theory based on the sociology of corporate decision making. By doing so, future research may be better able to capture the concepts of risk and entrepreneurial behavior by setting them in a larger context. The second objective of this project was to model the market dynamics of entrepreneurial firms. Entrepreneurial firms show some differences in their tendencies than entrepreneurial firms, and they tend to seek out different markets than their established competitors. The findings and the completed objectives form a foundation for strong future research.

Figure 1

Theoretical Model



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