ATTENDING TO OPPORTUNITY: AN ATTENTION-BASED MODEL OF HOW BOARDS OF DIRECTORS IMPACT STRATEGIC ENTREPRENEURSHIP IN ESTABLISHED ENTERPRISES

A Dissertation

by

CHRISTOPHER SCOTT TUGGLE

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2004

Major Subject: Management

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ABSTRACT

Attending to Opportunity: An Attention-Based Model of How Boards of Directors Impact Strategic Entrepreneurship in Established Enterprises.

(December 2004)

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Using the attention-based view, this study is concerned with two levels of board of directors' interaction relating to strategic entrepreneurship: (1) how individual board members may affect the attention of the entire board, and (2) how the board may affect the attention and resource allocation of the firm. Unique to prior literature, this study considers contextual factors at each level of interaction and views the board room communications through unprecedented access. Multiple regression and negative binomial regression analyses are used to test the theoretical hypotheses.

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CHAPTER I

INTRODUCTION

Motivation and Research Questions

Why Should We Study Entrepreneurship in Existing Organizations? Any firm's long-term competitive challenge includes addressing successive shifts in both the dominant technology within its industry and market requirements or preferences for the firm's product. To sustain and prosper from such shifts, a firm needs to seek new competency opportunities while simultaneously leveraging existing competencies. Thus, its decision-makers must continually reinvent the firm entrepreneurially. Considering the "opportunity environment" of the firm, this study investigates the roles that boards of directors, both as individuals and as a whole, play in the process of strategic entrepreneurship.

Prior entrepreneurship researchers have frequently used the terms entrepreneurship and new business ventures synonymously. This lack of distinction between the two terms implicitly suggests that entrepreneurship only occurs in new ventures. Can people in existing organizations not act entrepreneurially? A number of studies have found no support for such distinctions between entrepreneurs and managers or other reference samples (Low & Macmillan, 1988; Stuart & Abetti, 1990).

Hoskisson and Busenitz (2002) note that 80 percent of the research and development (inherently entrepreneurially focused) conducted in developed nations takes place in large firms. However, they also state that large firms account for less than

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This dissertation follows the style and format of the **Academy of Management Journal**.

half of recorded patents. Therefore, while large firms allocate more resources toward entrepreneurial endeavors, they may be inefficient in identifying and/or exploiting entrepreneurial opportunities. Ahuja and Lampert (2001) suggest that larger established firms are producing or certainly contributing to the production of radical or "breakthrough" innovation much more than is recognized. They contend that large firms can, and at least some do, develop routines to foster the production of major innovations that represent significant technological breakthroughs.

The Construct of Strategic Entrepreneurship. Hitt, Ireland, Camp and Sexton (2002) suggest that the concept of *strategic entrepreneurship* details the strategic discipline through which exploration is used to identify entrepreneurial opportunities and exploit them to create firm wealth. Thus, strategic entrepreneurship facilitates firms' efforts to identify the best opportunities (matched to their resources and with the highest potential returns) and to exploit these opportunities with the discipline of a strategic business plan. The goal of strategic entrepreneurship is to continuously create competitive advantages that lead to maximum wealth creation. Strategic entrepreneurship is a critically important business concept for the twenty-first century (Hitt et al., 2002).

Opportunity recognition is prompted from existing stocks of information that influence an individual's framework for interpreting new information. To recognize an opportunity, an individual has to have prior information that is complementary with the new information, which triggers an entrepreneurial conjecture (Kaish & Gilad, 1991). Opportunity recognition is at the heart of all entrepreneurial endeavors, as an opportunity

can only be realized after it has been recognized. So if recognizing entrepreneurial opportunities is so important, a couple of questions intuitively arise: How can a firm actively seek to identify or discover entrepreneurial opportunities? What is important in identifying opportunities? Some scholars have suggested that prior knowledge and/or experience plays a role (e.g. Simon, 1947, Shane, 2000). Others attribute entrepreneurial acumen to specific innate traits of individuals. Many scholars have studied the relationship between existing organizations and entrepreneurial activity, specifically, how organizational (1) structure (Hornsby, Kuratko, & Zahra, 2002; Lumpkin & Dess, 1996a; Naman & Slevin, 1993; Russell & Russell, 1992), (2) rewards (Brazeal, 1993; Hornsby et al., 2002; Kuratko, Hornsby, & Naffziger, 1997), (3) managerial style (strategic or financial system) (Carpenter, Pollock, & Leary, 2003; Chell & Allman, 2003; Messeghem, 2003), etc… relate to entrepreneurial outcomes within the firms. However, prior studies have failed to consider the context in which entrepreneurial strategies and actions are embedded.

Why Should We Study Board Impact on Strategic Entrepreneurship? The allocation of firm resources toward a future potential competency carries considerable risk for top management. They may be concerned that they will be evaluated sooner than the development of the new competency can be realized. *Agency theory* describes the potential for conflicts of interest that arise from the separation of ownership and control in organizations (Berle & Means, 1932; Fama & Jensen, 1983). It suggests that managers may be more likely to choose strategies that leverage existing competencies rather than strategies that pursue future firm competencies. With such top management

risk aversion in mind, this study turns to firms' boards of directors as the decision makers who may directly influence the attention allocation of top managers and indirectly impact strategy resource allocation.

The 1990's presented corporate strategists with a unique problem, too much information. To be valuable, information must be timely, relevant, and accurate. The problem of information overload has prevented these strategists from being able to process available information in a timely manner without the aid of an "information gathering and filtration system". This dissertation suggests that the board of directors is at a distinctive boundary of the firm where management may utilize the board as a key opportunity information gathering and filtration system.

Boards are expected to both protect shareholder value and help create it (Charan, 1998). The *resource dependence theory* views a firm as an open system, dependent on external organizations and environmental contingencies (Pfeffer & Salancik, 1978). Research using resource dependence theory has demonstrated that inter-organizational relationships created through board memberships have a mutually beneficial effect by according firms increased coordination, a reduction in transaction costs, and better access to both information and resources (Zahra & Pearce, 1989). Directors share their expertise and wisdom as a matter of course. Directors' real potential lies in their abilities to help management prevent problems, seize opportunities, and make the firm perform better than it otherwise would. As the management and the board learn together, a collective wisdom emerges and managerial judgment may improve. The board's most general purpose is to continually refocus management's attention on the external

environment. Directors may enrich manager's views of the economic, competitive, technological, political, cultural, and other contexts of the firm. Outside directors, in particular, may offer unique perspectives regarding an organization's external realities. Thus, the right set of directors may be a strategic asset to a corporation.

The relationship between the board and top management is a critical factor in determining the attention of the board and how the board attempts to shape the attention of top management, including the allocation of firm resources. When the board believes they have the right CEO running the organization, the intersecting territory where the corporation's management and the outside directors meet offers many value creating opportunities. The board is, after all, the best opportunity a CEO has to surface blind spots and faulty reasoning. It is also a potential source of creative thinking about new opportunities for growth (Charan, 1998). Although, it is not their mandate to create strategy, boards can help management assess the need, direction, and speed of change. Though boards are sometimes depicted as adversarial toward management or as a mere guardian of management's self-serving opportunism, many CEO's recognize the board as a source of wisdom that asks tough, incisive questions, and offers valuable insights. The ideal situation is an involved board that doesn't micro-manage.

Directors, as representatives of shareholders, may attempt to manage the company's risk portfolio. If management is acting too conservatively, directors can prompt the management to pursue more or different opportunities. They may help top management strike a balance between conflicting dispositions: long-term versus short-term performance, internal versus external demands, and the CEO's personal tendencies.

Directors' years of business experience make them particularly good at sifting through the hard and soft data to discern whether nonperformance in the short-term is due to management's inability to execute or is driven by external change. Quality directors, set in the proper board-management context, should spend most of their time managing risk and looking for growth opportunities (Charan, 1998).

The real value of the board lies in its collective wisdom and perspective. The composition of a board should provide a match with contextual factors in order to most effectively facilitate execution of the board's mandate (Lawrence & Lorsch, 1967; Zahra & Pearce, 1989). Directors' diversity of experiences may add distinctive value when they see things through different lenses than that of management. The best learning comes from the candid exchange of ideas on issues that are critical to the business. Conclusions reflect the thinking of the whole board, not of any one individual. As board members challenge and build on one another's comments, the envelope of thinking and the boundaries of perspective may be expanded. When this occurs, the board is not merely a formality, but rather a vibrant participant in the corporation's value-creation process.

The concept of strategic entrepreneurship lies at a natural intersection of the strategic management and entrepreneurship literatures. However, a significant gap persists in each literature regarding questions of who affects firm-level strategic entrepreneurship and the process by which they affect it. To gain insight on the *who* and *how* of strategic entrepreneurship, the following research questions are suggested:

1. Do boards of directors impel, impede, or exert influence on organizational strategic entrepreneurship?

2. If they (as an entire board) do exert influence, how does the process function and in what context(s) does it occur?

3. Can individual directors influence the attention of the collective board toward strategic entrepreneurship? If so, who are such directors? And, why are they able to shift the collective board's attention?

4. As boards of directors shift their collective attention toward strategic entrepreneurship, is there a change of firm resources toward it as well?

Theoretical Conceptualization

To gain greater understanding of the board's impact on strategic entrepreneurship in existing organizations, this dissertation builds on Ocasio's (1997) conceptualization of the attention-based view, hereafter referred to as "model". Ocasio (1997) applies the attention-based model to the entire organization. Focus here is on how the attention-based model addresses the board of directors' attention allocation and, subsequently, how the board then attempts to direct the attention of the organization.

One of the critical issues in strategy, to which the attention-based model can be applied, is whether and how firms adapt to changing environments. Unlike either models based on rationality or models based on environmental determinism, an attention-based model of the firm provides a unified process-based explanation for the conflicting

findings of both inertia and successful adaptation in organizations. The attention-based model implies that whether and how firms adapt to a changing environment is not a foregone conclusion. Rather, it results from specific contingencies arising from the firm's procedural and communication channels and attention structures (Ocasio, 1997). This is an improvement over the current state of theorizing where different models are applied to explain different outcomes, but no unified conceptual framework incorporates disparate outcomes.

At the individual level, attention includes the noticing and focusing of time and effort on both the environmental stimuli requiring action and the available repertoire of responses which define that action (Ocasio, 1997). The *attention-based model* conceptualizes firms as systems of structurally distributed attention in which the cognition and action of individuals are not predictable from the knowledge of individual characteristics. Rather, they derive from the specific organizational context and situations in which individual decision-makers find themselves. *Attention* encompasses the noticing, encoding, interpreting, and focusing of time and effort by organizational decision-makers on both (a) issues: the available repertoire of categories for making sense of the environment: problems, opportunities, and threats; and (b) answers: the available repertoire of action alternatives: proposals, routines, projects, programs, and procedures (Ocasio, 1997). The attention based model, per Ocasio, emphasizes the distributed nature of organizational decisions, actions, and cognitions.

Conceptual Assumptions. In applying the attention-based model to the board of directors and opportunity identification, the following assumptions and boundary conditions are necessary.

1. The environment is a source of constant input and stimulus for the organization, but individuals and organizations have limited cognitive capabilities to deal with all available stimuli (Simon, 1947; (March & Simon, 1958)).
2. The principle of selective attention is critical (Simon, 1947; (Hoffman & Ocasio, 2001)). This principle suggests that individuals, organizations, and industries will selectively attend to some external events while ignoring others.
3. Some of the hypotheses are at the individual level of analysis. This condition follows from the central assumption of Austrian economics which suggests that different people will discover different opportunities in a given context because they possess different prior knowledge (Kirzner, 1973).
4. Board attention allocation and firm resource allocations are based on the decisions of individuals within the firm, an assumption that is consistent with research on top management teams (Finkelstein & Hambrick, 1996).
5. A "bounded rationality" model of human action and knowledge is adopted. This model permits the conceptualization of the environment and economic opportunity in terms of the information knowledge problem to be solved through effective search and action.

Contributions

This dissertation contributes to the literature in the following ways. First, it gives researchers a glimpse into the boards' attention tendencies and processes regarding value creation. In their introduction to the recent *Academy of Management Review:* special issue on corporate governance, editors Daily, Dalton and Cannella (2003) state that "directors' reticence to invite researchers into the 'black box' of boardroom deliberations is understandable". Directors fear that opening up boardroom activity to external scrutiny may also increase their risk of being subject to a shareholder lawsuit (Daily et al., 2003). Despite this difficulty, I have gained access to approximately 300 companies' board minutes with an average of five sets of minutes per company per year for each of seven years.

Second, the study explores board impact on strategic entrepreneurship within the industrial context of firms. Most prior studies make the assumption that entrepreneurship is inherently a good action regardless of a firm's situational or environmental context. This study is designed to consider contextual factors that may affect the value of strategic entrepreneurial attention by the board or strategic entrepreneurial actions by the firm.

Third, strategic entrepreneurship is a relatively new academic concept and, as such, has been subject to little empirical testing. Through the analysis of board minute text, trade journal text, and financial statements, this study explores the allocation of board attention and firm resources between leveraging existing competencies and pursuing future competencies. Within this contribution, the study investigates which

directors bring potential opportunities to the attention of the board, which directors agree or disagree with certain types of potential opportunities, and the process the directors go through in the evaluation of potential opportunities.

Finally, this study advances the current literature on board of directors from a collection of anecdotes and demographic inferences (such as insider/outsider ratio, age, gender, etc…) to an analysis of what is said, who says it, and how boards affect the allocation of firm resources.

Overview of the Research Method

The theory and hypotheses developed in this study were tested using a sample of approximately 300 publicly traded firms. Building on the industry opportunity differences identified in Klevorick, Levin, Nelson and Winter (1995), three industries were chosen (rubber and plastics – low level of industry opportunity, furniture manufacturing – moderate level of industry opportunity, electronics – high level of industry opportunity) with disparate contexts of opportunity from 1994 through 2000. Klevorick et al. (1995) note that entrepreneurial opportunities have been remarkably different in various industries. Strategic selection of certain industries sets the firms in distinct contexts. The analysis of board minutes reveals the situational strategic decision-making context of the board of directors.

Data were collected from a combination of primary and secondary sources. The complete data set includes (1) information on firm-level strategic entrepreneurial actions, (2) board-level attention allocation - including spatial, temporal and procedural dimensions of director communication, and (3) individual director-level experience and

background characteristics. Firm-level strategic entrepreneurial actions were identified using content analysis of trade journals and reviews of firm financial documents. Board-level attention allocation and the boards communication dimensions were identified through firm board minutes. Individual director experience was obtained from firm proxies and Dunn and Bradstreet. Individual director experience and background characteristics were obtained from secondary sources. Hierarchical data analysis will be used to test the hypotheses generated from the theoretical framework of this study.

Organization of the Dissertation

The remainder of this dissertation is organized as follows. Chapters II and III provide reviews of related literature. They focus on literature in two sub-areas: (a) board of directors' composition, and (b) strategic entrepreneurship, Chapters II and III respectively. These chapters highlight the contributions and limitations of previous research in each of these areas and draw the two diverse literatures toward the concept of the board opportunity identification and evaluation. Chapter IV develops theory and hypotheses concerning the attention of the board regarding strategic entrepreneurship and the firm actions that may or may not result. Chapter V provides a description of the research methods that are used to empirically test the hypotheses generated in Chapter IV. Sample selection, measurement issues, and statistical analysis techniques are discussed. Results of the empirical tests for the hypotheses are provided in Chapter VI. And in Chapter VII, discussions of the results are presented. Concluding this dissertation, Chapter VIII presents conclusions, limitations and implications of this study, as well as future research suggestions.

CHAPTER II

REVIEW OF BOARD COMPOSITION AND DIRECTOR ROLES

Historical Overview of Boards of Directors – Form or Substance?

Boards of Directors' Increasing Relevance. American corporations are required by the Revised View Business Corporation Act (1985) to have a board of directors that is responsible for all the business and affairs of the corporation. If boards are to have any influence on a firm, they must have formal power to act and mechanisms by which they can utilize this power. Pfeffer (1981) defines *power* as the potential ability to influence behavior, to change the course of events, to overcome resistance, and to get people to do things they would not otherwise do. Recently, we have seen the exercise of board power increase, possibly as a result of the corporate reform movement. Boards are exercising their latent power to make or approve critical decisions and to be more active in their governance of the corporation.

Chaganti, Mahajan and Sharma (1985) identify two distinct trends in the corporate reform movement: the changing stockholder role and the growing awareness of board responsibilities. Considering the first trend, the role of stockholders has changed as the composition of stockholders has changed. Institutional investors have become the primary holders of stock, rather than individual stockholders. These material investors are more likely to closely scrutinize company operations and hold the board of directors accountable for corporate actions (Chaganti et al., 1985). For example, the California Public Employees Retirement System (CalPERS) has begun to withhold votes

for incumbent directors of companies with inadequate corporate governance policies and practices (Byrne & Grover, 1997).

Historically, corporate power has been in the hands of the executives with the elected directors playing a relatively passive role, unless the firm's financial condition deteriorated substantially over an extended time. More typically, when investors became dissatisfied with the firm, they had little recourse but to sell their stock. If enough people became dissatisfied with the firm's performance, the firm's stock price became depressed, and the firm may become a takeover candidate (Cadbury, 1999). Therefore, one way that ineffective executives were replaced was through takeovers.

Institutional investors are beginning to react very differently to such situations. They are less likely to move quickly in and out of companies than individual shareholders because of the possible effects on stock price (Pound, 1993). Large stock trades for a firm, either buying or selling, will affect the stock price. Because of the lack of ability to easily buy or sell their positions, institutional investors are not only interested in the financial performance of the firm, but also the strategies of the firm (Pound, 1993). One method for these investors to actively manage their investments is to place a member on the company's board of directors who can represent that investor's financial and strategic interests. This appointment of owner power brings this discussion to the second trend in corporate reform, the evolution of board roles and responsibilities.

Do Directors Matter? As noted above, the second trend in the corporate reform movement involves the evolving role and responsibilities of boards of directors. Early in the board literature, Mace (1971) found, through personal interviews with executives and

directors in large and medium sized companies, that the board's participation in directing the corporation was minimal. Mace (1979) conducted a follow up study ten years later. He found that very little, if any, change had been made in corporate governance. Much of the other early work on boards found that they were more inert than active (Finkelstein & Hambrick, 1996; Mace, 1971; Vance, 1983; Wolfson, 1984). Other studies have suggested that boards are most effective in times of crisis. However, their review of corporate and executive performance tended to be superficial (Clendenin, 1972).

In more recent research, boards of directors, and more specifically, board composition has been broadly explored in relation to: (1) firm value (Hermalin & Weisbach, 1991), (2) perceived/actual agency problems resulting in lawsuits (Kesner & Johnson, 1990), (3) firm R&D expenditures (Baysinger, Kosnik, & Turk, 1991), (4) effect on stock price (Rosenstein & Wyatt, 1997), (5) board effectiveness (Kosnik, 1987), (6) abnormal returns (Lee, Rosenstein, Rangan, & Davidson, 1992), (7) equity-based management compensation (Mehran, 1995), (8) financial statement fraud (Beasley, 1996), (9) acquisitions (Byrd & Hickman, 1992), (10) ownership structure (Shivdasani, 1993), (11) adoption of poison pills (Brickley, Coles, & Terry, 1994), (12) CEO turnover (Weisbach, 1988), (13) CEO selection (Borokhovich, Parrino, & Trapani, 1996), (14) firm leadership structure and bankruptcy (Daily, 1995; Daily & Dalton, 1994a, 1994b), (15) etc... Despite the considerable amount of research concerning board composition and how directors affect firms, this literature has suffered from some important limitations.

A principle limitation of past board research is that most of it has been performed on large, mature, Fortune 500 firms. There is little board research on mid or small cap firms. Some notable exceptions have been when a specific industry is selected for study; such as for profit hospitals (Boeker, 1992; Goodstein & Boeker, 1991; Goodstein, Gautam, & Boeker, 1994; Provan, 1980, 1982), when firms that have filed for bankruptcy are examined (Daily, 1995; Daily & Dalton, 1994a, 1994b, 1995; Gales & Kesner, 1994), or when nonprofit organizations are examined (Bradshaw, Murray, & Wolpin, 1992). Another significant limitation is the conflicting manner in which variables and constructs have been defined and measured across these studies, resulting in conflicting findings.

Theoretical Perspectives of Board Composition

Introduction to Theoretical Perspectives. In the search to discover what separates effective companies from ineffective ones, researchers have sought to identify board characteristics that distinguish the good from the bad. Board composition refers to the experience, family relationships, employment history, and independence (insider-outsider-affiliated) of board members. Several theoretical approaches have been suggested as rationales for boards of directors' roles: agency theory, legalistic perspective, resource dependence theory, class hegemony theory (Zahra & Pearce, 1989). More recently, board roles have been examined through stewardship theory (Sundaramurthy & Lewis, 2003), institutional theory and social network theory (Lynall, Golden, & Hillman, 2003). A majority of this research has centered on two theoretical perspectives: agency theory (Fama & Jensen, 1983) and resource dependence theory

(Pfeffer, 1972; Pfeffer & Salancik, 1978). Agency theory is appropriate for conceptualizing the control/monitoring role of directors. However, additional (and perhaps contrasting) theoretical perspectives are needed to explain directors' resource, service, and strategy roles (Daily et al., 2003; Johnson, Daily, & Ellstrand, 1996; Zahra & Pearce, 1989).

Lynall, Golden and Hillman (2003) suggest that it is not a question of if existing theories, in addition to agency theory, are helpful to understanding boards and firm performance. Rather, the key is when each is helpful. Due to their sparse application, the legalistic, class hegemony, stewardship, institutional and social network perspectives will only be briefly defined here (see Zahra and Pearce (1989) and Lynall et al (2003) for more detailed review of these perspectives). The *legalistic perspective* suggests that boards carry out their legal duty without interference in day-to-day operations (Zahra & Pearce, 1989). The *class hegemony theory* is based on political persuasion and suggests that boards perpetuate the interests of the ruling capitalist elite over other interests (Zahra & Pearce, 1989). *Stewardship theory* contends that enhancing the board-management ties and decision making by empowering managers of the firm will lead to better performance. *Institutional theory* posits that board composition will be determined largely by prevailing institutionalized norms in the organizational field and society (Lynall et al., 2003). *Social network theory* emphasizes the importance of network formation on reputation, trust, reciprocity, and mutual interdependence (Larson, 1992; Lynall et al., 2003).

Each of these four perspectives has driven research to look at the roles that boards play in influencing organizational effectiveness. Yet, as noted above, the prominent perspectives have been agency theory and resource dependence theory. Dalton and Daily (1999) call for research to directly examine the potential disconnect between agency theory and resource dependence theory. Therefore, the perspectives derived from these two theories will be my primary focus.

Agency Theory's View of Board Composition. Most of the recent studies concerning board composition have been developed within an agency perspective. The central hypothesis in these studies is that greater numbers of outside, independent directors are better for public corporations (Rhoades, Rechner, & Sundaramurthy, 2001). Based on agency theory and the empirical evidence derived from it over the past two decades, these researchers have suggested that the board should be comprised entirely of outsiders to ensure strong financial performance. Johnson, Daily and Ellstrand (1996) note that the classification of outside directors, while not invariably consistent, most often relies on indicators of relationships (personal, professional, and/or economic) between the CEO and directors that may affect directors' ability or willingness to disagree or challenge the CEO. When a director has a confounding relationship with the CEO, the director is typically classified as an insider. As one may imagine, this dichotomous classification represents two extremes that may not be accurate depictions of each director. Therefore, many studies have recognized that independence is more accurately depicted by more than one of two categories. Some of these studies classify certain directors, who appear to be less than independent but not completely

interdependent of the CEO, as affiliated directors. Affiliated directors are defined as individuals who have a close relationship with the firm or the CEO and have a required disclosure on the proxy statement of their relationship because of Securities and Exchange Regulation 14A, Item 6(b).

Agency theory essentially holds that the owners of the firm (stockholders) are exposed to the self-serving interests of the managers of the firm. Thus, the role of the directors is to serve as the agent of the owners to protect their interests. Agency theory typically has not considered stakeholders other than stockholders. A review of agency theory may help to understand why other stakeholders are frequently not considered when assessing the appropriateness of board members.

Agency theory is grounded in the assumption that there is a separation of ownership and control in public corporations (Berle & Means, 1932). This separation raises the possibility that the interests of the owners and managers may not be in alignment. The agency relationship has been described as, "a contract under which one or more persons (the principals) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent" (Jensen & Meckling, 1976). The agency literature has developed along two lines, the positivist and the principal-agent literatures (Eisenhardt, 1989b; Jensen, 1983). The positivist literature is most germane to the study of corporate boards, as explained below.

Positivist agency theory focuses on identifying situations in which the principal and agent are likely to have conflicting goals, and then suggesting the governance mechanisms that can control the agent's behavior (Baysinger & Hoskisson, 1990;

Eisenhardt, 1989b; Lorsch & MacIver, 1989; Zahra & Pearce, 1989). Within the board literature, the study by Fama and Jensen (1983) is one of the more notable studies. They described the role of the board of directors as *an information system* that stockholders could use to monitor the opportunism of top executives. The positivist perspective implies that corporate boards should be comprised solely of outside, non-affiliated, independent directors.

According to agency theory, full-time employees of the firm and individuals who have close personal or professional relationships with the CEO or the firm should be minimized when constructing a board (Dalton & Daily, 1999). Boards consisting primarily of insiders or dependent/compromised outside directors are considered to be less effective at monitoring due to their dependence on the organization. Independent boards, or those primarily consisting of independent outside directors, are thought to be the most effective at monitoring because their incentives are not compromised by dependence on the CEO or organization. Agency theory is primarily concerned with creating independent boards or in aligning the interests of directors with those of shareholders to ensure effective monitoring of management. Although the agency role may be an important one that boards fulfill, it may be useful for boards to perform other necessary functions, such as serving as an environmental interface. The resource dependency perspective may be an important way this occurs. After noting the empirical findings surrounding board composition from the agency perspective, I will review the resource dependency's view of board composition and the often conflicting findings that have derived from this parallel topical stream of research.

Agency Theory's Empirical Findings of Board Composition. Dalton, Daily, Ellstrand, & Johnson (1998) note that not one shred of evidence supports the relationship between board composition and corporate performance. Curiously, past studies have found both positive correlations (Pearce & Zahra, 1992) and negative correlations (Beatty & Zajac, 1994) between board independence and firm performance. In their meta-analysis, Dalton et al. (1998) found that these variables were not related, irrespective of the manner board composition is measured and what performance measures are used. This meta-analysis was conducted in an attempt to determine the true relationship between independent directors and firm performance. Dalton et al.'s (1998) conclusion concerning the variables was derived because the studies were grounded within the agency framework. It hypothesizes that firm performance will be related to more outside, independent directors and not related to the skill sets that should be represented on the board, as the resource dependency perspective prescribes.

Other studies that have not looked explicitly at the agency prescriptions found a small positive relationship between board composition and firm performance (Rhoades et al., 2001). Rhoades et al. (2001) stated that their meta-analysis lends credibility to the idea that a supermajority of either inside or outside directors may be appropriate to enhance firm performance.

Resource Dependence Theory's View of Board Composition. Resource dependency theory suggests that firms scan their environment to extract resources that allow the firm to enhance performance and increase its legitimacy in society (Pfeffer, 1972, 1973; Price, 1963; Provan, 1980; Zald, 1967). In their (1999) study, Dalton and

Daily proposed that the resource-dependence role of board members is fundamental to the success of the firm. The theory, based in sociology (Selznick, 1949), assumes the organization is an open system (Katz & Kahn, 1966) and utilizes a contingency approach (Lawrence & Lorsch, 1967). The primary role of boards from a resource dependence perspective, therefore, is to serve as resource providers. This may include providing advice and counsel, legitimacy, channels for communicating information between the firm and external organizations, and assistance in obtaining resources or commitments from important elements outside the firm (Hillman, Cannella, & Paetzold, 2000; Pfeffer & Salancik, 1978).

In contrast to agency theorists, resource dependence theorists contend that boards are vehicles for co-opting important external organizations. An implication of resource dependence theory, then, is that each director may bring different linkages and resources to a board (Lynall et al., 2003). Selznick (1949) found that organizations, when faced with opposition, could neutralize this opposition by placing representatives of the opposing groups on the organization's board. He identified this process as "cooptation". It is one example of how organizations attempt to find a fit between their organization and the environment and cope with environmental uncertainty. *Cooptation* is "the process of absorbing new elements into the leadership policy-determining structure of an organization as a means of averting threats to its stability or existence" (Selznick, 1949). Boards can use cooptation strategies to reduce interorganizational dependencies and environmental uncertainty (Burt, 1979; Pfeffer, 1972). Based on the resource dependency perspective, the underlying patterns of board composition will be

more finely grained than the traditional insider/outsider distinction common in agency theory (Lynall et al., 2003).

Outside Directors from the Resource Dependence Perspective. Pfeffer (1972) further refined the concept of cooptation as a tactic for managing interdependence. He found that board size and composition are systematically related to the organization's need to deal with important external sectors in its environment. One of the ways that organizations can probe their environments is by appointing external representatives to the board of directors (Bazerman & Schoorman, 1983; Burt, 1980, 1983; Galaskiewicz, 1985; Mizruchi & Galaskiewicz, 1993; Pfeffer & Salancik, 1978; Scott, 1991; Zahra & Pearce, 1989).

Pfeffer and Salancik (1978) noted that one of the reasons outsiders are appointed to the board is to provide the organization with managerial and information skills not otherwise available to the organization. This practice may be particularly relevant to smaller organizations that are not able to generate all of their resources internally (Castaldi & Wortman, 1984). In addition to new ideas, external links and strategies, external directors may offer non path-dependent assessments on existing ideas and strategies in the organization. DiMaggio and Powell (1983) suggest that organizational practices can become infused with value beyond the technical requirements at hand and can be adopted for the sake of legitimacy rather than improved performance.

Synthesizing these ideas, independence from the CEO, the most valued effect of director independence from the agency perspective, may be only part of the value derived from director independence. Presumably, an outside director is independent of

the CEO as well as independent of the existing strategies and ideas already engrained within the firm. Therefore, a path-independent perspective on the direction and strategy of the firm offers perhaps more value to an already well governed organization.

Outside directors may provide a critical link to the external environment because of their access to valued resources and information. They may also be able to facilitate interfirm opportunities and initiatives. It is through the board that firms may discover potential environmental opportunities, such as new technological developments and changes in economic conditions.

Overall Empirical Findings of Board Composition. Despite the ubiquity of empirical research dedicated to these board structure issues, the literature provides no consensus regarding the effects of board composition on performance (Daily, Johnson, & Dalton, 1999; Hambrick & Finkelstein, 1995; Zahra & Pearce, 1989). Empirical findings addressing the board's impact on firm performance have been inconclusive (Bhagat & Black, 1999; Daily & Johnson, 1997; Dalton et al., 1998; Kaplan, 1997; Patterson, 2000). See Figure 1 beginning on page 26 for a compilation of contradictory findings surrounding the relationship significance of board composition and firm performance. The lack of empirical support for theoretical views of boards and firm performance calls into question the applicability of existing theories to the phenomena of interest (Lynall et al., 2003). Daily, Johnson, & Dalton (1999) summarize the many operationalizations of director independence that have been made in the boards literature: inside/outside, independent/interdependent, and affiliated. The incredulous

parsing of these definitions, classifications, theoretical basis, and operationalizations may have contributed to the many inconsistencies in the board composition literature.

Board Member Roles

Introduction to Director Roles on the Board. Researchers have presented several roles that boards serve (Johnson et al., 1996; Zahra & Pearce, 1989). Zahra and Pearce (1989) labeled these roles as control, service and strategy. Johnson et al (1996) described two overlapping roles, service and control, and proposed resource dependence as a third role instead of strategy. The roles that board members play have evolved over time. Recognition of these different roles may help researchers better understand director responsibilities beyond the monitoring and control role.

To explore these roles in further detail, I utilize the classification of Dalton and Daily (1999). It consists of three interrelated sets of roles - expertise and counsel, monitoring and control, and resource dependence. This typology of roles is similar in nature, but not identical, with other proposed board role sets (Alexander, Fennel, & Halpern, 1993; Daily & Dalton, 1993; Johnson et al., 1996; Kesner & Johnson, 1990; Mace, 1971; Zahra & Pearce, 1989).

FIGURE 1 Emblematical Studies of Board Composition

Author (Year)	Operationalization Of Board Composition	Dependent Variable(s) Investigated	Findings	
			Sign +/-	Relationship Detail
Positive (Negative) Relationship Between Outside (Inside) Directors and Firm Performance				
Baysinger and Butler (1985)	Independent outsider directors as a proportion of the board	Relative financial performance (RFP) (ROE/industry avg.)	+	Proportion of independent outside directors and: RFP
Hill and Snell (1988)	Insider directors as a proportion of the board	Return on Assets (ROA)	-	Ratio of insiders to outsiders and: ROA
Schellenger, Wood and Tashakori (1989)	Outside directors as a proportion of the board	ROA, ROE, RET and RET/STD RET – shareholder's annualized total market return on investment. RET/STD – Risk-adjusted shareholder's annualized total market return on investment.	+ NR NR +	Proportion of outside directors and: ROA ROE – No significant relationship RET – No significant relationship RET/STD
Daily and Dalton (1992)	Outside directors as a proportion of the board	ROA, ROE and P/E ratio (price earnings)	NR NR +	Proportion of outside directors and: ROA – No significant relationship ROE – No significant relationship P/E ratio
Pearce and Zahra (1992)	Inside/Affiliated/Non Affiliated directors as a proportion of the board	ROA, ROE, EPS and net profit margin	+ + + NR	Proportion of affiliated and non-affiliated directors and: ROA ROE EPS (Non affiliated twice as strong of an effect as affiliated for EPS) Net profit margin – No significant relationship
Daily and Dalton (1993)	Outside directors (not employed by firm) as a proportion of the board	ROA, ROE and P/E ratio	+ + +	Proportion of outside directors and: ROA ROE P/E ratio

FIGURE 1 (cont.)

Author (Year)	Operationalization Of Board Composition	Dependent Variable(s) Investigated	Findings	
			Sign +/-	Relationship Detail
Positive (Negative) Relationship Between Outside (Inside) Directors and Firm Performance				
Hambrick and D'Aveni (1992)	Outside directors (directors who are not officers of the firm) as a proportion of the board	Likelihood of filing a bankruptcy petition	-	Proportion of outside directors and: Likelihood of filing a bankruptcy petition
Daily and Dalton (1994a)	Inside/Affiliated/Outside Affiliated directors as a proportion of the board	Likelihood of filing a bankruptcy petition	-	Proportion of affiliated directors and: Bankruptcy
Daily and Dalton (1994b)	Inside/Interdependent/ Independent directors as a proportion of the board	Likelihood of filing a bankruptcy petition	-	Proportion of independent (outside) directors and: Likelihood of bankruptcy
Daily (1995)	Inside/Affiliated/ Independent directors as a proportion of the board	Bankruptcy reorganization and bankruptcy liquidation	+ -	Proportion of outside directors and: Reorganization Liquidation
Daily (1996)	Outside directors as a proportion of the board	Likelihood of filing a prepackaged bankruptcy	+	Proportion of outside directors and: Likelihood of prepackaged bankruptcy filing

FIGURE 1 (cont.)

Author (Year)	Operationalization Of Board Composition	Dependent Variable(s) Investigated	Findings	
			Sign +/-	Relationship Detail
Positive (Negative) Relationship Between Inside (Outside) Directors and Firm Performance				
Vance (1978)	Inside/Outside directors (Outsiders are external executives or directors serving the interests of special interest groups	ROI, ROE and Changes in *Fortune's* 500 rankings	+ -	Proportion of inside directors and: ROI, ROE and rankings Proportion of outside directors and: ROI, ROE and rankings
Cochran, Wood and Jones (1985)	Insider directors as a proportion of the board. Insiders are measured the following three ways: 1) Current employees 2) Current and past employees 3) Current and past employees and affiliated directors	ROA, ROE, Net profit margin, Firm's assets (Fair Market Value – Book Value) normalized sales	+	Each of the three measurements of insider directors had positive correlations with all four performance measures.
Kesner (1987)	Inside directors as a proportion of the board	ROA, ROE and lagged total returns to investors	+	Proportion of inside directors and: ROA, ROE and subsequent total returns to investors
Agrawal and Knoeber (1996)	Outsider directors as a proportion of the board. Outsiders measured as any nonemployee director	Tobin's Q	-	Proportion of outside directors and Tobin's Q
Yermack (1996)	Inside/Outside/Grey directors each as a proportion of the board	Tobin's Q	NR + NR	Proportion of inside directors and Tobin's Q Proportion of outside directors and Tobin's Q Proportion of grey directors and Tobin's Q
Rosenstein and Wyatt (1997)	Inside directors who are also members of management as a proportion of the board	Cumulative abnormal market returns	+	When management owns 5% - 25% of the company's outstanding stock, the announcement of an inside director appointment results in positive market returns.

FIGURE 1 (cont.)

Author (Year)	Operationalization Of Board Composition	Dependent Variable(s) Investigated	Findings	
			Sign +/-	Relationship Detail
No Relationship between Board Composition and Firm Performance				
Schmidt (1975)	Inside/Outside/Affiliated directors as proportions of the board	Current ratio, working capital/sales dollar, LT debt ratio, and ROE	NR	No significant relationships between board composition and any of the performance measures.
Chaganti, Mahajan and Sharma (1985)	Outside directors as a proportion of the board	Likelihood of filing a bankruptcy petition	NR	No significant relationship between the proportion of outside directors and the likelihood of filing a bankruptcy petition.
Davis (1991)	Insider directors, who are executives of the firms, as a proportion of the board	Market returns (adjusted per industry)	NR	No significant relationship between the proportion of insiders and market returns.
Hermalin and Weisbach (1991)	Outside directors as a proportion of the board (Inside/Grey/Outside)	Tobin's Q	NR	No significant relationship between outside director proportion and Tobin's Q.
Mallette and Fowler (1992)	Independent directors as a proportion of the board	ROE	NR	No significant relationship between independent directors and ROE.
Dalton, Daily, Ellstrand and Johnson (1998)	Meta-Analysis: Various classifications and operationalizations of board composition	Meta-Analysis: Various performance measurements	NR	No significant relationships between board composition and firm performance.
Wagner, Stimpert and Fubara (1998)	Meta-Analysis: Various classifications and operationalizations of board composition	Meta-Analysis: Various performance measurements	NR	Both inside director proportion of a board and outsider proportion of a board were found to be significantly positive.

Expertise and Counsel (Strategy/Service). Lorsch and MacIver (1989) asserted that directors should provide expert advice and counsel to the CEO. Some theorists suggest that a great deal of a director's responsibility is to provide expert advice to the CEO (Alibrandi, 1985; Carpenter, 1988; Mace, 1971; Mintzberg, 1983; Useem, 1993). One critical service that board members perform is the evaluation of shareholder concerns. According to Charan (1998), a good board uses its experience and sophistication to make independent assessments of shareholder concerns. With institutional investors owning and controlling 56 percent of outstanding shares traded on all major exchanges (Edwards, 2000; Hoskisson, Hitt, Johnson, & Grossman, 2002), it is useful to assess which shareholders are true, long-term owners and which shareholders are speculative investors who seek short-term gains.

Daily, Dalton and Cannella (2003) note that directors, whether insiders or outsiders, concern themselves with the effectiveness of their firm's strategy. Directors recognize that the firm's performance directly impacts perceptions of their individual performance. From the firm's perspective, outside directors have been found to increase board participation in strategic decision making with a focus on increasing institutional responsiveness and strategic adaptation (Judge & Zeithaml, 1992). The expertise of the outside directors may allow them to provide valuable insights to the CEO and the firm regarding strategic decisions (Andrews, 1981; Berenbeim, 1996). Judge and Zeithaml's (1992) study was the first direct investigation of actual board behavior. They applied convergent insights of institutional and strategic choice perspectives to explain board

involvement in strategic decision making. They concluded that both perspectives appear to be necessary to describe and explain the board's strategic role.

Monitor and Control (Governance). In performing its monitoring and control role, a board: (1) sets the premises of managerial decision-making, (2) sets limits within which management must act, and (3) attempts to align the interests of senior executives with those of its shareholders (Mizruchi, 1983b). The board serves as the ultimate oversight body. Thus, it needs to have sufficient information, audit, and control systems in place. These systems help to communicate to the board and senior management whether the firm is meeting its business objectives (Conger, Finegold, & Lawler, 1998).

Fama and Jensen (1983) prompted an extensive exploration into the impact of board composition on its ability to effectively monitor top management. This call to research has been heeded, perhaps at the expense of examining and gaining an understanding on the other roles boards play. Most governance theories identify the monitoring and control role as conceptually and normatively important (Bainbridge, 1993; Johnson et al., 1996; Mizruchi, 1983a; Zahra & Pearce, 1989). Legalistic perspectives suggest that the primary purpose of a board is to act in a fiduciary role. This role involves monitoring management for the benefit of the shareholders and the corporation (Bainbridge, 1993; Budnitz, 1990; Cieri, Sullivan, & Lennox, 1994; Johnson et al., 1996; Miller, 1993). Why the overwhelming emphasis on director independence. In brief, the oversight (control) function of the board is often suggested as the most critical of directors' roles (Mizruchi, 1983a; Zahra & Pearce, 1989).

The board of directors' role in corporate control is best exemplified by the selection of the chief executive officer and other senior executives. Corporate law in the United States requires all business of public traded companies be conducted under the direction of a board of directors (Eisenberg, 1976). The board fulfills its monitoring role by ratifying major policy decision, hiring and firing a firm's management team, and determining the compensation of a firm's top managers (Fama & Jensen, 1983). The board has responsibility to make sure the firm has a high caliber CEO and well-informed senior managers (Conger et al., 1998).

The independence of outside directors is a very attractive attribute for many of the roles directors need to fulfill. However, independence is not without weaknesses. Patton and Baker (1987) noted that few directors put much of their own funds at risk. This lack of financial commitment to the firm could mean that the interests of the board of directors are not aligned with those of the many stockholders. Accordingly, this could result in an agency problem (Fama & Jensen, 1983), even though the board members are independent. Monks and Minow (1996) suggested that many outside and independent directors are not qualified to perform their roles properly. The independent directors may lack relevant experience to the firm or the basic skills to perform the roles required of directors.

The control role is where most of the agency-based research has resided. However, this role is too narrow to explain the full functioning of corporate boards. Although independence may be a legitimate concern, other roles fulfilled by the board

should be addressed. A board could be completely independent and still fail in its other roles (Dalton & Daily, 1999).

Resource Dependence (Resource Access). This section briefly reiterates the primary components of this role because they have been reviewed previously in this manuscript. The resource dependence role of board members provides a link to the external environment (Dalton & Daily, 1999). This role fosters access to critical assets, capabilities and information that may not otherwise be available to the firm (Pfeffer & Salancik, 1978). Some of the resources may be represented by independent directors. In addition, affiliated directors can provide these resources as well (Afuah, 2000; Dalton & Daily, 1999). Industry representatives on the board may also be helpful to the firm in finding out about new technological developments within their field (Afuah, 2000). Resource dependency is often an overlooked area of board research (Dalton & Daily, 1999).

Hybrid and Other Roles. As one may imagine, one director can serve more than one of the aforementioned roles for an organization. However, each director may have his or her own portfolio of role competencies that prompted his/her recruitment and subsequent election to the board.

Summary

A review of the board composition and director roles literatures reveals only a few consistencies. One consistency is the increasing importance of boards of directors to the investors they are supposed to serve. There is little consensus, theoretically or empirically, on the extent of board responsibilities or the type of roles that directors

should invoke. Of course, investors are increasingly becoming more knowledgeable and proactive about their investments. Most of these investors are now institutional investors that don't move in and out of investments with ease. Thus, directors, as representatives of the owners, are being held more accountable. Another consistency in these literatures appears to be the importance of context on both board composition and director roles. There appear to be few studies that explicitly portray the unique nature of the board's situational and contextual environments. This study posits that the environment in which a board conducts itself is a critical factor in defining effective board composition and board roles.

CHAPTER III

REVIEW OF STRATEGIC ENTREPRENEURSHIP

Overview of Strategic Entrepreneurship

From the Fragmented Domain of Entrepreneurship Research. The study of entrepreneurship is limited by both the absence of an unambiguous paradigm and the lack of definitional consensus. These limitations can be attributed to the relative newness of entrepreneurship as a field of academic investigation. In the context of Kuhn's (1970) 'the nature of normal science', the entrepreneurship field is in a preparadigmatic state. That is, a variety of paradigms are competing to address the problems of the field. One clear indicator that entrepreneurship is still in a preparadigmatic state is the absence of a definitive core question. For example, strategic management, though it too is in a state of preparadigmatic development, has evolved to generally ask the following core question: 'why does one firm perform better than another?'.

To move beyond core questions centered on the field's definitional inconsistencies, scholars must adopt and explicitly state the definitions of choice for their study. In this vein, one of the more specific definitions as of late, and the one that will be relied on in this dissertation, is presented by Venkataraman (1997). According to Venkataraman (1997), *entrepreneurship* is explaining the discovery, evaluation and development of opportunities. Considering this conceptualization, the field involves the study of: (1) *sources* of opportunities; (2) the *processes* of discovery, evaluation, and

exploitation of opportunities; and (3) implicitly the set of *individuals* who discover, evaluate, and exploit them.

Kirzner (1973; 1979) suggests that the central role of the entrepreneur is to find and exploit opportunities by taking advantage of economic disequilibria. This is achieved by recognizing or knowing things that others do not. Kirzner (1979) notes that entrepreneurs do not have to possess specific knowledge themselves. They may be able to recognize how other people's knowledge, experience, and expertise can be harnessed and employed in a new configuration for profit. Accordingly, the substance of entrepreneurial activity is the recognition of possibility and opportunity. An opportunity results from factors that are both within the control of the entrepreneur (e.g., background, experience) and outside the control of the entrepreneur (contextual and environmental factors). It may be an incremental (Kirznerian) opportunity or a radical (Schumpeterian) opportunity to the market. The principle challenge of entrepreneurial opportunity research is examining when an idea becomes an executable opportunity. An attempt to exploit an entrepreneurial opportunity involves developing a strategy and acquiring and managing the necessary resources to capitalize on the opportunity.

In recent years, scholars have been debating whether the domain of entrepreneurship as the foundation of wealth creation should focus on: (1) newness and novelty in the form of new products, new processes, and new markets as the drivers of wealth creation (Daily, McDougall, Covin, & Dalton, 2002; Lumpkin & Dess, 1996b; Sharma & Chrisman, 1999; Smith & Di Gregorio, 2002) or, (2) alternatively, the discovery and exploitation of profitable opportunities. Despite this divergence, both

perspectives concur that opportunity recognition and creation is at the heart of entrepreneurship (Ireland, Hitt, & Sirmon, 2003; McCline, Bhat, & Baj, 2000).

Defining Strategic Entrepreneurship. As noted, opportunity recognition (discovery), evaluation and commercialization appear to be emerging as a specific focus within entrepreneurship research. Consequently, many scholars have explored opportunities in the context of new ventures. However, capitalizing on opportunities is not the unique domain of new business, but rather business in general. Established businesses must also consider their "strategies" for identifying, evaluating, and commercializing new opportunities.

When referring to established business and entrepreneurship, prior literature has a mixed terminology that naturally straddles the entrepreneurship and the strategic management research domains. The term 'strategic entrepreneurship' derives from the terms that follow. *Strategic actions* are those through which companies develop and exploit current competitive advantages while supporting entrepreneurial initiatives that exploit opportunities to help create competitive advantages for the firm in the future. Through *entrepreneurial actions*, companies identify and then seek to exploit entrepreneurial opportunities that rivals have not noticed or fully exploited (Hitt et al., 2002; Ireland, Hitt, Camp, & Sexton, 2001). Entrepreneurial opportunities are external conditions that suggest the viability of introducing and selling new products, services, raw materials and organizing methods at prices exceeding their production costs (Casson, 1982; Shane & Venkataraman, 2000). Entrepreneurial opportunities exist because of information asymmetries through which different actors develop separate

beliefs regarding the relative value of resources as well as the potential future value of those resources that follow from their transformation of inputs into outputs (Alvarez & Barney, 2002; Kirzner, 1973; Schumpeter, 1934; Shane & Venkataraman, 2000). *Strategic entrepreneurship* is the integration of opportunity-seeking actions with advantage-seeking actions for the purpose of designing and implementing initiatives to create wealth (Hitt, Ireland, Camp, & Sexton, 2001).

Entrepreneurial and strategic actions are complementary, not interchangeable (McGrath & MacMillan, 2000; Meyer & Heppard, 2000). Entrepreneurial action using a strategic perspective is helpful in identifying the most appropriate opportunities for a firm to pursue and in facilitating the exploitation to establish competitive advantages. Entrepreneurs may identify and exploit opportunities that create or establish temporary rather than sustainable competitive advantages. This occurs primarily when entrepreneurs fail to manage resources strategically, making it difficult to sustain the competitive advantages developed (Hitt et al., 2001). Therefore, both opportunity-seeking (i.e., entrepreneurship) and advantage-seeking (i.e., strategic management) behaviors are necessary for wealth creation, yet neither alone is sufficient (Amit & Zott, 2001; Hitt & Ireland, 2000; Ireland et al., 2003; McGrath & MacMillan, 2000).

Some firms are able to identify opportunities, but unable to develop a sustainable competitive advantage. Other firms are able to build competitive advantages but lose their ability to identify valuable entrepreneurial opportunities. Both sets of firms are unlikely to sustain competitive advantages over the long term. As such, they will discontinue creating wealth for their owners. Therefore, all firms, new and established,

small and large, must engage in both opportunity-seeking and advantage-seeking behaviors (Ireland et al., 2003).

Opportunity-Seeking at the Strategic Level. Most business environments have become increasingly competitive, complex and uncertain in recent years. The dynamic environments in which many firms operate contain a wide variety of potential threats and opportunities to firms. There are threats to existing patterns of successful competition as well as opportunities to form competitive advantages through innovations that create new industries and markets. This new landscape is characterized by: (1) substantial and often frame-breaking change; (2) a series of temporary, rather than sustainable competitive advantages for individual firms; (3) the criticality of speed in making and implementing strategic decisions; (4) shortened product life cycles; (5) and new forms of competition among global competitors (Bettis & Hitt, 1995; Hitt, 2000; Hitt et al., 2001, 2002; Hitt, Keats, & Demarie, 1998; Ireland & Hitt, 1999). Hamel (2000) suggests that this new, more competitive landscape's characteristics combine and interact to create an environment in which revolutionaries (entrepreneurial actors) have the potential to: (1) capture existing markets in some instances while creating new ones in others, (2) acquire market share from less aggressive and innovative competitors, and (3) take the customers, assets, and even the employees of staid existing firms (Hitt et al., 2002). Consequently, complacency around a firm's competitive advantage carries a serious risk of having that very competency usurped.

Pursuing Entrepreneurial Opportunities

Scholars have traditionally confined the study of entrepreneurship to the acts of a single individual. In many settings, entrepreneurship is a firm-level phenomenon (Burgelman, 1983, 1984; Covin, 1991; Jennings & Lumpkin, 1989; Kuratko, Montagno, & Hornsby, 1990; Miller, 1983). Kanter (1989), Reich (1987) and Kruglianskas and Thamhain (2000) have all observed that in the corporate environment, entrepreneurship is not accomplished by an individual, but rather in a large organization. Implementation of corporate entrepreneurship strategies is important and can play a major role in the success (or lack thereof) of efforts to produce innovation in firms (Hitt, Nixon, Hoskisson, & Kochhar, 1999).

Corporate entrepreneurship is viewed as important for organizational survival, profitability, growth, and renewal (Zahra, 1996). In prior corporate entrepreneurship research, scholars have explored the mere presence of the 'corporate entrepreneurship' construct and performance, top management teams, inside/outside directors, etc... However, the causal nature of these associations has typically remained unexplained. The perception of opportunity is suggested to propel a firm's decision makers to invest limited resources toward the development of new competencies, invariably at the expense of existing competencies. If opportunities lead to the investments and actions that make up the construct 'corporate entrepreneurship', why are some firms better at identifying opportunities than others?

Finding Opportunities. When studying opportunity recognition, a critical assumption is that opportunities are developed through planning, rather than destined by

happenstance. Whether opportunities are recognized through systematic search or simply by luck has often been debated in the literature. In recent years, some researchers have theorized that people do not search for opportunities. Rather, they happen to recognize the value of new information that they happen to receive. Kirzner (1997) distinguishes 'accidental opportunity discovery' from 'successful systematic search'. He notes that 'accidental opportunity discovery' involves the surprise that accompanies the realization that one had overlooked something that was readily available (Ardichvili, Cardozo, & Ray, 2003). This discovery results from heightened entrepreneurial alertness. Alternatively, the entrepreneur is in a mode sometimes alternatively referred to as 'passive search'. In this mode, the entrepreneur is receptive, though not engaged in a formal, systematic search process. Koller (1988) reported that most entrepreneurs recognized, rather than sought the opportunities for their firms (Ardichvili et al., 2003).

Pluralistic Perspectives of Opportunity. There are different conceptualizations of "opportunity" (Kirzner, 1973; McMullan & Long, 1990; Schumpeter, 1934; Timmons, 1994). A review of prior opportunity-related literature demonstrates the diversity in the conceptualization of an opportunity, including: (1) a "situation" (Stevenson, Roberts, & Grousbeck, 1989), (2) economic "disequilibria" (Kirzner, 1973), (3) an "idea leading to a business concept" (Bhave, 1994), and (4) a new "production function" (Schumpeter, 1934). For the purposes of this research, an *opportunity* is the potential to meet a market need, interest, or want through a creative combination of resources to deliver superior value (Casson, 1982; Kirzner, 1973; Schumpeter, 1934). In its most elemental form, an "opportunity" may appear as an "imprecisely-defined market need, or un- or under-

employed resources or capabilities" (Kirzner, 1979). Underutilized or underemployed resources, as well as new capabilities or technologies, may offer the potential to create and deliver new value for prospective customers. The precise form that this new value will take may be undefined**.**

Numerous views of opportunity recognition and/or development have been presented in recent years (Ardichvili et al., 2003; Bhave, 1994; De Koning & Muzyka, 1999; Singh, 2001). These views are based on different, often conflicting assumptions that are borrowed from a variety of disciplines, ranging form cognitive psychology to Austrian economics.

The view of an entrepreneurial opportunity from an economic perspective suggests that a market imperfection exists or that an economic disequilibrium can be exploited by bringing the market into a state of equilibrium (Kirzner, 1973; 1979). Kirzner (1973) contends that opportunities exist due to the "ignorance of the original market participants". Entrepreneurs are those rare individuals who take advantage of these market inefficiencies by knowing or recognizing things that others do not. His view posits that opportunities exist all around us in time and space. It is only those individuals with "alertness" who have the ability to recognize them.

Kirzner's formulation has been criticized, however, for a lack of attention to uncertainty. According to this criticism, mere alertness to a profit opportunity is not sufficient for earning profits. To reap financial gain, the entrepreneur must invest resources to realize the discovered profit opportunity (Klein, 1999). In Kirzner's formulation, the worst that can happen to an entrepreneur is the failure to discover an

existing profit opportunity. He further suggests that entrepreneurs can earn losses when they misread market conditions. In brief, Kirzner views the entrepreneur as a market actor who capitalizes on the existence of disequilibrium in a market.

In contrast, Schumpeter (1934) views the role of the entrepreneur as a radical market innovator. He describes the vital societal contribution of the entrepreneur as being the instigator of "creative destruction" through innovation. Schumpeter (1934) contends that industries within economies are replaced by other industries over time. Tushman and Anderson (1986) illustrate the Schumpeterian view of creative destruction through research findings which suggest that long periods of incremental changes to markets are broken by technological (radical) discontinuities.

Consistent with Schumpeter, Drucker (1985) stresses the importance of innovation to opportunity. He suggests that innovation is "the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or different service". Drucker's conception of entrepreneurial opportunity is, therefore, consistent with Schumpeter's, as it changes the equilibrium point of the market.

Building Firm-Level Opportunistic Strategy. Entrepreneurs and entrepreneurial firms identify and exploit opportunities that rivals have not observed or have underexploited (Sharma & Chrisman, 1999). To build and maintain a competitive advantage through which entrepreneurial opportunities can be identified and exploited, firms must hold or have access to heterogeneous and idiosyncratic resources that current and potential rivals cannot easily duplicate (Amit & Schoemaker, 1993; Barney, 1991).

In the past decade, entrepreneurship researchers have focused on entrepreneurship as a process [e.g., Bull & Willard [, 1993 #7998]; Bygrave & Hofer (1991); Covin & Slevin (1991); Gartner (1989);(1996b)]. Opportunity recognition may be the critical first step of the process (Hills, 1995; Timmons, Muzyka, Stevenson, & Bygrave, 1987). Bygrave (1989) and Stephenson and Jarillo-Mossi (1986) view entrepreneurship as the process of creating value by combining resources to exploit an opportunity. And, the pursuit of the opportunity may occur regardless of resources controlled.

In effort to identify entrepreneurial opportunities, Alvarez and Barney (2002) highlight the importance of entrepreneurial alertness as an entrepreneurial resource. In particular, they call on Kirzner's (1973) views that entrepreneurs often have special insight into potential market disequilibrium opportunities. But, where does this 'insight' come from? As noted above, some scholars have suggested an entrepreneur's, or an entrepreneurial firm's, acquired knowledge and experiences contribute materially to 'insight'. Knowledge, which is justified true belief, is a critical intangible resource that helps firms identify and especially exploit opportunities to establish competitive advantages (von Krogh, Ichijo, & Nonaka, 2000). Sharma and Chrisman (1999) also purport that new knowledge is vital to organizational renewal. However, it is a delicate balance that must be concerned with the equally important tasks of simultaneously exploring (e.g., experimentation, discovery, and flexibility) for new knowledge and exploiting (e.g., efficiency, refinement, and execution) existing knowledge to create wealth (March, 1991).

Alertness and Asymmetry. Entrepreneurial alertness has typically been used to study individuals who identify new business venture opportunities. Though entrepreneurial attention is the construct applied in this dissertation, the two concepts share many similarities. However, entrepreneurial attention attempts to not only consider an individual or group's prior experiences and knowledge in their awareness, but also factors in an individual or group's dimensional limitations. For example, though an individual may have the knowledge to be alert or recognize an opportunity, she may not have the time in order to process the recognition.

Taking into account the importance of entrepreneurial alertness in prior literature, the remainder of this literature review will explore the applicability of entrepreneurial alertness and one of its specific components, information asymmetry in entrepreneurial strategies. Entrepreneurial identification occurs when entrepreneurial alertness exceeds a threshold level. Alertness is likely to be heightened when there is a confluence of several factors: (1) certain personality traits (creativity and optimism), (2) relevant prior knowledge and experience (providing information asymmetry), and (3) social networks (Ardichvili et al., 2003). *Entrepreneurial alertness* is the propensity to notice and be sensitive to information about objects, incidents, and patterns of behavior in the environment with special sensitivity to maker and user problems, unmet needs and interests, and novel combinations of resources (Ardichvili et al., 2003; Bhide, 1996). Further, in keeping with several scholars, personality characteristics and the environment interact to create conditions that foster higher entrepreneurial alertness (Ardichvili et al., 2003; Gaglio & Taub, 1992; Hisrich & Jankowicz, 1990; Sathe, 1989; Shapero, 1975).

The assumption is that the more alert one is, the more likely an opportunity will be recognized. However, Busenitz (1996) conducted an empirical test of Kaish and Gilad's (1991) proposition that entrepreneurs are more alert to new opportunities and use information differently from managers. He found little empirical support for this proposition. Busenitz concluded that the measures of entrepreneurial alertness need further development.

One component of entrepreneurial alertness that has recently received much attention from scholars is information asymmetry and prior knowledge. Based in Austrian Economics, Hayek (1945) contends that entrepreneurship exists because of information asymmetry between different actors. Examining how individuals acknowledge and understand new information, Von Hippel (1994) suggests that people tend to notice information that is related to information they already know. Shane (2000) draws from both of these prior works. He asserts that entrepreneurs will discover opportunities because prior knowledge triggers recognition of the value of the new information. Shane (2000) found that any given entrepreneurial opportunity is not obvious to all potential entrepreneurs (the rationale being that all people do not possess the same knowledge at the same time; Kirzner, 1997). This study also suggests that each person's idiosyncratic prior knowledge creates a "knowledge corridor". This corridor allows him/her to recognize certain opportunities, but not others (Hayek, 1945). Three major dimensions of prior knowledge are important to the process of entrepreneurial discovery: (1) prior knowledge of markets, (2) prior knowledge of ways to serve markets, and (3) prior knowledge of customer problems.

Summary

An explanation of the discovery and development of opportunities is a key part of entrepreneurship research (Venkataraman, 1997). Elements of opportunities may be recognized, intentionally or accidentally. However, the realization of the potential value from opportunities is a task that requires strategic forethought. Careful investigation of and sensitivity to market needs, as well as an ability to spot suboptimal deployment of resources, may help an entrepreneur begin to develop an opportunity (Ardichvili et al., 2003). Ardichvili, Cardozo and Ray (2003) suggest that "opportunity development" rather than "opportunity recognition" or "opportunity perception" should be the principle focus of this stream of research. The mere recognition or perception of opportunity cannot become a viable business without development. These scholars emphasize the opportunity development process. They examine entrepreneurial identification, evaluation, and development as a continuous stream of events.

This idea of 'opportunity development' brings this literature review of strategic entrepreneurship full circle. Opportunity seeking is likely to have the greatest impact in established organizations when undertaken at the strategic level. At this level, organizational planning and resource allocation occurs. It does not matter whether one ascribes to the propositions that opportunities exist and are waiting to be discovered or, alternatively, that opportunities are created. The key is that those managing the organization have the greatest ability to create a firm-level strategy that garners the highest probability of developing opportunities.

CHAPTER IV

THEORY AND HYPOTHESES BUILDING

Rumelt, Schendel, and Teece (1991) suggest that explaining how firms behave is one of the fundamental issues or questions that define the field of strategy, its priorities and concerns, and the contribution it makes to the theory and practice of management. In particular, explaining how firms behave allows us to comprehend whether and when firms are able to adapt to changing environments, whether they successfully change their strategies and capabilities, or whether they fail to respond adequately to competition (Ocasio, 1997). Seeking explanations of firm behaviors and adaptations to changing environments is more important today than ever before, as today's business environment is in constant flux. No industry is immune from radical restructuring and external discontinuities. Threats and opportunities can arise from anywhere. Too often management is blindsided by such discontinuities.

Here, I suggest that most companies view the world from the inside out. That is, they tend to assess their own capabilities first, compare themselves to their traditional peers within traditional industry boundaries, and convince themselves that incremental improvement along the usual measures is the best way to move forward. The inherent limitation of this inside-out perspective is that it beseeches outside perspectives. Consultants and new employees are able to provide distinct, valuable perspectives. However, each has their limitations. Consultants may have little incentive beyond their fee to see that a company's strategy is successful. Also, consultants may offer a very general level of strategic advice that isn't sufficiently fitted to the organization's

competencies and overall direction. Deviation between an organization's strategic plan and the organization's subsequent performance can be, and often is, attributed to causal ambiguity. Therefore, despite selling expertise that may be ineffective, the long term reputation of the consultants may not be damaged at all. New employees can initially offer a unique, outsider's perspective while they are gaining an understanding of more firm specific information. Of course, over time employees will become socialized and adopt perspectives that are more congruent with the organization's status quo. In light of these limitations, the most valuable perspectives for environment-organization fit may come from other boundaries of the firm.

In this chapter, it is proposed that the board offers a distinctive perspective that may be both well informed regarding the organization and partially independent of the firm's socialization. The placement of the board at the boundary of the firm is not the only characteristic that gives the, especially outside, board members an advantageous, value-creating position. They also provide an important intersection between the firm and its environment. It is the combination of quality outsiders with knowledgeable insiders, who know the day-to-day strategists and convey firm specific information to outside board members, which gives the board such potential to create firm value. Boards can provide management with a valuable service by viewing the broader business landscape and helping management to recognize major opportunities and discontinuities that will affect the firm. When it comes to an environmental shift, boards can be especially helpful in identifying blind spots where the top management's experience base is lacking.

The power of the board as a competitive resource depends on the quality and diversity of directors. Without the right composition, the dialogue may never ensue; the board's competitive power may never get released. Boards are in a structural position that not only allows them the ability to comprehend the firm's value creating competencies (insider perspective), but also are able to assess the firm's environmental opportunities and threats with legitimacy, value and relevance to the organization (outsider's independent perspective). The order that such issues are addressed on a board agenda, if the item makes it onto the agenda, results from the cultural, social, and economic forces that govern the attention of the board. Outside the board room, directors are likely to allocate attention to environmental stimuli associated with highly valued issues that serve to enhance their interests and identities. Consequently, each director may have a unique perspective on issues inside, tangential to, and outside the firm. Each issue's relevance to the firm and the board's attention may be specific to the individual director's perspective.

More than ever, outside directors influence the process of nominating new board members (Charan, 1998). In 2002, Congress passed the Sarbanes-Oxley Act of 2002, which was signed into law by President Bush on July 20, 2002. Sarbanes-Oxley applies to U.S. publicly-owned companies. The provisions for restructuring company board of directors have a 24 month phase-in period. In tandem, the New York Stock Exchange and the Nasdaq are now requiring each listed company to have a board composed of a majority of independent directors.

In addition, the NYSE recently ruled that a listed company will be required to have a nominating/corporate governance committee composed entirely of independent directors. Nasdaq will not require listed companies to have a nominating/corporate governance committee, but it will require all director nominations to be approved by either an independent compensation committee or a majority of the independent directors. To accommodate these new rules, board nominating committees are working with search firms and extending the invitation to new members.

As noted in chapter II, prior literature recognizes that directors sometimes serve as an interface between the firm and its environment in the acquisition of needed resources (resource dependence). The resources provided by a director may be access to financial, political, social, or human capital. Clearly, the director's specific human capital, such as expertise in a specific domain, is valuable. In addition, the general knowledge that directors possess may be just as valuable through identifying new opportunities and potential threats. By combining the specific knowledge of the inside directors with the typically broad strategic knowledge and experience of the outside directors, a unique situational environment may be created in the boardroom that can identify relevant opportunities that appear outside the 'field of vision' of insiders alone.

Pattern of Organizational Attention: Beginning with the Board

In 1947, Simon first proposed a new perspective that departed from economists' theories of rational choice. He highlighted the limits of human rationality in explaining how managers make decisions. Simon suggested that individuals have bounded attention and, consequently, are characterized by bounded rationality. For Simon, organizations

influence individual decision processes by allocating and distributing the stimuli that channel the attention of managers in terms of what selected aspects of the situation are to be attended, and what aspects are to be ignored. Firm behavior is both a cognitive and a structural process. Decision-making in organizations is viewed as the result of both the limited attentional capacity of individuals and the structural influences of organizations on an individual's attention (Ocasio, 1997).

The primary intention of the attentional perspective is to explain firm behavior by suggesting how firms distribute and regulate the focus of their decision-makers. Building on Simon's ideas, Ocasio (1997) suggested that decision makers attend to issues and answers based on: (1) the focus of their attention, (2) the situation in which their attention is focused, and (3) the rules and procedures of communication that structure decision-makers attention. A focus on the structuring of organizational attention to explain firm behavior is of special interest and importance for our understanding of strategic choice (Child, 1972). The firm in Ocasio's view is an open social system. Through attentional processing and decision-making, the inputs from the environment are transformed by the organization into a set of outputs – the organization's actions.

The primary objective in this chapter, through the use of Ocasio's (1997) attentional framework, is to develop a general process view of how boards behave in different contexts, situational and environmental. An all inclusive theoretical and empirical study of boards' attention structures and resulting actions are far more than can be completed in this dissertation. The focus here is on boards' attention structures as

they relate to the pursuit of perceived opportunities – strategic and entrepreneurial. A model is developed to provide a set of implications of how attentional processing helps explain when, why, and how organizations adapt to changes in their environment (Astley & Vandeven, 1983; Ocasio, 1997). The view is segmented into three stages of attentional process – *focus of attention, situated attention,* ***and*** *structural distribution of attention.* These three stages, and their more specific components, are applied to better understand how the board of directors' attention is allocated.

Focus of Attention. As noted, attention is a limited resource. The *principle of focus of attention* indicates that decision-makers will be selective in the issues and answers they attend to at any one time and that what decision-makers do depends on the issues and answers they focus their attention on (Ocasio, 1997). This selective focus of attention facilitates perception and consideration towards the object or idea being considered, and logically away from others. Consequently, the selective focus of attention will influence what actions (or inactions) are selected. Naturally, boards of directors can be presumed to follow the principle of focus of attention as their actions likely derive from the issues and answers that have received the most board attention.

Situated Attention. Attention is limited and capricious. Attention can often be easily prompted or diverted by relatively small, peripheral issues. This connotes weakness of attention. However, it is 'tangential attention', based on seemingly semi- or irrelevant knowledge, which may lead to opportunity identification. The *principle of situated attention* suggests that what decision-makers focus on, and what they do, depends on the particular context in which they are located. It implies that individual

decision-makers will vary their focus of attention depending on the situation. Also, the consistency (or variance) in attention and behavior is dependent more on consistency (or variance) in the characteristics of the situation rather than characteristics of the individuals (Ocasio, 1997).

Situated attention explores: (1) the intersections where individuals make decisions in specific contexts, and (2) how the organization and its environment shape the situations in which individuals find themselves. Decision-makers react to situations as shaped by the organization and its environment. In the case of organizational decision-making and action, the principle of situated attention highlights the effects of the organizational and environmental contexts in shaping individuals' focus of attention and action (Ocasio, 1997).

The board's situated attention is affected by internal firm structures and procedures (formal and informal), as well as external firm environmental structures and experiences. For the board as a whole, factors such as where the board meetings are held, how long the meeting are, what industry the firm competes in, and how the firm is situated in the general environment are all potential determinants of board attention allocation. At the individual director level, each outside director comes to the board with a unique perspective that is shaped by their experiences and knowledge. Each director must determine how they will interrelate with the structure and interactions of the current board. Therefore, the perspective from which the board of directors, as strategic decision-makers (or evaluators), frame their scarce attention is crucial to the likelihood of a firm implementing entrepreneurial strategies and actions. The actions of the board

and all other decision-makers are triggered by the issues and answers with which they are familiar.

Structural Distribution of Attention. Simon (1947) contends that the firm's economic and social structures create, channel, and distribute the attention of decision-makers into discrete processes. Organizational actions and decisions result from the complex interactions among these discrete attentional processes. He further describes organizational behavior as a complex network of attentional processes.

The *principle of structural distribution of attention* proposes that the particular context decision-makers find themselves in, and how they attend to it, depends on how the organization's rules, resources, and social relationships regulate and control the allocation of issues, answers, and decision-makers within specific firm activities, communications, and procedures (Ocasio, 1997). Accordingly, each level of decision-making in the firm involves certain procedures and communication processes that focus attention on specific issues and answers. This perspective provides an alternative explanation for firm behavior -- both to theories of rational choice, such as game theory and agency theory, and to theories that emphasize environmental determinism, such as population ecology (Ocasio, 1997).

Boards of directors and others in the firm are subject to this principle. For instance, the board conducts its business subject to a specific context constructed of a firm environment, an industry environment, and a general environment. The communication channels and procedures that exist among the inside and outside directors adds complexity to the boardroom context and may have social and political

effects on board dynamics. Specifically, the chairperson's board agenda formally allocates board meeting time and thus, the issues and answers discussed. Each of these effects may also have ramifications for the individual directors, both within the board and in outside relationships. All of these contextual items iteratively affect the attention structures of the board as a whole and the directors individually. Also, the board utilizes procedures and communication channels to disseminate and focus attention throughout the organization. However, a large part of the board's purpose is to focus the attention of top management. Through this process, the top management may design the organization to properly attend to matters deemed most important by the board.

Shaping Board Attention

Utilizing the three principles of an attention-based model of the firm, as presented by Ocasio (1997) and briefly described above, this broad model of organizational attention and behavior is enriched by exploring the board of directors, which may be crucial as a strategic juncture between the firm and its environment. As noted previously, a determination of the influence and effect boards have on the strategic attention of the firm is an incredibly broad task. Therefore, this study focuses only on the board's influence and effect on strategic entrepreneurship. As noted in Chapter III, the concept of strategic entrepreneurship refers, in part, to a firm's perpetual attempt to pursue opportunities that may become future firm competencies. These opportunities must be recognized and championed by someone with the power to gain the attention of the firm's decision makers. Based on this stream of logic, certain board members are in a strategic position to uniquely view the firm from a non- or less-socialized, outsider's

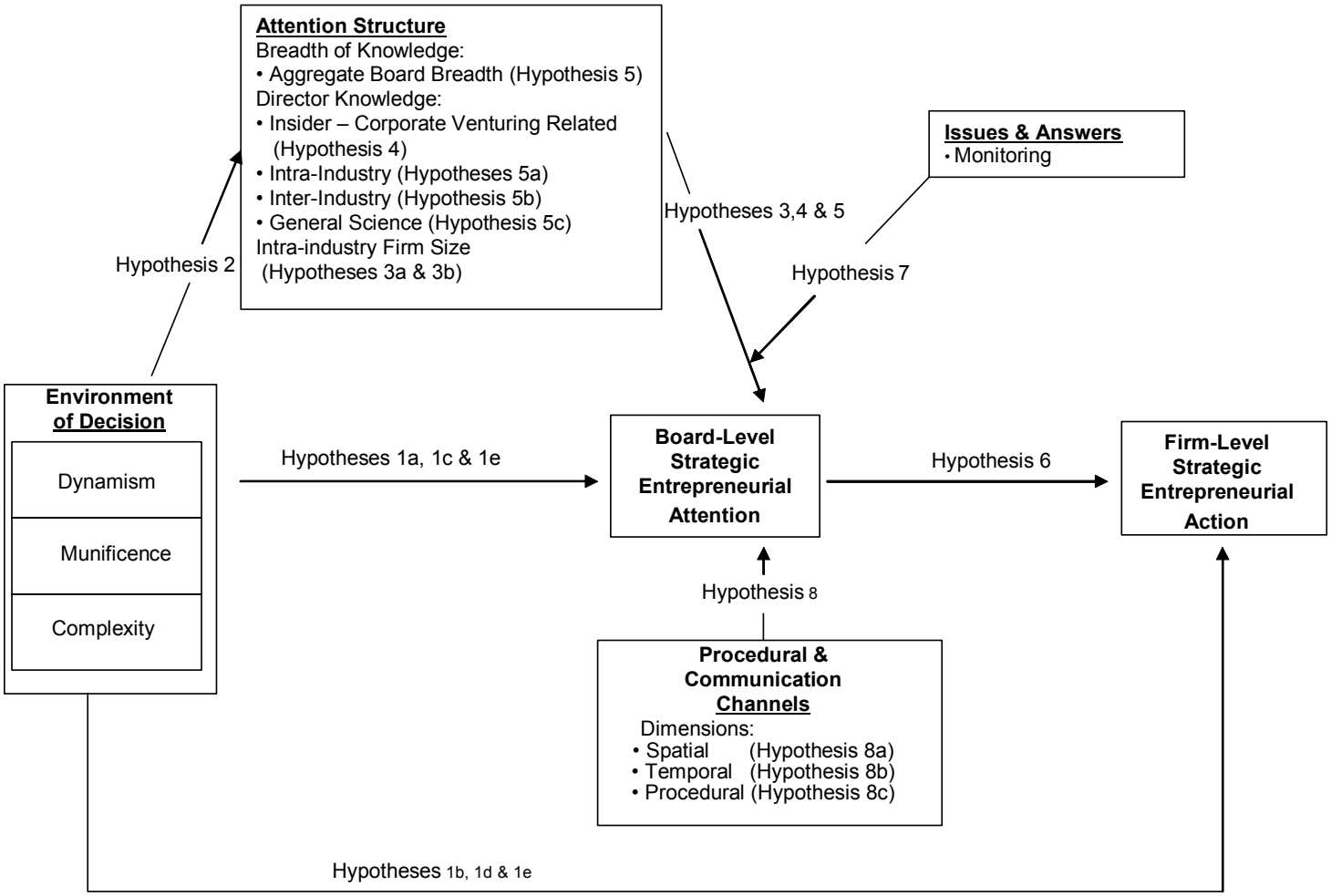
perspective (relative to long term management or insider directors). This view may more accurately pinpoint where the firm is relative to others in its industrial environment and the general environment. It may also allow the board to recognize potential opportunities that are hard to see from exclusively inside-out or outside-in the firm. Figure 1 graphically summarizes the hypothesized relationships between the board of directors' attention and the firm's actions toward strategic entrepreneurship.

Environment of Decision

The environment of decision (Barnard, 1938) encompasses the multiple material, social, and cultural factors, both internal and external to the firm, that impinge upon any decision activity (Ocasio, 1997). In an attention based model, the firm's environment provides the raw stimuli for the structuring of organizational practices and decision-making (Barnard, 1938; Ocasio, 1997). However, an organizational environment is too complex for any boundedly rational person, or even all boundedly rational persons, to make sense of completely and accurately. Nevertheless, decision-makers must make efforts to control the situational ambiguity of their environment, at least as well as their competitors.

Weick (1995) offers insight into a form of sensemaking that is particularly applicable to boards of directors. He suggest that interactive intersubjectivity, which means controlled information processing, makes severe demands on participants attention. This type of subjectivity is often perceived to be detrimental in hierarchical

Figure 2 A Top-down Process of Strategic Entrepreneurial Attention and Resource Allocation



Note: This model is adapted from Ocasio's (1997) conceptualization of the Attention-Based View

organizations. In the board room where the power structure is much flatter, directors can and should actively challenge each other's subjective sensemaking. This process creates situations where learning, and thus more accurate sensemaking, can take place. Through this enactment of issues and answers, the boardroom decision-makers selectively restrict their attention to a limited set of stimuli. Intuitively, the sensemaking of the board may only be as good as the directors' individual ideas, their knowledge of their environments and the firm's place in its environment.

The study of the environment-organization interface has been an important topic in the organizational theory and strategic management literatures (Keats & Hitt, 1988). Researchers have investigated the relationships between environmental characteristics and organizational characteristics, such as: (1) strategies (Eisenhardt, 1989a; Fredrickson & Mitchell, 1984; Goll & Rasheed, 1997; Sutcliffe & Zaheer, 1998), (2) structures (Burns & Stalker, 1961; Keats & Hitt, 1988; Lawrence & Lorsch, 1967), and (3) performance (Hannan & Freeman, 1977; Li & Simerly, 1998). As the resource environment becomes richer or leaner, more or less stable, more homogeneous or heterogeneous, or more concentrated or dispersed, the options available to organizations change accordingly (Galaskiewicz, 1985).

The premise behind these streams of research is that external environments impact firm performance, and organizations must take into account environmental characteristics when formulating strategies and structures (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Thompson, 1967). An organization's environment creates *uncertainty*, defined as "the degree to which future states cannot be anticipated or

accurately predicted" (Pfeffer & Salancik, 1978). Uncertainty makes it more difficult for organizational leaders to formulate and implement strategies and structures.

One area of board research that has received relatively little attention is the nature of the relationship between board attributes and contextual factors (Zahra & Pearce, 1989). Contextual factors include both internal and external forces that influence the direction and magnitude of organization activities. External forces have undergone considerable examination in organization theory (Barnard, 1938; Hannan & Freeman, 1977). This research stream demonstrates the importance of environmental factors to the survival and performance of organizations, especially with respect to the development and maintenance of resources flows. Through their impact on resource flows, environmental factors play a vital role in organizational outcomes. The linking of the organization with those environmental factors is one of the major functions of the board of directors. It is possible that a firm's environment and the uncertainty associated with it play a significant role in its board of director's attention.

Negotiating uncertainty has always been a major issue for organizations (Cyert & March, 1963). Thompson (1967) considers dealing with uncertainty as the essence of the administrative process. Independently, however, uncertainty is not necessarily problematic. In fact, many opportunities derive from uncertainty. Of course, uncertainty is heterogeneous among industries. Uncertainty becomes problematic when the uncertainty involves important interactions and transactions with elements of the environment that are vital for the organization (Pfeffer & Salancik, 1978). When situations of exchange and competition are uncertain and problematic, organizations

attempt to establish linkages with elements in their environment and use these linkages to access resources, stabilize outcomes, and avert environmental control (Pfeffer & Salancik, 1978).

In brief, the *task environment* refers to those external elements with which the focal organization has direct interaction and that: (1) influence the achievement of organizational goals, (2) use the same resources, (3) compete directly with the organization or produce close substitutes, or (4) are customers or potential customers (Dess & Beard, 1984; Starbuck, 1976). The task environment contrasts with the *general environment*, which consists of all other external elements that impact the firm only indirectly. Consequently, the firm is primarily concerned with elements of its task environment, though firms are not unconcerned with the elements of the general environment.

Starbuck (1976) presented an exhaustive review of the organizational task environment literature. He concluded that prior research suggested nearly as many distinct dimensions of the task environment as the number of studies done on it. In an attempt to simplify and sort out the environmental literature, Aldrich (1979) categorized the task environment into six dimensions. In a successive study, Dess and Beard (1984) used factor analysis to collapse Aldrich's six dimensions into three. In this factor analysis, the fourth and fifth factors were significant, but together explained less variance than the third factor alone. Consequently, Dess and Beard retained only three factors for their analyses. These three resulting dimensions are similar to dimensions proposed in prior literature (e.g. Mintzberg, 1979; Pfeffer & Salancik, 1978; Jurkovic,

1974; Pfeffer & Salancik, 1978). They are nearly indistinguishable from the most crucial environmental conditions identified by Child (1972): illiberality, variability, and complexity (Dess & Beard, 1984). These three dimensions -- *dynamism*, *munificence*, and *complexity* -- have subsequently dominated empirical studies (e.g., Keats & Hitt, 1988).

Authors have employed both perceptual (e.g., Boyd, Dess, & Racheed, 1993; Lawrence & Lorsch, 1967) and objective (e.g., Dess & Beard, 1984; Milliken, 1987) measures to quantify a firm's task environment. Bluedorn's (1993) extensive review of the environmental literature concludes that objective measures of dynamism, complexity, and munificence still constitute the principal way to describe and conceptualize the fundamental properties of organizational environments. He suggests that these dimensions affect an omnibus perception of the environment: uncertainty. The relationships between dynamism, complexity, and munificence are summarized and linked to boards of directors in the following sections.

Dynamism. *Dynamism* refers to the instability of a firm's environment, represents change that is difficult to predict, and creates uncertainty for a firm's management (Dess & Beard, 1984; Jurkovic, 1974; Miles, Snow, & Pfeffer, 1974). Miles, Snow, and Pfeffer (1974) note that it is imperative to distinguish between the rate of environmental change and the unpredictability of environmental change. Rapid change that is predictable by management does not represent uncertainty (Pfeffer & Salancik, 1978). For example, Lawrence and Lorsch (1973) suggest that seasonal

fluctuations represent rapid change, but these changes are predictable by management and do not result in heightened uncertainty.

Dynamism closely follows Aldrich's (1979) idea of *environmental turbulence* -- externally induced changes that are obscure to administrators and difficult to plan for. Environments constantly undergo incremental change. Dynamism represents radical and unpredictable change, such as revolutionary periods. They interrupt periods of equilibrium, as suggested in Gersick's (1991) punctuated equilibrium paradigm. These changes might also include the discontinuous shifts that break periods of incremental change, as discussed by Keck and Tushman (1993) in their examination of environmental shifts.

Highly turbulent environments represent the high end of the dynamism continuum (Bluedorn, 1993). Executives in these environments must have the ability to adapt quickly to cope with these constant and ambiguous changes (Galbraith, 1973). Increasing levels of dynamism result in heightened environmental uncertainty for organizational leaders (Duncan, 1972; Li & Simerly, 1998). Dynamic task environments are characterized by frequent, nonperiodic change that is not easily foreseen by management. Consequently, managers of firms with dynamic task environments often establish environmental linkages to provide them with information that will allow better anticipation of both the nature and rate of future change. According to Duncan (1972), these types of environmental changes may dramatically impact firm structures and operations. Keck and Tushman (1993), for example, suggest that environmental jolts

may be related to changes in executive team structure and processes. These environmental jolts are posited to be related to board structure and processes.

A number of empirical studies have examined the association between dynamism and firm performance, strategies, and structures. Keats and Hitt (1988) investigated 110 large manufacturing firms. Dynamism, which they referred to as instability, was found to be negatively associated with diversification and operating performance, but positively with market performance. Dollinger and Golden (1992), using a sample of smaller firms, found a negative relationship between dynamism and operating margins. They found no association between dynamism and interorganizational relationships. McArthur and Nystrom (1991) found a negative relationship between dynamism and return on investment. They also found that dynamism moderated the relationship between firm strategy and performance. Bergh and Lawless (1998) provide some evidence to suggest that dynamism moderates the relationship between diversification strategy and portfolio restructuring. Simerly and Li (2000) reported that dynamism moderated the relationship between capital structure and firm performance.

Empirical studies have also explored the relationship between dynamism and the characteristics of boards of directors. Li and Simerly (1998) found that dynamism moderated the relationship between inside director equity ownership and firm performance. Their results suggest that the relationship between inside director equity ownership and firm performance is stronger for firms in industries with high levels of dynamism. Boyd (1995), however, reported no evidence to support his hypothesis that

dynamism moderates the relationship between board leadership structure and firm performance.

In summary, theory suggests that increasing levels of environmental dynamism result in heightened uncertainty for organizational leaders (e.g., Duncan, 1972). However, the empirical evidence suggests inconsistent relationships between this uncertainty and firm performance, organizational structures, and firm leadership characteristics. Most notable, though, are the inconsistent findings regarding the relationship between environmental dynamism and firm performance. A number of studies suggest a negative relationship between dynamism and firm performance (e.g., Dollinger and Golden, 1992; Keats and Hitt, 1988). More limited evidence suggests a positive relationship between dynamism and market performance (e.g., Keats and Hitt, 1988).

Firms interfacing with dynamic environments will typically attempt to reduce the effects of dynamism and, thereby, reduce the uncertainty that surrounds the strategic decisions organizational leaders must make. One function of boards is to enhance the ability to cope with uncertainty and unpredictability by bringing improved, broader, or more general, environmental information to the firm's decision makers' attention. The improvement comes in the form of higher quality of information and better interpretation of it. The information processing competency that outside directors bring improves top management's potential capacity for predicting environmental changes. Consequently, based on the value of general environmental information, firms in more dynamic

industries will need to have a higher proportion of board members representing different aspects of the firm's task environment.

Munificence. Environmental *munificence* refers to the scarceness or abundance of critical resources needed by the firm or firms operating within a particular environment Castrogiovanni (1991). Munificence indicates the environment's ability to influence the survival and growth of firms sharing that environment (Dess & Beard, 1984; Keats & Hitt, 1988; Pfeffer & Salancik, 1978; Starbuck, 1976). Munificence provides firms with high resource availability, easy access to necessary resources, and affords the opportunity to generate slack. Slack is integral to organizational survival because it provides a buffer against lean times and increases the firm's opportunities for innovation. A firm with organizational slack tends to place less emphasis on conserving its resources and experiences less constraint on strategic choices (Chakravarthy, 1984). Rajagolpalan, Rasheed, and Datta (1993) state that uncertain environments that are also munificent (e.g., high growth industries in initial stages of industry evolution) are very different from uncertain environments which are far less munificent (e.g., mature industries with declining demand or increasing competition).

In highly munificent environments, survival is relatively easy and allows firms to pursue goals other than survival (Castrogiovanni, 1991). In fact, highly munificent environments provide for significant organizational growth. This growth allows organizations to buffer themselves from external threats and helps them to amass slack resources, which can be employed in more scarce periods (Cyert & March, 1963). Slack provides organizations with greater flexibility and more growth opportunities (Aldrich,

1979). However, high levels of free cash flow may also result in a multitude of agency problems (Finkelstein & Hambrick, 1996; Jensen, 1986).

In environments with low levels of munificence, resources are scarce. This adversely affects both firm profitability and organizational slack (Castrogiovanni, 1991). Consequently, firm survival becomes the primary goal. According to Goll and Rasheed (1997), firms in nonmunificent environments must devote greater effort to understand external threats. In addition, managerial decisions become magnified when resources are scarce. The losses associated with faulty decisions may be highly damaging to organizations continued viability. Due to these disadvantages, the potential for new competitors diminishes as prospective entrants observe the low resource levels and decide to instead search for new opportunities in more resource abundant environments. Hence, low munificence induces firms to seek ways to enhance resource accessibility and availability.

Prior literature has investigated the relationship between munificence and each of the following: organizational strategies, structures, and performance. Goll and Rasheed (1997), for example, found among a sample of large manufacturing firms that munificence moderated the relationship between rational decision-making and firm performance, as measured by both return on assets and return on sales. Their results suggest that rational decision-making is most strongly associated with performance in highly munificent environments. McArthur and Nystrom (1991) also found evidence to document the moderating impact of munificence on the relationship between strategy

and performance. Dollinger and Golden (1992) found a positive relationship between munificence on both sales growth and interorganizational relationships.

Another stream of research, more directly relevant to this study, assesses the impact of munificence on the characteristics of boards of directors. Staw and Swajkowski (1975), for example, found that firms in environments with low munificence were more likely to commit illegal acts; thus, suggesting that boards need to monitor more closely. McLean Parks and Conlon (1995) investigated the impact of munificence on monitoring and found that agency theory predictions prevailed only in munificent environments. Boyd (1995) found that CEO duality was positively related to performance in munificent environments. Wiersema and Bantel (1993) presented results that suggest a positive relationship between munificence and strategic change, as well as between munificence and top management turnover. In other words, although organizational leaders operated in environments with high levels of slack to create a comfortable context, they still felt the need to alter the strategies of their firms.

One of the roles of the board is to facilitate the firm's access to resources. According to the resource dependence perspective, firms in less munificent environments depend more heavily on the interorganizational links that directors bring to the board. Therefore, firms in industries with low munificence will, presumably, have a high proportion of board members from within the task environment. Firms in munificent environments are likely to experience greater slack and more opportunities for innovation and internal integration. For these firms, board composition should reflect the firms' lower concern with sources of supply and distribution of output (as resources

are abundant, by definition). Thus, munificence may lead to less focus on external resource acquisition on the part of the board.

In conclusion, the theoretical literature suggests that organizational leaders are likely to prefer operating in munificent environments. However, empirical studies fail to report a consistent relationship between environmental munificence and firm performance (e.g., Dollinger & Golden, 1992; Keats & Hitt, 1988). Many empirical investigations report that munificence moderates the relationships between firm strategies and decision-making and firm performance. Empirical evidence suggests that munificence is associated with organizational leaders' actions and characteristics. Taken together, environmental munificence is associated with firm strategies, structures, performance, and organizational leader characteristics. The direction of these relationships, however, is inconsistent.

Complexity. *Complexity* refers to the heterogeneity associated with an environment (Child, 1972; Dess & Beard, 1984; Duncan, 1972; Thompson, 1967). Firms in increasingly complex environments transact with a wider array of inputs and outputs and encounter a larger number of highly differentiated environmental actors. This makes resource acquisition and disposal more difficult. As a firm's environment becomes more complex, executives must deal with more stakeholders whose demands may conflict (Dess & Beard, 1984). Accordingly, executives operating in complex environments confront more uncertainty than managers operating in simple environments (Dess & Beard, 1984). The information processing demands requisite in more complex

environments represent an inherently more difficult management task (Dollinger & Golden, 1992; Wiersema & Bantel, 1993).

According to Sharfman and Dean (1991), complexity can result from industry concentration (e.g., Starbuck, 1976), product diversity (Thompson, 1967), or technical intricacy (Mintzberg, 1979). The complexity that has been described and operationalized as the level of industry competition (Boyd, 1990) is considered part of this larger conceptualization of complexity. Most recent investigations of complexity focus on industry concentration (e.g. Keats & Hitt, 1988). Industries with low monopoly power and few competitors represent less complex environments. Fragmented industries with many competitors indicate more complex environments (Dollinger & Golden, 1992).

Some empirical work has investigated the impact of complexity on firm strategies, structures, and performance. Keats and Hitt (1988) found some evidence that environments with low levels of complexity supported growth. McArthur and Nystom (1991) reported that complexity significantly moderated the relationship between firm strategy and performance. Dollinger and Golden (1992) found a positive relationship between complexity and relative competitor performance. They also found that more complex industries (defined as more fragmented industries with more competitors) were associated with fewer cooperative strategies. In contrast to the findings of Dollinger and Golden (1992), Wiersema and Bantel (1993) reported a negative relationship between complexity and firm performance. These conflicting findings may have resulted from the differences in data sources for firm performance. Dollinger and Golden relied on perceptual measures obtained from managers. Wiersema and Bantel relied on more

objective measures from publicly reported sources. Additionally, these conflicting findings may have resulted from differences in sample contexts; Dollinger and Golden studied smaller entrepreneurial firms, both data sources and sample compositions could have accounted for the inconsistent results.

There also exists a stream of empirical research that advocates the impact of complexity on characteristics of boards of directors. Boyd (1995) found evidence of a positive relationship between CEO duality and firm performance for firms operating in highly complex environments. Boyd (1990) found a negative relationship between uncertainty and board size, a positive relationship between uncertainty and director interlocks, and a moderating effect of performance on both relationships. Despite the above studies, there has been relatively little empirical research specifically examining the dimensions of the task environment with the attributes of top management teams or boards of directors.

In comparison to both environmental dynamism and environmental munificence, the empirical evidence investigating environmental complexity is less substantial. The theoretical literature proposes a negative relationship between environmental complexity and firm performance. However, the empirical evidence reports an inconsistent relationship between these two variables. In addition, there is limited empirical evidence to suggest significant relationships between complexity and the characteristics of boards of directors.

Hypotheses: Environmental Context**.** Hypotheses are proposed to explore the relationship between each of these constructs of a firm's environmental context and

board-level entrepreneurial attention or firm-level entrepreneurial action. In these hypotheses, the construct of strategic entrepreneurial attention represents the amount of attention the board of directors allocates toward a firm's opportunity- and advantage-seeking strategies. Entrepreneurial attention is explored as attention focused on entrepreneurial indicators. These indicators that boards may discuss, which are based on previous theoretical and empirical works, include: (1) pursuing and evaluating opportunities (Shane & Venkataraman, 2000), (2) interpreting uncertainty as opportunities (McGrath & MacMillan, 2000), (3) coordinating with social/external networks , (4) proactiveness (Lumpkin & Dess, 2001), (5) innovativeness (Hitt et al., 2001), (6) risk-taking (Norton & Moore, 2002), (7) growth strategy (Peng & Heath, 1996), (8) acting regardless of resources currently controlled (Hitt et al., 2001), (9) long-term orientation (Hitt et al., 2001), and (10) wealth creation (Hitt et al., 2001). *Strategic entrepreneurial actions* are firm-level actions that can be categorized as either competency creating actions or existing firm competency leveraging actions. These actions are the fundamental behaviors of firms including (1) moving into new markets, (2) seizing new customers, (3) introducing new resources, and/or 4.) combining markets, customers, and resources in new ways (Smith & Di Gregorio, 2002).

Viewing board-level attention allocation and firm-level actions through an attentional-based model provokes questions about both the environmental context in which the firm competes (Figure 1: environment of decision) and the situational context (Figure 1: attention structures, issues and answers and procedural and communication channels) in which the board makes decisions. From this perspective's lens, it is not

enough to analyze a board decision or a firm action independent of its respective context. Rather, to make more complete sense of how such decisions and actions are derived, we must consider the environment and/or situation in which they were formulated and implemented. Decisions and actions do not happen in sociological, economic, physical, etc… vacuums. All happen in contexts which are nested in larger contexts.

The full model, depicted in Figure 1, suggests that board-level and firm-level attention structures (themselves posited to be affected by the firm's environmental context) will affect board-level strategic entrepreneurial attention as mediators. Subsequent to this effect, board-level strategic entrepreneurial attention will affect firm-level strategic entrepreneurial actions. But before examining the possible indirect effects of the environmental context on board-level strategic entrepreneurial attention and firm-level strategic entrepreneurial actions, the direct effects of the environmental context need to be considered. Therefore, with respect to each firm's (competitive) environmental context, the following hypotheses explore the associated direct impact that a firm's environmental context can have on board-level strategic entrepreneurial attention and firm-level strategic entrepreneurial actions.

> Hypothesis 1: A firm's environmental context (environment of decision) is related to the board-level strategic entrepreneurial attention and firm-level strategic entrepreneurial actions.
>
> *Hypothesis 1a: The level of environmental dynamism will be positively associated with board-level strategic entrepreneurial attention.*
>
> *Hypothesis 1b: The level of environmental dynamism will be positively associated with firm-level strategic entrepreneurial actions.*

Hypothesis 1c: The level of environmental munificence will be positively associated with board-level strategic entrepreneurial attention.

Hypothesis 1d: The level of environmental munificence will be positively associated with firm-level strategic entrepreneurial actions.

Hypothesis 1e: The level of environmental complexity will be positively associated with board-level strategic entrepreneurial attention.

Hypothesis 1f: The level of environmental complexity will be positively associated with firm-level strategic entrepreneurial actions.

Attention Structures

Attention structures are the social, economic, and cultural configurations that govern the allocation of time, effort, and attentional focus of board members and executives in their decision-making activities (March & Olsen, 1976; Ocasio, 1997). Attention structures regulate: (1) the valuation and legitimization of issues and answers, (2) the creation and distribution of procedural and communication channels, (3) and the interests and identities that guide decision-makers' actions and interpretations. Ocasio (1997) suggests four interacting factors as internal and external environment attention regulators*: rules of the game*, *players*, *structural positions*, and *resources*. Ocasio's regulators of organizational attention structures can be applied to a firm's board of directors through this study's adaptation of the attention-based model. The rationale for applying the attention structure regulators is as follows:

- First, the board's rules, resources, and social relations structure attention in board meetings and director interactions by generating a set of values that order the legitimacy, importance, and relevance of issues and answers.
- Second, these attention structures channel and distribute the decision-making activity within the board interactions into a concrete set of procedures and communications.
- Third, attention structures provide the decision-makers with a defined set of interests and identities.

The board of director's environment-firm boundary position facilitates attention structures that are unique to any other environmental intersection with the firm. Each of the four mechanisms that comprise the structural distribution of board attention are considered in more detail below. The four categories of attention structures are as follows:

Rules of the Game. Rules of the game are the formal and informal principles of action, interaction, and interpretation that guide and constrain decision-makers in accomplishing the firm's tasks and in obtaining social status, credits, and rewards in the process (Ocasio, 1997). Boards, not being entirely inside the organization or entirely outside the organization, should continually interpret and reinterpret what constitutes appropriate behavior in communications between directors. The board's (typically implicit) principles for action, interaction, and interpretation are collective human constructions that reflect the board's history and the history of the environment. This pattern greatly complicates our understanding and explanations of board behavior, as

rules must be historically and culturally situated in the social context in which they were derived and developed (Ocasio, 1997).

Boards must operate as what Barnard (1938) refers to as a cooperative system, whose common purpose is collective action. However, within this cooperative system of directors, it is naïve to neglect the potential presence of shifting political coalitions (Cyert & March, 1963). As is often the case between organizations, it is this very competition-cooperation dynamic between directors that may result in the epiphany of an opportunity that was previously unseen by the board. This opportunity can then be evaluated, which can be difficult if political factions within the board are still at odds. If deemed worthy of action, entrepreneurial strategies may be developed and, ultimately, become entrepreneurial actions by the firm. Long term historical norms, values, and principles of interaction of the board are unquestionably important. However, they also are incredibly difficult to fully understand. To begin to gain some understanding, future studies should explore the implications of historical interactions of the board and how these interactions impact later issues and answers. Intuition suggests that a board (composed of two factions -- one of insiders and another of outsiders) that has recently encountered serious governance issues may have difficulty shifting the boards attention toward strategic entrepreneurship as significant issue.

Players. *Players* are the individuals and groups of individuals in the organizational game who are important components of the firm's attention regulation (Ocasio, 1997). Players affect the firm's attention regulation through the specific skills, beliefs, and values they bring to the firm (March & Olsen, 1976). Top managers are key

players in organizations. Of course, there are additional players -- middle or divisional management, active board members, union representatives, institutional investors, consultants, etc… Each of these individuals or groups may affect the attention of decision-makers. Therefore, they can affect decisions.

Players may also draw decision-makers' attention to new issues or suggest new answers that are appropriate for the firm. The board of directors may act as players for this type of action. Boards are mandated as representatives of the shareholders to oversee the management of their firms. Based on this power by proxy, they command the attention of management. So with the attention of management, each director's perspective becomes a potential source of value. Perspectives of directors can affect the attention of the board which can then affect the attention of the management and ultimately result in firm actions. The following section explores the impact that individual directors have on the board's attention based on prior knowledge and experience.

Breadth of Knowledge. Unfortunately, most research on entrepreneurship investigates the entrepreneurial process after opportunities have been discovered (Fiet, 1996). However, Shane (2000) utilizes Austrian economics to portray the recognition of opportunities as distinctive cognitive feats whose accomplishment is conditioned by an entrepreneur's prior experience and education. More often, researchers have drawn on either neoclassical economic or psychological theories that assume people will discover the same opportunities in a given situation, or discover opportunities that are uncorrelated with the attributes of the discoverers. Neoclassical economics makes the

assumption of public knowledge about opportunities, which suggests that all opportunities must be equally obvious to everyone. Austrian economics challenges the validity of these assumptions, arguing that different people will discover different opportunities in a given technological change because they posses different prior knowledge (Venkataraman, 1997). Drawing from Hayek (1945), Shane (2000) suggests that opportunity discovery is a function of the distribution of information in society. Further, Shane's (2000) paper shows, through in-depth case studies, that entrepreneurs discover opportunities related to information that they already posses. Kirzner (1973) notes that once the assumption of complete information is relaxed, the discovery of opportunity cannot be understood through "mechanical computation" because any given individual cannot identify all possible opportunities.

Venkataraman (1997) asks, "why do people discover some entrepreneurial opportunities and not others?" One answer is that people recognize those opportunities related to information that they already possess. People have different stocks of information because information is generated through people's idiosyncratic life experiences. Also, because information is often distributed through a stochastic process, some people possess information that others do not have through blind luck (Nelson & Winter, 1982). As a result and at any given time, only some people will know about particular customer problems, market characteristics, or the ways to create particular products or services (Shane, 2000; Venkataraman, 1997).

Kirzner (1997) concludes that existing explanations for entrepreneurship are incomplete because they do not explain adequately the process of opportunity discovery,

a crucial component of the entrepreneurship process. Cognitive limits and the specialization of knowledge preclude entrepreneurs from identifying the complete set of entrepreneurial opportunities. Shane's (2000) results support Kirzner's (1997) idea that the process of discovery can be driven by recognition of knowledge already possessed rather than by search for knowledge needed. Consequently, individuals who have developed particular knowledge through education and work experience will be more likely than other people to discover particular entrepreneurial opportunities in response to a given technological change (Venkataraman, 1997).

Shane (2000) also found evidence that individual differences influence the discovery of opportunities in a way other than that generally described in the literature. Shane's study suggests that entrepreneurs discover opportunities, not because they have special attributes that make them better able to recognize opportunities (Schumpeter, 1934), but because idiosyncratic prior knowledge makes some people better able to discover certain opportunities than others. These findings reiterate the importance of individual differences to the entrepreneurship process, and demonstrate that entrepreneurship can not be explained solely by reference to factors external to individuals.

Appling Kirzner's, Shane's, and Venkataraman's ideas regarding entrepreneurship to strategic entrepreneurship in established enterprises, the relationship is explored between board of director 'breadth of knowledge', or composition of knowledge and prior information, and the allocation of roles that directors fulfill. Of particular interest is the role that boards take, in different situational contexts, toward

identifying strategic entrepreneurial opportunities and exploiting strategic entrepreneurial opportunities through firm actions.

Evidence suggests that at least some of the actions that lead first to creativity and subsequently to innovation result from a process called bisociation (Koestler, 1964). *Bisociation* occurs when a person combines two or more previously unrelated matrices of skills or information (Koestler, 1964; Smith & Di Gregorio, 2002). Bisociation takes place when individuals combine information to identify an opportunity or to help shape competitive advantages (Ireland et al., 2003). In general, the greater the breadth of individuals' knowledge, the more likely they will be able to use a bisociation decision process.

As noted throughout this dissertation, boards of directors were chosen due to the directors' unique boundary position between the firm and its environment. Boards typically are constructed, in various compositions, of both strategically chosen outsiders and key insiders. Prior research has explored a plethora of demographic variables related to directors. This study explores the composition of knowledge and information in the board room and how it is associated with a firm's entrepreneurial strategy and, ultimately, entrepreneurial actions in different contexts. To explore the values of different kinds of director knowledge and information, a typology of relative knowledge must be constructed. The categories below are adopted from Klevorick, Levin, Nelson and Winter (1995). These authors state that this typology was designed to: (1) lend greater precision to the knowledge concept, (2) develop various operational measures of an industry's technological opportunity, (3) and examine inter-industry differences in

technological opportunities. They apply this typology to industries. This study applies it to directors as representatives from different industries. The categories are as follows:

- General Scientific Knowledge – Klevorick et al. (1995) state that the most powerful and, over the long run, almost certainly the most important source of new technological opportunities has been the advance of scientific knowledge. Most significant breakthroughs can be traced directly to advances in basic general scientific understanding that occurred just prior to the breakthrough (Klevorick et al., 1995). The connections between scientific advance and technological advance are complex and subtle. The lags are long and the feedbacks intricate. Klevorick et al. (1995) reiterate prior findings that demand-based (or problem-based) entrepreneurial innovations are less risky than supply-based entrepreneurial innovations. However, this less risky type of innovation is consistent with less return. Few supply-based entrepreneurial innovations are highly successful by market standards. When one is successful, it is more likely to be a radical innovation with substantial returns. Myopic perspectives naturally occur from being embedded in certain situations. Who has the greatest likelihood of identifying a more radical entrepreneurial opportunity in such a situation? Those individuals who have not been socialized within a certain firm or its industry may come up with insightful, frame-breaking suggestions in a board setting. Consider the vast general knowledge that most outside directors have acquired by the time they are placed on a board. These directors can make suggestions that may seem outlandish to an embedded insider. Upon an iterative

discussion among a variety of perspectives, a suggestion may come to be seen as an opportunity worth researching further.

- Inter-Industry Knowledge – Knowledge in one industry can be cultivated from knowledge in another, sometimes a seemingly unrelated, industry. The creation of new general purpose components (e.g., power sources or electronic components) quite often opens new technological opportunities in a variety of industries (Klevorick et al., 1995). Also, product markets and uses are not always in the vision of industry insiders (e.g., typewriter industry only realized the threat of the computer after it was too late). A firm is not likely to fill a board seat with a director from a totally unrelated industry. However, directors who may have initially been intended to serve in a monitoring or resource access role on the board may end up providing the most value to the firm via a unique perspective.

  Advances in production process technology and equipment are often the result of work done by upstream suppliers. These advances can expand a downstream industry's perspective of potential opportunities. Improvements in the instruments, equipment, or know-how that firms in an industry use can also expand the set of perceived entrepreneurial opportunities for them. Consumers, or other downstream end-users, may also be able to identify (via suggestions and requests) opportunities for a firm or an entire industry.

- Intra-Industry Knowledge – More specific knowledge, relative to general scientific knowledge and inter-industry knowledge, may be available within a

given industry. In general, it is undesirable to have direct competitors from within an industry on a firm's board of directors. The involvement of having some directors who come from other organizations within the industry, but not direct competitors, may add value. This value may be in the form of a more accurate perspective of: (1) the industry, (2) the firm or, (3) the decisions that the board has made or is in the process of making.

- Within Firm Director Knowledge – The knowledge and information that individual inside directors contribute to board discussion may also shift the allocation of the board's attention. For example, an insider who has current or previous corporate venturing experience and knowledge may shift the focus of board attention toward more entrepreneurial strategies.

Hypotheses: Attention Structure. The origination of strategic entrepreneurship that is initiated or evaluated in the boardroom is the principle focus of this dissertation. As depicted in figure 1, it is hypothesized that certain board-level and firm-level attention structures mediate the relationship between the environment of decision and a board's meeting time allocation to strategic entrepreneurial attention. The first set of hypotheses explores the relationship between the environment of decision and aggregate board breadth of knowledge (hypotheses 2a-2c). Next, board (hypotheses 4, 5a-5d) and firm (hypotheses 3a and 3b) attention structures are hypothesized to impact strategic entrepreneurial attention. Each hypothesis considers one of the afore mentioned aspects of the firm's environment of decision or the board's situational context.

Hypotheses 1a – 1f examine the main effects of a firm's environmental context on board-level strategic entrepreneurial attention. As illustrated in Figure 1, hypotheses 2a-2c explore the theorized mediation of this relationship via certain attention structures consisting of board-level and firm-level characteristics. The first step in testing this mediation is exploring the association between the firm's environmental context and these attention structures.

The environment of decision is made up of a firm's competitive industrial environment. When decision makers of the firm choose courses of action or inaction, they do so within a context of varying industrial consequence and competitor reactions. The following set of hypotheses suggest that the breadth of the board or the type of directors that sit on the board are elected at least partially because their combination of knowledge bases compliment the firm-environment boundary interface. Following this model's logic, one can image that a firm in a very dynamic industry, such as the semiconductor industry, would probably seek out directors with very different knowledge bases than a firm in a much less dynamic industry, such as the concrete industry. Once the directors are selected and assembled, it seems logical that they will make decisions with the firm's environmental context in mind.

> Hypothesis 2: A firm's environmental context (environment of decision) is related to its board of directors' 'breadth of knowledge' (attention structure).
>
> *Hypothesis 2a: The level of environmental dynamism will be positively associated with board-level 'breadth of knowledge'.*

Hypothesis 2b: The level of environmental munificence will be positively associated with board-level 'breadth of knowledge'.

Hypothesis 2c: The level of environmental complexity will be positively associated with board-level 'breadth of knowledge'.

Resources. *Firm resources* are the human, physical, technological and financial capital available to the firm for achieving its goals (Ocasio, 1997). They are embedded in the organization's routines and capabilities and provide the organization with the collective skills to perform a wide variety of tasks (Nelson & Winter, 1982). Ocasio (1997) notes that the repertoire of answers is shaped, but not fully determined, by existing organizational resources. Attentional and resource constraints bias management toward continuing the exploitation and development of existing resources and routines. This is in contrast to developing new competencies, strategies and routines (March, 1991; Ocasio, 1997). Management's attentional constraints and biases result in a need for answers from individuals outside, or at the boundary, of the firm. Pure outsider individuals may identify novel opportunities, threats, and answers for the firm. However, the pure outsider's contribution may be irrelevant to the firm's current capabilities or potential future. The novel perspective of an outsider may be a strength (insightful) or a weakness (irrelevant). So, how can a firm strategically identify individuals who are likely to contribute new, relevant issues and answers?

Historically, small companies and start-up ventures have been relatively skilled at identifying entrepreneurial opportunities. But, they have been less effective at developing and sustaining the competitive advantages needed to exploit those

opportunities over time. In contrast, more established organizations have demonstrated relatively superior skills in terms of developing and sustaining competitive advantages (Ireland et al., 2003). But, they have been less effective in recognizing entrepreneurial opportunities that can be exploited with their resources and resulting capabilities. In brief, entrepreneurial and new venture firms tend to excel at opportunity-seeking behavior. Established companies typically excel in the exercise of advantage-seeking behavior (Ireland et al., 2003). Mosakowski (2002) suggests that firms with large resource endowments experience problems such as core rigidities, reduced experimentation, lower incentives to develop new resources, and enhanced strategic transparency to competitors.

Very similar to the environmental (competitive) context presented in the first two sets of hypotheses, the attention based model suggests that a firm's abundance of resources factor into the context in which decision makers allocate attention and ultimately assets. In an effort to gain a more complete picture of the environment that a board acts in, this study takes into consideration a firm's overall size. As a firm grows larger, and inherently more complex, more issues are bound to compete for decision makers' time. Within an industry, two firms of distinctly different sizes may have very different issues to address based on their respective sizes. Therefore, based on prior findings regarding firm size and entrepreneurship, the following is hypothesized related to the mediating impact of firm size between the environmental context and the board-level strategic entrepreneurial attention:

Hypothesis 3a: Within an industry, firm size will be negatively associated with board-level strategic entrepreneurial attention.

Hypothesis 3b: Within an industry, firm size will be negatively associated with firm-level strategic entrepreneurial actions.

Structural Positions. Structural positions are the roles and social identification that specify (1) the functions and orientation of decision-makers, and (2) their inter-relationships with other structural positions internal and external to the firm (Ocasio, 1997). To understand directors' attention allocations, a sense of their background is important. One characteristic that likely influences the perspective of directors is the structural positions they have occupied in the recent past and the ones they are presently occupying in addition to their role as a director. Structural positions provide directors with the interests, values and identities that regulate how they think and act when called upon to make or evaluate decisions.

Organizations have typically increased the specialization of structural positions because the general and task environments have become increasingly difficult to understand and predict for a single individual. Structural positions provide a source of differentiated attention to unique aspects of the organization's environment (Lawrence & Lorsch, 1967). This allows their occupants to focus their time and effort on certain issues and related solutions, while ignoring others (Ocasio, 1997).

The importance that management and shareholders give to certain issues and answers is partially suggested by who they nominate and elect to their firm's board of directors. The nomination and election of individuals who have served in particular

structural positions sends a signal of perceived importance and value. In considering firm-level entrepreneurial strategies, there are particular structural positions that signal a deliberate allocation of firm attention, such as research and development, corporate venturing, and acquisitions. If an individual fills such a structural position in the firm that is deemed valuable and needed on the firm's board of directors, a clear message of importance is being signaled. The absence of such an individual on the board sends a message of its own.

> *Hypothesis 4: The proportion of inside directors representing internal corporate venturing on the board will be positively associated with board-level strategic entrepreneurial attention.*

Small, fast-growing companies have built-in discontinuities. As every entrepreneur and venture capitalist knows, start-ups move through stages of growth, each with its own characteristics and challenges. The boards of some large corporations are looking for directors who are CEO's of high-growth companies precisely for their experience in dealing with rapid change (Charan, 1998). Some small entrepreneurial companies are having success in attracting Fortune 100 CEOs to their boards because of the tremendous opportunity for learning (Charan, 1998). The benefit of crossing over between big and small companies is becoming more widely recognized, thus creating exciting opportunities for companies of all types and sizes. Other reasons the CEOs of large companies may want to serve on such boards may be the potential from stock options, psychic income or intellectual stimulation, and/or learning.

Regardless of director's reasons (for the purposes of the following hypotheses), it is proposed that the phenomena of interlocking decision-makers will increase the strategic entrepreneurial attention of the board and the strategic entrepreneurial actions of the firm. Additionally, I posit that this change in the board's focus of attention will become more strategically entrepreneurial with the breadth of knowledge that each member integrates into the board room. Weick (1995) states that newcomers pay attention to what is happening and notice circumstances because they know those circumstances more fully. In this statement, Weick is referring to the organization as an entire system and a new employee that joins the firm. However, the same principle should apply to the board of directors.

Hypotheses 2a-2c examines the first step of the hypothesized board-level breadth of knowledge mediating relationship between a firm's environmental context and board-level strategic entrepreneurial attention, specifically testing the association between a firm's environmental context and its board's breadth of knowledge (see Figure 1). Here, hypotheses 5a-5d explore the second step of this mediating relationship by testing the association between a firm's environmental context and board-level breadth of knowledge. Again, through the lens of the attention based model, theory suggests that a board with a broader knowledge base and from a relatively more entrepreneurial environment is more likely to allocate more attention to strategic entrepreneurship. Following this reasoning, we can expect that as directors from more entrepreneurial contexts join the board and/or as directors from less entrepreneurial contexts leave, board-level attention will be increasingly allocated to strategically entrepreneurial issues.

Hypothesis 5a: Aggregate Board-level breadth of knowledge will be positively associated with board-level strategic entrepreneurial attention.

Hypothesis 5b: The proportion of outside directors who come) from one or more smaller firms within the same industry will be positively associated with board-level strategic entrepreneurial attention in the larger firm.

Hypothesis 5c: The proportion of inter-industry directors who come from more entrepreneurial industries will be positively associated with board-level strategic entrepreneurial attention.

Hypothesis 5d: The proportion of directors who come from a general science positions will be positively associated with board-level strategic entrepreneurial attention.

The next logical hypothesis, as suggested by the attention based model, attempts to build on earlier hypotheses by extending board-level strategic entrepreneurial attention to firm-level strategic entrepreneurial actions. Up to this hypothesis, the attention based model assumes that allocation of valuable and limited board attention will lead to a proportional allocation of other resources. Directors' scarce resource is their time and attention. They must utilize this time by only addressing the issues deemed to be the most important. If boards, or any other strategic decision makers, consistently allocate a large proportion of their attention to issues that never receive any firm resource allocation, then their value-added to the firm should be questioned. Thus, it is posited that the more attention the board allocates to strategic entrepreneurial decision-making, the greater the likelihood that the firm's management will pursue strategic entrepreneurial actions.

Hypothesis 6: The level of board attention allocated to strategic entrepreneurship will be positively associated with firm-level strategic entrepreneurial actions.

Issues and Answers

Issues and answers are the cultural and cognitive repertoire of schemas available to decision-makers in the firm to make sense of (issues), and to respond to (answers) environmental stimuli. The issues confronted by the firm constitute the cognitive categories of problems, opportunities, and threats that make up the agenda of the firm. These are available to organizational decision-makers to respond to or ignore (Dutton & Jackson, 1987; Jackson & Dutton, 1988; Ocasio, 1997).

As noted above, directors (inside and outside) possess schemas derived from the experiences associated with prior issues and answers that they bring to the board room. These schemas help to make sense of the current perceived firm environment. A cumulative set of issues and answers are present at board meetings. In addition, the board must have the proper situation in which they can focus their attention on the most important issues and answers. Therefore, a hierarchy of issues and answers tends to develop.

Corporate entrepreneurship and innovation strategies are financially demanding and risk intensive. Thus, the management-board relationship must be strong. It is posited that board of firms with recent governance concerns will focus their attention more monitoring and less on entrepreneurial activity. In the face of governance problems, the board must shift from a strategic coaching role toward a more fiduciary at-risk role on behalf of the shareholders. Presumably, the stakeholders of the organization deserve to

see a unified leadership of top management and the board, particularly in organizations undergoing significant change or challenges. Nevertheless, when governance or agency problems have occurred (or were perceived to have occurred), directors with a perceived competency in monitoring and control will eventually be sought to make up the board.

Hypotheses: Issues and Answers. Figure 1 depicts the occurrence of a moderating mediator when a governance concern is present or is perceived to be present. This suggests that, despite the environmental context and the mediating attention structures of the board and the firm, a moderating issue such as a governance problem usurps attentional allocation. So why do governance issues take precedence in board attention over strategic entrepreneurship? The answer to this issue lies in need versus want and confidence of other stakeholders. While you may want something, like organizational growth, a need, such as stopping illegal transfers of company assets, must be addressed first to give an organization's stakeholders a sense of confidence in the organization's decision makers. What good does it do for a firm to grow and gain assets on one hand, but be losing assets on the other?

Based on the attention based model, when an agency problem arises, it is posited that a board with existing competency in strategic council and/or resource dependence will revert to the most basic role of the board – overseeing management.

> *Hypothesis 7: The presence of a governance issue will negatively moderate the relationship between board of director 'breadth of knowledge' and board-level strategic entrepreneurial attention.*

Procedural and Communication Channels

Procedural and communication channels are the formal and informal concrete activities, interactions, and sentiments that induce organizational decision-makers to action on a selected set of issues (Ocasio, 1997). These channels create the situational contexts in which decision-makers allocate and focus their collective and individual attentions. These channels serve as conduits for the processing of issues and answers in the making of organizational moves.

The context in which the board works is crucial in determining the potential for director contribution to value-creation. For example, if management formally presents important issues to the board in a way that does not allow for candid director reactions, directors will have sparse opportunity to contribute. Even when they are uncomfortable with management's decisions or are concerned about the company's performance, they may tend not to assert themselves. Board members may not want to be singled out as an annoying questioner or as a person who initiates resistance to management's plans (Charan, 1998).

Stinchcombe (1968) identifies three dimensions – *spatial, temporal, and procedural* – that shape how these organizational contexts focus the attention of organizational decision-makers. *Spatial dimensions* regulate the availability of issues and answers and their commonality among decision-makers. *Temporal dimensions* regulate the amount of time organizational decision-makers have available to respond (i.e., the duration of interaction and communications between decision-makers and the deadlines for response). *Procedural dimensions* regulate the pattern and duration of

attention to specific issues and answers available for consideration. Together, these three dimensions shape the availability and saliency (Tversky & Kahneman, 1974) of issues and answers within specific channels (Ocasio, 1997).

For boards of directors, board meetings and communications among directors and between directors and non director management create spatial, temporal and procedural dimensions that structure the attention of the board. The spatial dimensions of concern for the board include the meetings location and the physical presence of directors. The temporal dimensions concerns the number of board meetings, the time of the meetings, and the duration of the meetings. The procedural dimensions include the agenda for the meeting, who sets the agenda, order of agenda, how often the agenda is deviated from, etc…

Hypotheses: Procedural and Communication Channels. The subsequent hypotheses derive from these three dimensions to explain a portion of the board of director's 'black box'. How do these factors affect the allocation of board attention amongst the board's various roles (issues in Figure 1)? An attention based model suggests that most traditional procedures and communication channels are unlikely to encourage entrepreneurial or innovative ideas and discussion. Rather, it is more likely that the routine in which policy and procedures are implemented stifle new ideas and discussions. Surely, these same principles are applicable to boards of directors and their situational contexts, which are partially created by the spatial, temporal and procedural dimensions of the board room environment. Below, each of these dimensions is briefly discussed and hypotheses are presented.

First, the spatial dimension may seem to be a simplistic concept. Can the issues discussed by a board really be substantially affected by their physical environment? The following hypothesis posits just such a relationship. Individuals' situational contexts frame their thinking and attention allocation. Since entrepreneurial ideas are by definition not routine, the typical environment of board meetings is less likely to inspire many entrepreneurial epiphanies. The following hypotheses are posited:

> *Hypothesis 8a: The proportion of board meetings located away from the corporate headquarters will be positively associated with board-level strategic entrepreneurial attention. (Spatial dimension)*

Second, the temporal dimension can be applied to board of director meetings by considering both the duration of meetings and the frequency of meetings. Entrepreneurial issues may be seen as "if we have time" topics for many boards. Since boards have a hierarchy of issues to which they need to allocate their attention, entrepreneurial strategies and ideas may be delayed or even dropped. Therefore, the more frequent the board meets and the longer the board meeting duration, the stronger the likelihood of entrepreneurial issues gaining the boards attention.

> *Hypothesis 8b: Board meeting frequency and duration will be positively associated with board-level strategic entrepreneurial attention. (Temporal dimension)*

Third, the procedures dimension attempts to structure the board's attention allocation during a board meeting through the official board meeting agenda. From an attention based model perspective, the more detailed the time allocation of board meeting, the less chance of discussing entrepreneurial issues if they are not already on the agenda. Board agendas vary considerably in their detailed nature. Some agendas are

pages of detailed topics and sub-topics. Other agendas are merely a few guiding items and provide for more open discussion of issues. Examining this through the lens of the attention based model, the following relationship is hypothesized:

> *Hypothesis 8c: Detail of board agenda (control of temporal dimension) will be negatively associated with board-level strategic entrepreneurial attention. (Procedural dimension)*

Summary

An attention-based model cannot explain, by itself, the sources of the firm's competitive advantage. However, combined with other theories (such as agency and resource dependence theories), the attention-based model may serve as an overarching conceptualization of how boards act in different contexts. In an attention-based model of the firm, decision-makers attend to the environment of action and the inputs of decision-making. Through their attentional processing, decision-makers selectively construct the mental models that result in organizational moves, which are the output of decision-making. For the board, the focus of attention is conditional on whether, when, and how members participate in the boards procedural and communication channels. Participation is, in turn, conditional on the time, energy, and effort of decision-makers, and on the attentional demands on their time from other channels. Consistent with Ocasio's (1997) attention based model, directors may provide knowledge of alternative issues and answers, as well as interests and identities that shape which issues and answers become salient. Who participates in a decision process shapes which issues and answers are attended to; and consequently, what decision-makers do (March & Olsen, 1976; Ocasio, 1997).

CHAPTER V

METHODOLOGY

This chapter provides a description of the methodology used to test the hypotheses developed in Chapter IV. Accordingly, the following is organized into three sections: (1) sample selection and research methods; (2) measurement of primary variables; and (3) overview of the statistical methods.

Sample and Research Methods

The sample used in this study was chosen based on the set of opportunities in a given industry per Klevorick, Levin, Nelson and Winter (1995). These authors used data from the Yale Survey on Industrial Research and Development to measure the strength of various sources of technological opportunity and to discern inter-industry differences in the importance of these sources. Building on the differences identified in Klevorick et al. (1995), three industries were chosen with disparate contexts of opportunity from 1994 through 2000. The first industry of interest is the rubber and plastics industry, 3000 – 3099 in the Standard Industrial Classification (SIC) code list. The firms in this industry, of which there are 224 publicly traded firms, are in a context of low opportunity (Klevorick et al., 1995). The second industry of interest is the furniture manufacturing industry, 2500 – 2599 SIC. The firms in this industry, of which there are 115 publicly traded firms, are in a moderate opportunity context per Klevorick et al. (1995). The final industry selected is the electronics industry, 3600 – 3699 SIC. The 748 firms in the

electronics industry are characterized by Klevorick et al. (1995) as being in a high opportunity environment.

Only publicly traded firms are used because of two Securities and Exchange Commission (SEC) reporting requirements: (1) information on board of director characteristics are typically readily available only for public firms, and (2) board minutes are required and are commonly of higher quality for firms accountable to the SEC. There are no parameters regarding size of firm, only that the firm be public. Firm size is of general importance whenever studying entrepreneurial efforts in existing firms and of particular importance in this study's hypotheses 3 and 5a. In all other analyses, Firm size will be controlled for in all other analyses.

After identifying the industries of interest, a list was obtained of all publicly traded firms reporting to the SEC for fiscal year ends 1994 through 2000 from the SEC's *Edgar* database. This database includes public companies that trade stock on the New York Stock Exchange, American Stock Exchange, NASDAQ, and over-the-counter markets. Next, there was an exploration of the possibility of examining a random sample of these firms' board minutes from 1994 – 2000 by calling firms. There was great reluctance from firms in allowing their board minutes outside their firm boundaries. As a result, I requested that their respective certified public accountants, who already have copies of board minutes in permanent audit files, code board minutes regarding opportunity identification and evaluation for this study. Of the firms contacted, 392 agreed that their auditing firms could perform this role.

For each of these 392 firms, director data were obtained through publicly available corporate filings for fiscal years 1994 through 2000. Firm size, age, and research and development expenses were obtained from COMPUSTAT. This database was developed by Standard & Poors and is made up of over 10,000 active and 11,000 inactive U.S. companies. The data set includes financial ratios, growth rates, profitability, and relative market performance.

As detailed further below, many of the firm's board minutes were crude in detail and, thus, not useful for the purposes of this study's research questions and hypotheses. Also, many of the companies experienced events; such as mergers, delisting, failure to file with SEC, bankruptcy, etc…; which affected their continuity of reporting over the study's time frame. These companies were dropped from the study.

The final data consists of the following for all years between and including 1994-2000: plastic and rubber industry – 50 firms and 350 firm/year observations; furniture industry – 45 firms and 315 firm/year observations; electronics industry – 115 firms and 805 firm/ year observations. The final data set is complied from 8162 director/year observations.

Measurement of Variables

The present study is primarily concerned with two levels of board interaction relating to strategic entrepreneurship: (1) how individual board members can affect the attention of the entire board, and (2) how the board can affect the attention and resource allocation of the firm. Further, there is an interest in understanding how the attention of the board and the firm exist in various contexts – both external to the board room and in

the board room. Accordingly, the measures are discussed in three sections: independent variables, dependent variables and control variables.

Independent Variables. The first set of independent variables is firm-level contextual variables. This study utilizes the Dess and Beard (1984) view of environment (dynamism, munificence and complexity). It has been used in prior empirical research to directly test the effect of environmental characteristics on board composition (Boyd, 1990). Data for the environmental factor variables were collected from the Census of Manufacturers, the Dun and Bradstreet's Key Industry Norms Directories, and the Robert Morris Associates Directories.

The second set of independent variables requiring measurement for this study is board-level contextual variables. As noted in Chapter V, the spatial, temporal and procedural dimensions that structure the attention of the board are operationalized as: (1) the meeting location, (2) the physical presence of directors, (3) the number, time and duration of board meetings, and (4) the agenda for the meeting. The spatial (0 = on-site; 1 = off-site) and temporal (meeting length, annual number of meetings) dimension variables are gathered from manual (two independent coders) and automated context analysis of board minutes. Also, the procedural dimension variables are obtained via manual context analysis of board minutes and then comparison of those minutes to board agendas. Some variables that were sought are: who sets the agenda (Chairperson, Chair/CEO, Corporate Secretary, etc…), order of agenda, and how often the board deviates from the agenda and for what purposes. The agendas will also be analyzed by the same CPAs who code that respective company's board minutes. Board meeting

agendas, like board minutes, vary substantially in quality and detail. Board agendas, at a minimum, do typically state the meeting place, who set the agenda, and the procedure and order for the topics of discussion. More detailed agendas allocated the board meeting time to topics and subtopics. In extreme cases, agendas allocated time for discussion per person on each topic.

Mediating Variables. Board-level breadth of knowledge and firm size are hypothesized to have a mediating affect on the relationship between the environmental context and board-level attention allocation. The following categorical coding of board-members is constructed as a combination of Shane's (2000) concept of opportunity recognition based upon an individual's prior knowledge and experience and Klevorick et al.'s (1995) noted opportunity disparity of opportunity between industries. Experience represents the current job and industry of a director at the time of each board meeting. If the directors had been in their current positions less than three years, their work histories are explored for an additional two years. If none of the below codes fit perfectly, the director's five year experiences are averaged preceding that year's meetings. If directors had retired, the experiences from the last five years of their working careers are used. Individual director knowledge (using recent experience as a proxy) perspectives are represented categorically by the following: Creditor/Attorney = 0; Insider – non corporate venturing = 1; Insider - corporate venturing = 2; Outsider – intra industry = 3; Outsider – inter industry = 4; General science = 5.

To gain more detail on the types/roles of insiders who sit on each company's board and potentially affect boardroom attention, three separate coders were to code all

directors for this entire dataset as follows: Outsider = 0; Chief Executive Officer = 1; Executive Vice President = 2; Chief Financial Officer = 3; Chief Operating Officer = 4; Non executive vice president = 5; Other type of insider = 6. All directors coded as 6 or 'other' were explained in detail by the coders in the database but not parsed out further for purposes of this study.

Firm size will be measured as the natural log of each firm's annual gross sales. Firm size will serve as a control variable for all hypotheses except hypothesis three, which sub-divides the data by two-digit SIC to consider firm size within group effects.

For the board meeting hypotheses, site of the meeting was coded as 0 = typical site of meetings (e.g. corporate headquarters) or 1 = off-site. The temporal dimensions were coded as number of meetings per year and how many minutes the board met for during the year. Finally, agenda detail (board agendas are usually prepared by the corporate secretary under the supervision of the chairman of the board) was coded as follows: 1=dense detail; 2=moderate detail; 3=sparse detail; 4=no detail. The above dimensional variables were obtained from the board meeting minutes, board meeting agenda, SEC forms, or all.

Moderating Variable. As hypothesized in Chapter IV, governance problems in the firm may demand most, if not all, the attention of the board. To identify governance issues, automated content analysis was initially used to review each industry's key trade journals, as well as three general business publications - *Wall Street Journal, Business Week,* and *Fortune.* Appendix B lists the words that were programmed into the automated software. In addition, shareholder proxy proposals for years 1994 through

2000 were reviewed to identify potential governance issues that may gain the attention of the board.

Dependent Variables. To measure board-level strategic entrepreneurial attention, structured content analysis (Jauch, Osborn, & Martin, 1980) of companies' board minutes is used. It is widely used in the social sciences for measuring cognitions. Automated text analysis is based upon the Whorf-Sapir hypothesis that cognitive categories through which individuals attend to the world are embedded in the words they use (Cho & Hambrick, 2003; Sapir, 1944; Whorf, 1956). Words that are frequently used are cognitively central and are presumed to reflect what is most on the user's mind. Words that are used infrequently or not at all are presumed to be cognitively periphery, perhaps even representing uncomfortable or alien concepts (Cho & Hambrick, 2003; Huff, 1990).

Text analysis has been used in numerous organizational studies, primarily drawing from the "letter to shareholders" in publicly-traded companies' annual reports (Abrahamson & Park, 1994; Bowman, 1984; Clapham & Schwenk, 1991). Some studies have directly tested the validity of analyzing the letters, with positive results. Letters to shareholders are carefully scripted documents and, therefore, should be viewed cautiously for meaning. In contrast, board minutes have not been constructed or selectively edited by management and represent a record of discussions. This study is interested in how free flowing this discussion tends to be and what issues are addressed. The usefulness of analyzing organizational communications (e.g. letter to shareholders) has been supported in prior empirical studies; such as competitive aggressiveness,

operationalized as rapid response to a competitor's action (Chen & Hambrick, 1995; Chen & Macmillan, 1992; Chen & Miller, 1994); and total number of actions (Young, Smith, & Grimm, 1996).

For this study, approximately 250 accountants reviewed and coded board minutes. Each set of minutes had two reviewers. Additionally, upon receipt of the last coding for a set of minutes, one of the two reviewers for the common set of minutes was sent automated text analysis software. This software was preprogrammed with "indicator" words – "entrepreneurial", "innovate", "expansion", "growth", etc…. Appendix A is a complete list of the words used to verify that all items of interest were identified by the two reviewers. If an item was found that had been excluded by one or both the reviews, each reviewer reexamined the previously excluded item. Attention paid to the strategic entrepreneurial indicators was used to measure strategic management attention.

In addition to identifying the occurrence of strategic entrepreneurship issues in board discussions, reviewers recorded how much of the board meeting was allocated to discussing specific issues (strategic entrepreneurship, governance, financing, etc…). The time spent as a proportion of total board time was coded as board-level strategic entrepreneurial attention. Approximately two-thirds of the board minutes document the board meeting time in a very detailed manner (usually dictated minutes). The remaining minutes were less detailed in who said what and how long each topic was discussed. Firms with less detailed minutes were dropped for the purposes of this dissertation. Therefore, coders examined the amount of text for each topic and estimated how much

of the entire meeting was spent on it. The subjective coder estimation presents a limitation on the value of these minutes. To control for this issue, less detailed minutes went through the regular process of dual coding and, in addition, were reviewed by a third coder when differences between coders of more than ten percent of the entire board meeting time were encountered.

Prior to examining the board minutes of this study's sample, coders were trained on how to code through the use of board minutes from non sample companies. Inter-rater reliability (Cohen's kappa) for the coders was .78. After additional discussions and further training of coders (by identifying key terms and how to code each term), they coded a second set of minutes. This resulted in an improved inter-rater reliability of .89. Coders were instructed to identify key topics and code how long each director commented on: (1) strategic entrepreneurship issues, (2) who supported and opposed related ideas, (3) how much time in the meeting was spent on strategic entrepreneurship issues, (4) did the topic resonate at subsequent meetings, and (5) did the discussion result in firm-level resource allocation (if so, what type)?

Firm-level strategic entrepreneurial actions serve as final dependant variable. Organizational attributes, such as entrepreneurial strategy-making processes or characteristics of the management team, may only facilitate (or impede) entrepreneurial activity. They do not make an organization entrepreneurial (Lyon, Lumpkin, & Dess, 2000). Similarly, the mere intentions of the board are of little value without subsequent firm actions or behaviors that support the creation of related strategies, structures and other organizational phenomena. Therefore, the measurement of these organizational

actions and behaviors is important to the question of whether boards matter and make a strategic difference to a firm.

Trade journals are among the communication and procedural channels through which industry attention is structured. They provide analyses of events and issues as well as perspectives to the readers on their relative importance (Hoffman & Ocasio, 2001). Research on the impact of trade journals shows that their structural position provides a shared reference for knowledge transfer among industry constituents (Nederhof & Meijer, 1995). This makes them a channel of communication in the early stages of industry-related strategy process (Hollifield, 1997) and a common reservoir for available information and interpretations. As such, trade journals play multiple roles in attentional processes. First, they act as a common source of information, creating a historical record relevant to their readership based on both insiders' and outsiders' interpretations this information. Second, they act as an internal constituent of an industry, suggesting which events and issues to attend to and offering analysis and interpretation of their criticality. Third, they act as conduits to other communication channels and public arenas, such as political bodies and the general public. Trade journals actively scan other public media for their coverage of industry issues and events. They often record outsiders' accounts of industry activities and industry reputation, thereby serving as linkages between outsiders' and insiders' public attention (Hoffman & Ocasio, 2001).

As the source for strategic entrepreneurship action data, automated structured content analysis is used to review firm-level strategic entrepreneurship actions or behaviors as documented through trade journals in the rubber and plastics industry, the

furniture manufacturing industry and the electronics industry. Similar indicator words are used in the analysis of board minutes. These journals were reviewed from 1994 through 2002. This nine year time period should encompass any firm-level strategic entrepreneurial actions that result from board meetings quickly, as well as any that have up to a two year lag effect (for review of minutes for years 1999 and 2000).

In addition to the content analysis of firm trade journals, the allocation of internal resources, as evident from board minutes, were analyzed. These allocations of resources often take the form of hiring an outside consultant or assigning the exploration of an opportunity to a board sub-committee. This sub-committee then reports back to the board. This study will investigate the intersection of the committee and the board. However, more detail on committee meetings was unavailable. Nevertheless, the allocation of limited resources, be it financial capital or human capital, inherently indicates priority of an issue.

Control Variables. Board size is calculated as the total number of directors on the board. The literature on group size suggests that larger groups are difficult to manage (Gladstein, 1984), have difficulty reaching consensus due to diversity, experience increased conflict (Oreilly, Caldwell, & Barnett, 1989), and have limited information-processing abilities (Haleblian & Finkelstein, 1993). The effect of board size on board participation in prior research is mixed. Some scholars suggest that board participation is negatively associated board size on topical depth but positively associated with board size on topical breadth (Finkelstein & Hambrick, 1996).

Evidence from prior research concerning the effect of firm age on board decision making is unclear (Finkelstein & Hambrick, 1996). Organization age is the number of years between its founding and the present. Researchers (Lynall et al., 2003; Zald, 1967) have suggested that boards of newer firms may take a more active role. The only empirical test of this perspective found a positive relationship between organization age and board participation in strategic decision making (Judge & Zeithaml, 1992). However, Judge and Zeithaml (1992) findings came from their study of hospital boards, which may be very different than boards of other firms. Therefore, generalizability is questionable. In this study, the age of a firm is measured by years since founding, as reported in *Who Owns Whom – Directory of Corporate Affiliations.*

Board's Relative Power is another control variable that prior literature notes as important. This concept is controlled for through the following two variables. (1) Board relative tenure, which is calculated by taking the average of the sum of each director's board tenure then dividing the sum by the CEO's tenure. (2) Percentage of outsider director stock ownership, which is calculated as the number of shares owned by outsiders divided by the total number of outstanding shares.

Overview of Statistical Methods

As illustrated in Figure 1, as well as the hypotheses, this study explores two distinct dependent variables. These variables are distinct theoretically and by empirical measure. Most of the hypotheses suggest directional cause and effect relationships from environmental and board meeting contexts toward board-level entrepreneurial attention allocation. Entrepreneurial attention is measured as a percentage of annual board

meeting time spent in discussing potential opportunities for the firm. Therefore, this variable is continuous and lends itself to ordinary least squares (OLS) regression analysis. Regression equations were estimated with and without control variables in an effort to partition the variance explained in board-level entrepreneurial attention allocation that might be attributed to the environmental, organization, and/or board factors and contexts.

In contrast to the entrepreneurial attention dependent variable, the entrepreneurial action variable is measured in count terms. Upon completion of the dataset, it was determined, as expected, that this dependent variable was heavily skewed by many zero observations. Therefore, to accommodate for both the count nature of the data as well as the negative skew of the dataset, I utilized negative binomial regression to estimate the relationships in hypothesis six and the main effects of the environmental context in hypotheses one b, d, and e. As with the earlier analysis, regression equations were estimated with and without control variables in an effort to partition the variance explained in firm-level entrepreneurial actions that might be attributed to the environmental and organizational contexts and board-level entrepreneurial attention allocations. Statistical results are presented in the following chapter.

CHAPTER VI

RESULTS

Exploratory Statistics and Diagnostics

This chapter presents the results of the analyses conducted to test the eight hypotheses proposed in Chapter IV. Descriptive statistics are displayed in Table 1 and bivariate correlations are displayed in Table 2 on pages 112 and 113. A summary table reporting the findings of the hypotheses is presented in Table 3 on page 114. The remaining tables present results of multiple regression analyses, utilized for hypotheses with 'board-level entrepreneurial attention' or director 'breadth of knowledge' as the dependent variable, and negative binomial regression, utilized for hypotheses with 'firm-level entrepreneurial actions' as the dependent variable.

During the initial exploration of the data, regression diagnostics were performed to ensure that the data is in accord with the basic assumptions of the classic linear regression model. There were a variety of expected bivariate correlations between the independent variables, as presented in the correlation table. A further examination of the data revealed some outlying data points that appeared to have a potentially influential effect on the analysis. Upon additional analyses in which I excluded the points, they did not have a material effect on the analysis, even the outliers in aggregate. Consequently, these observations are included in the overall dataset.

TABLE 1
Descriptive Statistics

Variable Name	N	Minimum	Maximum	Mean	Std. Deviation
Environmental Munificence	1470	0.25	1.73	1.05	0.31
Environmental Dynamism	1470	0.31	2.76	0.92	0.52
Environmental Complexity	1470	1.50	17.50	5.29	4.04
BOD Breadth of Knowledge	1470	0.14	3.89	2.17	0.79
Corporate Ventureing Insider %	1470	0.00	0.20	0.00	0.02
Intra-Industry Director %	1470	0.00	0.83	0.22	0.19
Inter-Industry Director %	1470	0.00	0.91	0.26	0.23
Gen. Science Director %	1470	0.00	0.40	0.03	0.07
Organizational Size	1470	-4.09	13.90	5.27	2.35
Org. Outstanding Stock	1470	-0.54	4.07	1.83	0.70
Org. Research & Development Exp.	1470	0.00	1.12	0.52	0.45
Relative Board Tenure	1470	0.03	23.30	1.40	1.95
Outside Board Ownership	1470	0.00	72.00	34.83	19.69
Organiation Age	1470	4.00	87.00	29.60	24.07
Governance issue	1470	0.00	1.00	0.04	0.18
Number of Board Meeting per Year	1470	3.00	6.00	4.37	0.71
%of Board Meetings Off-Site	1470	0.00	1.00	0.05	0.09
Meeting Time per Year	1470	385.00	2200.00	1252.50	431.65
Agenda Detail	1470	1.00	4.00	2.36	1.24
Board-Level Entrepreneurial Attention %	1470	-6.36	-1.09	-2.66	0.66
Firm-Level Entrepreneurial Actions	1470	0.00	0.89	0.37	0.34

TABLE 2

Correlations

	Variables	1	2	3	4	5	6	7	8	9	10	11
1	Entrepreneurial Actions											
2	Entrepreneurial Attention	0.5835**										
3	Research & Devp. Exp.	0.3690**	0.2468***									
4	Board Size	0.3367	0.2958	0.3815								
5	Outstanding Stock	0.3988	0.3278	0.5235	0.4742							
6	Net Sales	0.4633	0.4359	0.4875	0.6385***	0.6366						
7	Agenda Detail	0.5332**	0.4036**	0.3521	0.3244**	0.3996	0.4347					
8	Meeting Time	0.3906	0.3290	0.3308	0.3329	0.3081	0.4045**	0.6540*				
9	% Off-Site	0.0230*	-0.0604	0.1133*	0.0904	0.1283	0.1264	0.4010	0.3349			
10	# of Board Meetings	0.3874	0.3667	0.2865	0.2930	0.2946	0.3697**	0.5503**	0.8604*	0.3440		
11	Corporate Venture %	-0.0365	-0.0501	0.0170**	-0.0767	-0.1002	-0.0946*	-0.0154	0.0282	-0.0204	0.0166	
12	Breadth of Knowledge	0.4505**	0.3174**	0.3680	0.3329	0.3485	0.4173	0.4399	0.4319	0.1362**	0.3684	-0.0173
13	Outside Dir. Ownership	-0.1394	-0.1159	-0.0452	-0.0551	0.0394	-0.0941	-0.0527***	0.0790**	0.1976	0.1568	0.0093
14	Relative Board Tenure	0.1234	0.0962	0.1750	0.1007	0.0840	0.0804	0.0566	0.0279	-0.0090	0.0328	-0.0271
15	Organization Age	-0.0045	-0.0137**	0.0735	-0.0025	0.0441**	0.0701*	0.0557**	0.0363	0.0310	0.0394	-0.0065***
16	Governance Issue(s)	-0.0814**	-0.0649*	-0.0256**	0.0431**	0.0008	-0.0410	-0.0198	0.0122	0.0662	0.0191	0.0148
17	Environmental Complexity	0.0527	-0.0374	0.0468	-0.0184	0.0215	0.0574	0.1244	0.0977	0.0499	0.0685	-0.0614
18	Environmental Dynamism	0.1524*	0.0882**	0.0732*	-0.0550	0.0300	0.0572	0.1207	0.0747	0.0322**	0.0616*	-0.0244
19	Environmental Munificence	0.1037*	-0.0292	-0.0044	-0.0587	-0.0115	-0.0778	0.1009	0.0965	0.0620**	0.0741***	0.0436
20	Inter-Industry Director %	0.4747*	0.3047	0.3295	0.4152	0.3538	0.4774	0.5463	0.4495	0.1834*	0.3916	-0.0698
21	Intra-Industry Director %	-0.2651	-0.2140	-0.0157	-0.1627	-0.1276	-0.1946	-0.2884	-0.1365	-0.1190	-0.1495	0.0118
22	Gen. Science Director %	0.1780**	0.2151	0.1357*	0.1493	0.2743	0.2131	0.1633	0.1643	0.0333***	0.1671	-0.0280

\+ p<.10 * p<.05 ** p<.01 *** p<.001

TABLE 2 (continued)
Correlations

	Variables	12	13	14	15	16	17	18	19	20	21
1	Entrepreneurial Actions										
2	Entrepreneurial Attention										
3	Research & Devp. Exp.										
4	Board Size										
5	Outstanding Stock										
6	Net Sales										
7	Agenda Detail										
8	Meeting Time										
9	% Off-Site										
10	# of Board Meetings										
11	Corporate Venture %										
12	Breadth of Knowledge										
13	Outside Dir. Ownership	-0.0040									
14	Relative Board Tenure	0.0117	-0.0194								
15	Organization Age	0.0485	0.0035	-0.0700							
16	Governance Issue(s)	-0.0100	0.0177	0.0062	-0.0086						
17	Environmental Complexity	0.0342***	-0.0365	0.0115	-0.1446	-0.0722					
18	Environmental Dynamism	0.1451**	-0.0115	-0.0140**	0.0222	-0.0165	0.1905***				
19	Environmental Munificence	0.0531*	-0.0257	-0.0236**	-0.0256	0.1007	-0.0523	-0.4042			
20	Inter-Industry Director %	0.7540*	-0.0348	0.0370	0.0818	-0.0181**	0.0628	0.1142*	0.0289**		
21	Intra-Industry Director %	0.1270**	0.0964	0.0160	-0.1138	0.0005	-0.0380	-0.0224	0.0261*	-0.4255	
22	Gen. Science Director %	0.3219*	-0.0520	-0.0416	0.0654	-0.0108	-0.0202	0.0436*	-0.0363	0.0226	-0.1166

\+ p<.10 * p<.05 ** p<.01 *** p<.001

TABLE 3
Summary of the Results of Hypotheses Testing

		Results
H1a	The level of environmental dynamism will be positively associated with board-level strategic entrepreneurial attention.	supported
H1b	The level of environmental dynamism will be positively associated with firm-level strategic entrepreneurial actions.	supported
H1c	The level of environmental munificence will be positively associated with board-level of strategic entrepreneurial attention.	supported
H1d	The level of environmental munificence will be positively associated with firm-level strategic entrepreneurial actions.	supported
H1e	The level of environmental complexity will be positively associated with board-level strategic entrepreneurial attention.	not supported
H1f	The level of environmental complexity will be positively associated with firm-level strategic entrepreneurial actions.	not supported
H2a	The level of environmental dynamism will be positively associated with board-level 'breadth of knowledge'.	supported
H2b	The level of environmental munificence will be positively associated with board-level 'breadth of knowledge'.	supported
H2c	The level of environmental complexity will be positively associated with board-level 'breadth of knowledge'.	not supported
H3a	Within an industry, firm size will be negatively associated with board-level strategic entrepreneurial attention.	not supported
H3b	Within an industry, firm size will be negatively associated with firm-level strategic entrepreneurial actions.	not supported
H4	The proportion of inside directors representing internal corporate venturing on the board will be positively associated with board-level strategic entrepreneurial attention.	not supported
H5a	Aggregate Board-level breadth of knowledge will be positively associated with board-level strategic entrepreneurial attention.	supported
H5b	The proportion of outside directors who come) from one or more smaller firms within the same industry will be positively associated with board-level strategic entrepreneurial attention in the larger firm.	not supported
H5c	The proportion of inter-industry directors who come from more entrepreneurial industries will be positively associated with board-level strategic entrepreneurial attention.	supported
H5d	The proportion of directors who come from a general science positions will be positively associated with board-level strategic entrepreneurial attention.	supported
H6	The level of board attention allocated to strategic entrepreneurship will be positively associated with firm-level strategic entrepreneurial actions.	supported
H7	The presence of a governance issue will negatively moderate the relationship between board of director 'breadth of knowledge' and board-level strategic entrepreneurial attention.	supported
H8a	The proportion of board meetings located away from the corporate headquarters will be positively associated with board-level strategic entrepreneurial attention.	not supported
H8b	Board meeting frequency and duration will be positively associated with board-level strategic entrepreneurial attention.	partial support
H8c	Detail of board agenda will be negatively associated with board-level strategic entrepreneurial attention.	supported

The following regression diagnostics were also performed with *Stata 8.2*: heteroskedasticity (Cook and Weisberg's test), normality (skewness and kurtosis tests), and multicollinearity (variance inflation factors and tolerance values). First, based upon the Cook and Weisberg test of heteroskedasticity, it appears that the assumption of homoskedasticity is not violated. Second, the normality of error term doesn't appear to be a problem as the sample size of 1470 firm-year observations is reasonably large. Although the independent variables and dependent variables were not transformed, many of the control variables; such as net sales, outstanding stock, research and development expense, relative board power, and board size; were transformed to approximate normal distributions. Third, upon examination of the multicollinearity tests, some of the control variables had tolerance levels near .40. Therefore, I chose a method of model calculation and presentation in which highly correlated control variables were entered separately to avoid multicollinearity problems.

In addition to the data exploration above, the control and independent variables of those firms that did allow their board minutes and those that did not allow their board minutes to be coded were calculated and analyzed. There were no significant differences noted. The interpreted results and tables for each individual hypothesis are presented in the following sections.

Hypotheses 1a, 1c and 1e

Table 4 presents the findings of an OLS regression equation which considers the potential impact that a firm's industrial context may have on the percentage of time that boards of directors allocate to discussing and evaluating strategic entrepreneurial

opportunities. This corresponds to Hypotheses 1a, 1c and 1e, measuring the industrial context via munificence, dynamism, and complexity. Models 1, 2 and 3 present the control variables for the equation, with highly correlated control variables entered separately to avoid multicollinearity problems. Model 4 adds the industrial environment variables hypothesized to affect the amount of time that boards allocate to strategic entrepreneurial attention. The results in Table 4 suggest that both environmental munificence and environmental dynamism are positively and significantly (both at the .001 alpha level) related to board-level strategic entrepreneurial attention allocation during board meeting. Therefore, hypotheses 1a and 1c are strongly supported. However, hypothesis 1e, which posits that environmental complexity will also be positively and significantly related to board-level strategic entrepreneurial attention allocation, was found to be positive but not significant. Hence, hypothesis 1e was not supported.

TABLE 4
Environmental Context and Entrepreneurial Attention
Results of OLS Regression Models
(Testing Hypotheses 1a, 1c & 1e)

Variable	Board-Level Entrepreneurial Attention							
	Model 1		**Model 2**		**Model 3**		**Model 4**	
Intercept	-.0300***	(.0044)	-.0281***	(.0047)	-.0422***	(.0090)	-.1098***	(.0121)
Firm Size	.0079***	(.0008)	.0079***	(.0008)	.0071***	(.0010)	.0070***	(.0010)
Firm Outstanding Stock	.0103***	(.0029)	.0103***	(.0029)	.0100***	(.0030)	.0094***	(.0029)
Firm R&D Expense	.0022***	(.0040)	.0224***	(.0040)	.0202***	(.0041)	.0172***	(.0038)
Firm Age			-.0007	(.0001)	-.0005	(.0001)	-00003	(.0000)
Relative Board Tenure					.0020**	(.0008)	.0023**	(.0008)
Outside Director Ownership					-.00002	(.0001)	.0001	(.0001)
Board size					.0076+	(.0044)	.0124*	(.0121)
Environment Munificence							.0355***	(.0051)
Environment Dynamism							.0192***	(.0031)
Environment Complexity							.0006	(.0004)
F-Value	139.51***		105.00***		61.79***		51.78***	
Model R-square	.2221		.2228		.2283		.2620	
Adjusted R-Square	.2205		.2207		.2283		.2569	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.
+ p<.10 * p<.05 ** p<.01 *** p<.001

Hypotheses 1b, 1d and 1f

Table 5 presents the findings of a negative binomial regression equation which considers the potential impact that a firm's industrial context may have on the number of strategic entrepreneurial actions in which a firm engages. This corresponds to Hypotheses 1b, 1d and 1f, again measuring the industrial context via munificence, dynamism, and complexity. Models 1, 2 and 3 present the control variables for the equation, with highly correlated control variables entered separately to avoid multicollinearity problems. Model 4 adds the industrial environment variables hypothesized to affect the number of firm-level strategic entrepreneurial actions. The results in Table 5 suggest that both environmental munificence and environmental dynamism are positively and significantly (both at the .001 alpha level) related to firm-level strategic entrepreneurial actions. Therefore, hypotheses 1b and 1d are both strongly supported. However, hypothesis 1f, which posits that environmental complexity will be positively and significantly related to firm-level strategic entrepreneurial actions, was found to be positive but not significant. Hence, hypothesis 1f was not supported.

TABLE 5
Environmental Context and Entrepreneurial Actions
Results of Negative Binomial Regression Models
(Testing Hypotheses 1b, 1d & 1f)

Variable	Firm-Level Entrepreneurial Actions							
	Model 1		Model 2		Model 3		Model 4	
Intercept	-1.9580***	(.1343)	-1.8790***	(.1486)	-1.8620***	(.2581)	-3.0958***	(.3402)
Firm Size	.2569***	(.0265)	.2584***	(.0265)	.2420***	(.0304)	.2342***	(.0300)
Firm Outstanding Stock	.1304	(.0878)	.1179	(.0882)	.1400	(.0884)	.1484+	(.0873)
Firm R&D Expense	.6812***	(.6812)	.6845***	(.1105)	.6108***	(.1124)	.5372***	(.1123)
Firm Age			-.0023	(.0018)	-.0018	(.0018)	-.0021	(.0018)
Relative Board Tenure					.0427*	(.0203)	.0506**	(.0200)
Outside Director Ownership					-.0060**	(.0021)	-.0051*	(.0021)
Board size					.0835	(.2581)	.1453	(.1250)
Environment Munificence							.7427***	(.1453)
Environment Dynamism							.4294***	(.0910)
Environment Complexity							-.0144	(.0105)
Alpha	1.5240	(.1124)	1.5128	(.1124)	1.4729	(.1106)	1.3703	(.1062)
LR chi2	392.54***		394.03***		407.25***		443.36***	
Log likelihood	-2111.0422		-2110.2979		-2103.6879		-2085.6360	
Pseudo R-square	.0851		.0854		.0883		.0961	
Change in Pseudo R-Square			.0003		.0029		.0078	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.
+ p<.10 * p<.05 ** p<.01 *** p<.001

Hypotheses 2a, 2b and 2c

Table 6 presents the findings of an OLS regression equation with board-level breadth of knowledge (the average of all the directors' recent experiences relative to the firm's current contextual situation) as the dependent variable. This corresponds to Hypotheses 2a, 2b and 2c, which test the effects of the industrial environment (munificence, dynamism and complexity) on board-level strategic entrepreneurial attention. Models 1, 2 and 3 present the control variables for the equation, with highly correlated control variables entered separately to avoid multicollinearity problems. Model 4 adds in the environmental context variables of environmental munificence, environmental dynamism and environmental complexity. The results in Table 6 suggest that both environmental munificence and environmental dynamism are positively and significantly (both at the .001 alpha level) related to the board breadth of knowledge construct. Therefore, hypotheses 2a and 2b are both strongly supported. However, hypothesis 2c, which posits that environmental complexity is positively and significantly related to board breadth of knowledge, was found to be positive but not significant. Hence, hypothesis 2c was not supported.

TABLE 6
Environmental Context and Attention Structures
Results of OLS Regression Models
(Testing Hypotheses 2a, 2b & 2c)

Variable	Board-Level Breadth of Knowledge							
	Model 1		**Model 2**		**Model 3**		**Model 4**	
Intercept	1.3564***	(.0540)	1.3463***	(.0576)	1.0794***	(.1109)	.3057*	(.1495)
Firm Size	.0933***	(.0104)	.0933***	(.0104)	.0790***	(.0119)	.0772***	(.0117)
Firm Outstanding Stock	.0783*	(.0361)	.0786*	(.0361)	.0630+	(.0364)	.0561	(.0357)
Firm R&D Expense	.3469***	(.0494)	.3457***	(.0495)	.3555***	(.0500)	.3192***	(.0492)
Firm Age			.0003	(.0007)	.0004	(.0008)	.0004	(.0007)
Relative Board Tenure					-.0222*	(.0096)	-.0190*	(.0094)
Outside Director Ownership					.0012	(.0009)	.0014	(.0009)
Board size					.1553**	(.0542)	.2140***	(.0537)
Environment Munificence							.3937***	(.0634)
Environment Dynamism							.2873***	(.0389)
Environment Complexity							-.0020	(.0046)
F-Value	131.63***		98.73***		58.94***		49.78***	
Model R-square	.2122		.2123		.2201		.2544	
Adjusted R- squared	.2106		.2102		.2164		.2493	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.

\+ p<.10 * p<.05 ** p<.01 *** p<.001

Hypothesis 3a

Table 7 presents the findings of an OLS regression equation with board-level strategic entrepreneurial attention as the dependent variable and firm size, categorized by two-digit SIC codes for each of the three industries, as the independent variable of interest. This equation corresponds to Hypothesis 3a, testing the effects of intra-industrial relative firm size on boards' strategic entrepreneurial attention percentage. Models 1, 2 and 3 present the control variables for each industry's equation, with highly correlated control variables entered separately to avoid multicollinearity problems. Model 4 adds in firm size. The results in Table 7 suggest that firm size does have a significant relationship with board-level strategic entrepreneurial attention within each of the three industries. Although Hypothesis 3a posits a negative relationship between firm size and board-level strategic entrepreneurial attention, the results suggest a positive and significant relationship. Therefore, Hypothesis 3a is not supported.

Hypothesis 3b

Table 8 presents the findings of a negative binomial regression equation with firm-level strategic entrepreneurial actions as the dependent variable and firm size (consistent with Hypothesis 3a, the sample firms are separated by their two-digit SIC codes) as the independent variable. The control variables and independent variable were entered in the same sequence as they were in Hypothesis 3a and led to similar results. The results in Table 8 suggest that intra-industry firm size and firm-level strategic entrepreneurial actions are significantly related, but positively rather than negatively as hypothesized. Consequently, Hypothesis 3b is not supported.

TABLE 7
Intra-Industry Firm Size and Board-Level Entrepreneurial Attention
Results of OLS Regression Models
(Testing Hypothesis 3a)

	Board-Level Entrepreneurial Attention											
	Furniture Industry				**Plastic & Rubber Industry**				**Electronics Industry**			
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-.0076 (.0077)	-.0012 (.0083)	-.0183 (.0159)	-.0047 (.0152)	-.0379*** (.0052)	-.0720*** (.0100)	-.1176*** (.0202)	-.0991*** (.0201)	-.0172** (.0061)	-.0125* (.0064)	-.0614*** (.0126)	-.0466*** (.0127)
Firm Outstanding Stock	.0151*** (.0047)	.0154*** (.0047)	.0115+ (.0054)	-.0130+ (.0066)	.0445*** (.0052)	.0503*** (.0051)	.0448*** (.0053)	.0375*** (.0054)	.0200*** (.0036)	-0207*** (.0036)	.0171*** (.0037)	.0079* (.0040)
Firm R&D Expense	.0277*** (.0078)	.0262*** (.0078)	.0209** (.0081)	.0137+ (.0078)	.0249*** (.0078)	.0249*** (.0074)	.0190** (.0076)	.0084 (.0077)	.0368*** (0060)	.0386*** (.0060)	.0247*** (.0063)	.0203*** (.0062)
Firm Age		-.0002* (.0001)	-.0003* (.0001)	-.0002 (.0001)		.0008*** (.0001)	.0008*** (.0001)	.0007*** (.0001)		-.0002 ** (.0001)	-.0002+ (.0001)	-.0002** (.00008)
Relative Board Tenure			.0021+ (.0012)	.0020+ (.0012)			-.0012 (.0018)	-.0012 (.0017)			.0042*** (.0011)	.0044*** (.0011)
Outside Director Ownership			-.00001 (.0001)	-.0001 (.0001)			-.0002 (.0001)	-.0001 (.0001)			-.0001 (.0001)	.00003 (.0001)
Board size			.0100 (.0076)	-.0136+ (.0082)			.0275** (.0088)	.0110 (.0093)			.0268*** (.0057)	.0119* (.0063)
Firm Size				.0156*** (.0026)				.0073*** (.0016)				.0070*** (.0013)
F-Value	26.85***	19.49***	10.57***	15.11***	73.32***	65.94***	35.60***	35.10	71.99***	50.78***	32.80***	32.96***
Model R-square	.1468	.1583	.1708	.2562	.2971	.3638	.3837	.4181	.1522	.1598	.1978	.2245
Adjusted R-squared	.1414	.1502	.1546	.2393	.2930	.3583	.3730	.4062	.1501	.1566	.1918	.2177

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses. **+ p<.10 * p<.05 ** p<.01 *** p<.001**

TABLE 8

Intra-Industry Firm Size and Firm-Level Entrepreneurial Actions

Results of Negative Binomial Regression Models

(Testing Hypothesis 3b)

	Firm-Level Entrepreneurial Actions											
	Furniture Industry				**Plastic & Rubber Industry**				**Electronics Industry**			
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-1.2966*** (.3308)	-1.2547*** (.3497)	-1.9097** (.6407)	-1.9691** (.6288)	-1.4671*** (.2102)	-2.4069*** (.3000)	-4.1327*** (.5801)	-3.5238*** (.5226)	-1.6815*** (.1881)	-1.4806*** (.1959)	-2.1486*** (.3416)	-1.7294*** (.3526)
Firm Outstanding Stock	.3295+ (.1983)	.3341+ (1985)	.1241 (.2522)	-.5864+ (.3225)	.7993*** (.1133)	1.0085*** (.1225)	.8535*** (.1259)	.4137*** (.1277)	.5558*** (.1046)	.5511*** (.1041)	.8907*** (.1741)	.1445 (.1249)
Firm R&D Expense	1.0220*** (.2926)	1.0093*** (.2947)	.9238** (.3005)	.7106* (.2957)	.9026*** (.1775)	.9267*** (.1756)	.6459*** (.1805)	-.1057 (.1927)	1.1245*** (.1666)	1.1896*** (.1671)	.8907*** (.1741)	.7864*** (.1732)
Firm Age		-.0018 (.0049)	-.0015 (.0049)	.0032 (.0049)		.0168*** (.0038)	.0146*** (.0038)	.0115*** (.0033)		-.0082*** (.0024)	-.0076** (0024)	-.0085*** (.0024)
Relative Board Tenure			.0146 (.0317)	.0191 (.0303)			.0373 (.0509)	.0211 (.0429)			.0735* (.0289)	.0693* (.0286)
Outside Director Ownership			.0008 (.0058)	.0002 (0055)			-.0089** (.0035)	-.0096** (.0031)			-.0085** (.0030)	-.0063* (.0030)
Board size			.4160 (.3189)	-.0443 (.3364)			.9921*** (.2384)	.3602 (.2271)			.5559*** (.1539)	.1059 (.1777)
Firm Size				.4048*** (.1143)				.3788*** (.0534)				.2112*** (.3526)
Alpha	1.9251 (.3518)	.6537 (.1828)	1.8578 (.3482)	1.6237 (.3202)	1.2232 (.1742)	1.1319 (.1600)	.9869 (.1443)	.5722 (.1101)	1.8189 (.0950)	1.7408 (.1690)	1.5747 (.1593)	1.4910 (.1016)
LR chi2	39.37***	39.50***	41.41***	54.38***	123.54***	143.35***	165.63***	217.72***	143.72***	154.60***	183.38***	210.02***
Log likelihood	-367.4288	-367.3633	-366.4094	-359.9218	-595.6180	-585.7103	-574.5708	-548.5288	-1170.6439	-1165.2039	-1150.8132	-1137.4939
Pseudo R-square	.0508	.0510	.0535	.0702	.0940	.1090	.1260	.1656	.0578	.0622	.0738	.0845
Change in Pseudo R-Square		.0002	.0025	.0167		.0150	.0170	.0396		.0044	.0116	.0107

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses. + p<.10 * p<.05 ** p<.01 *** p<.001

Hypothesis 4

Table 9 on page 127 presents the findings of an OLS regression equation which considers the impact of corporate venturing insider directors, as a percentage of the total board, on board-level strategic entrepreneurial attention. This equation corresponds to Hypothesis 4. Models 1, 2 and 3 present the control variables for the equation, with highly correlated control variables entered separately to avoid multicollinearity problems. Model 4 adds the corporate venturing director percentage hypothesized to affect the amount of time that boards allocate to strategic entrepreneurial attention. The results in Table 9 suggest that the corporate venturing insider percentage is positively related to board-level strategic entrepreneurial attention, but not significantly. Therefore, Hypothesis 4 is not supported.

Hypotheses 5a, 5b, 5c and 5d

Tables 10, 11, 12 and 13 present the results for Hypotheses 5a, 5b, 5c and 5d respectively. The findings for each of these four OLS regressions use board-level strategic entrepreneurial attention as the dependent variable. They were calculated by first entering control variables in Models 1, 2 and 3 and ultimately by entering the specific independent variable of interest in Model 4.

Table 10 on page 128 presents the results for Hypothesis 5a. It posits that aggregate board-level breadth of knowledge will be positively related to board-level allocation toward strategic entrepreneurial attention. The results presented suggest that board-level breadth of knowledge is both positively and significantly (.001) related to

the amount of time boards spend on strategic entrepreneurial attention. Hypothesis 5a is strongly supported.

Table 11 on page 129 presents the results for Hypothesis 5b. It posits that intra-industry director percentage will be positively related to a board's time allocation toward strategic entrepreneurial attention. The results suggest that intra-industry director percentage is significantly (.001) related to the amount of board-level strategic entrepreneurial attention, but negatively. Therefore, Hypothesis 5b is not supported.

Table 12 on page 130 presents the results for Hypothesis 5c. It posits that inter-industry director percentage will be positively related to board-level time allocation toward strategic entrepreneurial attention. The results presented suggest that inter-industry director percentage is both positively and significantly (.001) related to the amount of board-level strategic entrepreneurial attention. Therefore, Hypothesis 5c is strongly support

Table 13 on page 131 presents the results for Hypothesis 5d. It posits that general science director percentage will be positively related to board-level time allocation toward strategic entrepreneurial attention. The results suggest that general science director percentage is both positively and significantly (.001) related to the amount of board-level strategic entrepreneurial attention. Therefore, Hypothesis 5d is strongly supported.

TABLE 9

Corporate Venture Director and Board-Level Entrepreneurial Attention

Results of OLS Regression Models

(Testing Hypothesis 4)

Variable	Board-Level Entrepreneurial Attention							
	Model 1		Model 2		Model 3		Model 4	
Intercept	-.02997***	(.0044)	-.0281***	(.0047)	-.04218***	(.0090)	-.0432***	(.0090)
Firm Size	.0079***	(.0008)	.0079***	(.0008)	.0071***	(.0010)	.0072***	(.0010)
Firm Outstanding Stock	.0103***	(.0029)	.0103***	(.0029)	.0100***	(.0030)	.0103***	(.0030)
Firm R&D Expense	.0022***	(.0040)	.0224***	(.0040)	.0202***	(.0041)	.0198***	(.0041)
Firm Age			-.0007	(.0001)	-.0005	(.0001)	-.0001	(.0001)
Relative Board Tenure					.0020**	(.0008)	.0021**	(.0001)
Outside Director Ownership					-.00002	(.0001)	-.00002	(.0001)
Board size					.0076+	(.0044)	.0078+	(.0044)
Corporate Venture Director							.0894	(0741)
F-Value	139.51***		105.00***		61.79***		54.27***	
Model R-square	.2221		.2228		.2283		.2291	
Change in R-Square			.0007		.0055		.0008	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.

\+ p<.10 * p<.05 ** p<.01 *** p<.001

TABLE 10
Board's Breadth of Knowledge and Board-Level Entreprenurial Attention
Results of OLS Regression Models
(Testing Hypothesis 5a)

Variable	Board-Level Entrepreneurial Attention							
	Model 1		Model 2		Model 3		Model 4	
Intercept	-.02997***	(.0044)	-.0281***	(.0047)	-.04218***	(.0047)	-.0677***	(.0089)
Firm Size	.0079***	(.0008)	.0079***	(.0008)	.0071***	(.0010)	.0052***	(.0009)
Firm Outstanding Stock	.0103***	(.0029)	.0103***	(.0029)	.0100***	(.0030)	.0086**	(.0028)
Firm R&D Expense	.0022***	(.0040)	.0224***	(.0040)	.0202***	(.0041)	.0118**	(.0039)
Firm Age			-.0007	(.0001)	-.0005	(.0001)	-.0001	(.0001)
Relative Board Tenure					.0020**	(.0008)	.0026***	(.0007)
Outside Director Ownership					-.00002	(.0001)	-.0001	(.0001)
Board size					.0076+	(.0044)	.0039	(.0042)
Board of Director Breadth of Knowledge							.0236***	(.0236)
F-Value	139.51***		105.00***		61.79***		76.11***	
Model R-square	.2221		.2228		.2283		.2941	
Change in R-Square			.0007		.0055		.0658	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.
+ p<.10 * p<.05 ** p<.01 *** p<.001

TABLE 11

Intra-Industry Director % and Board-Level Entreprenurial Attention

Results of OLS Regression Models

(Testing Hypothesis 5b)

Variable	Board-Level Entrepreneurial Attention							
	Model 1		Model 2		Model 3		Model 4	
Intercept	-.02997***	(.0044)	-.0281***	(.0047)	-.04218***	(.0090)	-.0180*	(.0092)
Firm Size	.0079***	(.0008)	.0079***	(.0008)	.0071***	(.0010)	.0063***	(.0009)
Firm Outstanding Stock	.0103***	(.0029)	.0103***	(.0029)	.0100***	(.0030)	.0090**	(.0029)
Firm R&D Expense	.0022***	(.0040)	.0224***	(.0040)	.0202***	(.0041)	.0240***	(.0040)
Firm Age			-.0007	(.0001)	-.0005	(.0001)	-.0001+	(.0001)
Relative Board Tenure					.0020**	(.0008)	.0021**	(.0008)
Outside Director Ownership					-.00002	(.0001)	.00003	(.0001)
Board size					.0076+	(.0044)	.0051	(.0043)
Intra-Industry Director Percentage							-.0664***	(.0078)
F-Value	139.51***		105.00***		61.79***		65.89***	
Model R-square	.2221		.2228		.2283		.2651	
Change in R-Square			.0007		.0055		.0368	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.

\+ p<.10 * p<.05 ** p<.01 *** p<.001

TABLE 12

Inter-Industry Director % and Board-Level Entreprenurial Attention

Results of OLS Regression Models

(Testing Hypothesis 5c)

Variable	Board-Level Entrepreneurial Attention							
	Model 1		Model 2		Model 3		Model 4	
Intercept	-.02997***	(.0044)	-.0281***	(.0047)	-.0422***	(.0090)	-0255**	(.0084)
Firm Size	.0079***	(.0008)	.0079***	(.0008)	.0071***	(.0010)	.0041***	(.0010)
Firm Outstanding Stock	.0103***	(.0029)	.0103***	(.0029)	.0100***	(.0030)	.0091***	(.0027)
Firm R&D Expense	.0022***	(.0040)	.0224***	(.0040)	.0202***	(.0041)	.0147***	(.0038)
Firm Age			-.0007	(.0001)	-.0005	(.0001)	-.0001+	(.0001)
Relative Board Tenure					.0020**	(.0008)	.0021**	(.0008)
Outside Director Ownership					-.00002	(.0001)	.0023**	(.0007)
Board size					.0076+	(.0044)	-.0019	(.0041)
Inter-Industry Director Percentage							.1040***	(.0070)
F-Value	139.51***		105.00***		61.79***		89.55***	
Model R-square	.2221		.2228		.2283		.3290	
Change in R-Square			.0007		.0055		.1007	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.

\+ p<.10 * p<.05 ** p<.01 *** p<.001

TABLE 13

General Science Director % and Board-Level Entreprenurial Attention

Results of OLS Regression Models

(Testing Hypothesis 5d)

Variable	Board-Level Entrepreneurial Attention							
	Model 1		Model 2		Model 3		Model 4	
Intercept	-.0300***	(.0044)	-.0281***	(.0047)	-.0422***	(.0090)	-.0408***	(.0089)
Firm Size	.0079***	(.0008)	.0079***	(.0008)	.0071***	(.0010)	.0070***	(.0010)
Firm Outstanding Stock	.0103***	(.0029)	.0103***	(.0029)	.0100***	(.0030)	.0078**	(.0030)
Firm R&D Expense	.0022***	(.0040)	.0224***	(.0040)	.0202***	(.0041)	.0205***	(.0040)
Firm Age			-.0007	(.0001)	-.0005	(.0001)	-.0001	(.0001)
Relative Board Tenure					.0020**	(.0008)	.0022**	(.0008)
Outside Director Ownership					-.00002	(.0001)	-.0001	(.0001)
Board size					.0076+	(.0044)	.0075+	(.0044)
General Science Director Percentage							.0945***	(.0233)
F-Value	139.51***		105.00***		61.79***		56.69***	
Model R-square	.2221		.2228		.2283		.2327	
Change in R-Square			.0007		.0055		.0044	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.

+ p<.10 * p<.05 ** p<.01 *** p<.001

Hypothesis 6

Table 14 on page 134 presents the findings of a negative binomial regression equation with firm-level strategic entrepreneurial actions as the dependent variable and board-level strategic entrepreneurial attention as the independent variable. This table and equation test Hypothesis 6. The control variables and independent variable were entered in the same manner as in previous hypotheses (first, organization control variables; second, organizational age to parse out variance and avoid multicollinearity; third, board control variables; fourth, the independent variable of interest). Table 14 results suggest that board-level strategic entrepreneurial attention and firm-level strategic entrepreneurial actions are positively and significantly (.001 level) related. Consequently, Hypothesis 6 is strongly supported.

Hypothesis 7

Table 15 on page 136 presents the results for the hypothesized moderating impact of governance issues between attention structures (firm size, aggregate breadth of knowledge, and type of director percentage: corporate venturing, intra-industry, inter-industry, or general science) and time spent on board-level strategic entrepreneurial attention.

To test the moderation between the mediator, board breadth of knowledge, and strategic entrepreneurial attention, the moderator variable identification procedure recommended by Sharma, Durand and Gurarie (1981) was implemented. Concisely stated, these authors suggest that tests of moderation should proceed in multiple steps.

First, moderated regression should be used to investigate the significance of the hypothesized moderator variable. If this technique does not reveal a statistically significant relationship, subgroup analysis is prescribed.

Sharma et al. (1981) recommends the utilization of both procedures because each tests different properties of the hypothesized moderation. More specifically, if the interaction term in the moderated regression is significant, the hypothesized moderator impacts the form of the relationship between the independent variable and the dependent variable. Conversely, if subgroup analysis reveals a significant relationship, the hypothesized moderator impacts the strength of the relationship between the independent variable and the dependent variable. Based on Sharma's prescriptions, both techniques were used to investigate the properties of the hypothesized moderator variables.

Table 15 presents the subgroup analysis of this moderating relationship by separating the firm years in which governance issues did occur (n=52) and firm years in which governance issues did not occur (n=1418). The results suggest that board of director breadth of knowledge is positively and significantly (.001 level) related to board-level strategic entrepreneurial attention when no governance issues are present. Table 15 also suggests that board of director breadth of knowledge is positively and significantly related to board-level strategic entrepreneurial attention when governance issues are present. However, this relationship is significant at the .1 level.

TABLE 14

Board-level Entrepreneurial Attention and Firm-Level Entrepreneurial Actions

Results of Negative Binomial Regression Models

(Testing Hypothesis 6)

Variable	Firm-Level Entrepreneurial Actions							
	Model 1		Model 2		Model 3		Model 4	
Intercept	-1.9580***	(.1343)	-1.8790***	(.1486)	-1.8620***	(.2581)	-1.2770***	(.2006)
Firm Size	.2569***	(.0265)	.2584***	(.0265)	.2420***	(.0304)	.0678**	(.0245)
Firm Outstanding Stock	.1304	(.0878)]	.1179	(.0882)	.1400	(.0884)	.0055	(.0700)
Firm R&D Expense	.6812***	(.1107)	.6845***	(.1105)	.6108***	(.1124)	.2600**	(.0914)
Firm Age			-.0023	(.0018)	-.0018	(.0018)	-.0016	(.0014)
Relative Board Tenure					.0427*	(.0203)	-.0043	(.0140)
Outside Director Ownership					-.0060**	(.0021)	-.0070***	(.0016)
Board size					.0835	(.2581)	.0871	(.0983)
Board-Level Entrepreneurial Attetnion							13.2658***	(.5119)
Alpha	1.5240	(.1124)	1.5128	(.1124)	1.4729	(.1106)	.3563	(.0442)
LR chi2	392.54***		394.03***		407.25***		1058.45***	
Log likelihood	-2111.0422		-2110.2979		-2103.6879		-1778.0907	
Pseudo R-square	.0851		.0854		.0883		.2294	
Change in Pseudo R-Square			.0003		.0029		.1411	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.

\+ p<.10 * p<.05 ** p<.01 *** p<.001

Hypotheses 8a, 8b and 8c

Table 16 on page 137 presents the findings of an OLS regression equation. It considers the impact of board meeting context on board-level strategic entrepreneurial attention. This equation corresponds to Hypotheses 8a, 8b and 8c. Models 1, 2 and 3 present the control variables for the equation, with highly correlated control variables entered separately to avoid multicollinearity problems. Model 4 adds the board context variables hypothesized to affect the amount of time that boards allocate to strategic entrepreneurial attention. The results suggest that hypothesis 8a, which posits a positive relationship with off-site percentage of board meetings with strategic entrepreneurial attention, is positive but not significant. Therefore, hypothesis 8a is not supported. Additionally, Table 16 reveals mixed support for hypothesis 8b. Two variables were used for measurement of board meeting frequency (number of meetings per year) and duration (number of meeting minutes per year). Results for both meeting frequency and duration were positive, but only the meeting frequency variable was found to have a significant relationship with board-level strategic entrepreneurial attention. Consequently, hypothesis 8b is not supported. Further, the results suggest that the less an agenda's detail the more time board's allocate to strategic entrepreneurial attention. This relationship is found to be significant (.001 level). Therefore, Hypothesis 8c is strongly supported.

Table 15

Moderating Impact of Governance Issues between Board of Breadth of Knowledge and Board-Level Entrepreneurial Attention

Results of OLS Regression Models

(Testing Hypothesis 7)

Firm-Years Without an Apparent Governance Issue (n=1418)				
	Board-Level Entrepreneurial Attention			
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-.0302*** (.0044)	-.0278*** (.0048)	-.0438*** (.0093)	-.0701*** (.0091)
Firm Size	.0080*** (.0010)	.0080*** (.0009)	.0070*** (.0010)	.0051*** (.0010)
Firm Outstanding Stock	.0107*** (.0030)	.0107*** (.0030)	.0105*** (.0030)	.0093*** (.0029)
Firm R&D Expense	.0222*** (.0041)	.0224*** (.0041)	.0199*** (.0042)	.0114 (.0040)
Firm Age		-.0001 (.0001)	-.0001 (.0001)	-.0001 (.0001)
Relative Board Tenure			.0022** (.0008)	.0026*** (.0008)
Outside Director Ownership			-.0001 (.0001)	-.00004 (.00007)
Board size			.0088+ (.0046)	.0050 (.0044)
Board of Director Breadth of Knowledge				.0239*** (.0021)
F-Value	135.89***	102.46***	60.59***	74.63***
Model R-square	.2238	.2248	.2312	.2976
Adjusted R-square	.2221	.2226	.2274	.2936

Firm-Years With a Governance Issue (n=52)				
	Board-Level Entrepreneurial Attention			
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	.0068 (.0189)	-.0038 (.0190)	-.0352 (.0343)	-.0479 (.0341)
Firm Size	.0009 (.0033)	.0013 (.0032)	.0030 (.0034)	.0021 (.0033)
Firm Outstanding Stock	-.0051 (.0097)	-.0051 (.0094)	-.0151 (.0116)	-.0232+ (.0121)
Firm R&D Expense	.0343* (.0151)	.0257+ (.0151)	.0151 (.0167)	.0107 (.0164)
Firm Age		.0004* (.0002)	.0005* (.0002)	.0004+ (.0002)
Relative Board Tenure			.0011 (.0022)	.0021 (.0022)
Outside Director Ownership			.0003 (.0002)	.0002 (.0002)
Board size			.0124 (.0152)	.0146 (.0148)
Board of Director Breadth of Knowledge				.0158+ (.0085)
F-Value	3.69*	4.07**	2.76*	2.98**
Model R-square	.1872	.2573	.3055	.3567
Adjusted R-square	.1364	.1941	.1950	.2370

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.

\+ p<.10 * p<.05 ** p<.01 *** p<.001

TABLE 16

Board Meeting Context and Board-Level Entrepreneurial Attention

Results of OLS Regression Models

(Testing Hypothesis 8)

Variable	Board-Level Entrepreneurial Attention							
	Model 1		Model 2		Model 3		Model 4	
Intercept	-.02997***	(.0044)	-.0281***	(.0047)	-.0422***	(.0090)	-.1230***	(.0114)
Firm Size	.0079***	(.0008)	.0079***	(.0008)	.0071***	(.0010)	.0027***	(.0008)
Firm Outstanding Stock	.0103***	(.0029)	.0103***	(.0029)	.0100***	(.0030)	.0030	(.2170)
Firm R&D Expense	.0022***	(.0040)	.0224***	(.0040)	.0202***	(.0041)	.0033	(.0250)
Firm Age			-.0007	(.0001)	-.0005	(.0001)	-.0001+	(.0001)
Relative Board Tenure					.0020**	(.0008)	.0022***	(.0036)
Outside Director Ownership					-.00002	(.0001)	-.0001	(.0001)
Board size					.0076+	(.0044)	.0019	(.0036)
Number of Board Meetings							.0190***	(.0034)
% of Meetings Off-Site							-.0275	(.0198)
Annual Meeting Time							.0002	(.0006)
Agenda Detail							.0244***	(.0014)
F-Value	139.51***		105.00***		61.79***		128.55***	
Model R-square	.2221		.2228		.2283		.4924	
Adjusted R-square	.2205		.2207		.2246		.4885	

Note: Hypothesis betas listed are unstadardized. Standard errors are in parentheses.

\+ p<.10 * p<.05 ** p<.01 *** p<.001

CHAPTER VII

DISCUSSION AND CONCLUSION

The prior chapters introduced the research questions, developed the hypotheses, described the methodology, and reported the results of this study. This chapter provides a discussion of this dissertation's findings, theoretical and practical implications, and its limitations. First, the dissertation's findings are interpreted. Second, theoretical and practical implications derived form the results are discussed. Third, the dissertation's limitations are stated. Finally, I conclude by offering future directions for research regarding both boards of directors and strategic entrepreneurial attention and actions in established organizations.

Interpretation of Results

Control Variables. As noted previously, the analyses used to test this study's hypotheses included seven control variables: firm size, firm outstanding stock, firm research and development expense, firm age, board relative power (measured as relative board tenure and total board stock ownership in firm), and board size. The models incorporated these variables because they have proven to be significant in prior empirical studies related to boards of directors or corporate entrepreneurship. Of these seven control variables, only firm age was sufficiently correlated with the other firm variables to be entered in a separate model (to account for multicollinearity). Otherwise, the two sets of control variables, firm and board, were entered in accordance with Chapter IV's theoretical arguments.

The main findings of this dissertation can be summarized as follows. Of the twenty-one sub hypotheses, categorized theoretically under eight overarching hypotheses, thirteen were found to be significant and were, therefore, supported (12 fully supported, 1 partially supported). The remaining eight hypotheses were not significant or were significant but not in the hypothesized direction. Therefore, these eight hypotheses were not supported. Below, the findings are presented via the theoretical categorization of Figure 1: Environmental Context, Attention Structures (Mediators), Attention to Action, Issues and Answers (Moderator), and Procedural and Communication Channels.

Environmental Context. Prior studies, such as Burt (1983) and Pfeffer & Salancik (1978), have found that boards help firms negotiate through the general (indirect) (i.e. Boyd, 1990) and industrial (direct) environments. This stream of research has explored the effects of environment factors on board composition and structural attributes. Prior studies have not examined how these same environmental factors affect a board's focus of attention or a firm's strategic entrepreneurial actions. Through the theoretical lens of the Attention-Based View, it is hypothesized in this dissertation that a firm's direct environmental context -- measured as a firm's environmental dynamism, munificence and complexity -- will be positively related to board-level time spent on strategic entrepreneurial attention and the number of firm-level strategic entrepreneurial actions. The results of this dissertation suggest that the greater the environmental dynamism or munificence, the more attention firm's boards within that industry will spend on strategic entrepreneurship. Also, the greater the environmental dynamism or munificence, the more frequent the firm will engage in strategic entrepreneurship actions. In sum, environmental dynamism and munificence were found to have the posited positive

relationship with strategic entrepreneurial attention and actions (each at the .001 significance level).

In contrast, the relationships between environmental complexity and board-level strategic entrepreneurial attention and firm-level strategic entrepreneurial actions were not found to be significant. As noted in Chapter III, in comparison to both environmental dynamism and environmental munificence, the empirical evidence investigating environmental complexity is much less substantial. Numerous studies on the same or similar topic have produced conflicting results related to environmental complexity. For example, Dollinger and Golden (1992) found a positive relationship between complexity and performance. In contrast, Wiersema and Bantel (1993) found a negative relationship between complexity and firm performance. Perhaps the construct of environmental complexity is too vague or, ironically, too 'complex' to have a merely linear relationship with most variables.

Hypotheses 2a, 2b and 2c posited that the environmental context may indirectly affect board-level entrepreneurial attention through certain mediating attention structures, specifically aggregate board breadth of knowledge. Similar to the results for Hypotheses 1a-1f, environmental dynamism and environmental munificence were found have a significant positive relationship with board breadth of knowledge. In brief, as a firm's environment becomes more dynamic or more munificent, its board's breadth of knowledge appears to increase (or get broader). This means that more directors are outsiders (intra-industry, inter-industry or general science directors) of the firm. Presumably, the diversity of experience increases so that the board is better able to make sense of and react or anticipate the firm's external environment.

Similar to Hypothesis 1, complexity was not found to be significantly related to a firm's board breadth of knowledge. Alternative explanations for this finding are the same as those for hypotheses 1c and 1f.

Attention Structures (Mediators). In this dissertation's adapted model of Ocasio's (1997) Attention-Based View, attention structures represent mediators that operate to further refine the contextual intersection between the board meeting environment and the firm's environment. For this study, attention structures of interest are:

(1) intra-industry firm size (Hypotheses 3a & 3b),

(2) aggregate board breadth of knowledge (Hypothesis 5a),

(3) insider corporate venturing board percentage (Hypothesis 4),

(4) intra-industry board percentage (Hypothesis 5b),

(5) inter-industry board percentage (Hypothesis 5c) and

(6) general science board percentage (Hypothesis 5d).

Each of these attention structures was hypothesized to have an effect on board-level strategic entrepreneurial attentions. Each of these relationships and their results are addressed below.

Intra-industry firm size was hypothesized to negatively affect board-level strategic entrepreneurial attention. However, and in contrast to the results of prior studies (e.g. Mosakowski, 2002), this study's findings suggest a significant (.001 level) relationship between these two variables, but a positive one rather than the posited negative relationship. Similar findings occur between firm size and firm-level entrepreneurial actions. Ireland et al (2003) may help explain these findings. These authors suggest that, although small firms are typically more effective at identifying

entrepreneurial opportunities, they are less effective at developing and sustaining entrepreneurial opportunities. Consequently, maybe it is in the larger firm contexts where strategically entrepreneurial opportunities make it to the point of being discussed at the board-level. So, even though the coefficients of Hypothesis 3a and 3b are of an opposite sign than that hypothesized, the relationship carries some consistency with both strategic entrepreneurial attention and strategic entrepreneurial action sharing similar results.

A board's breadth of knowledge was posited to have a positive relationship with board-level strategic entrepreneurial attention. The findings suggest that as a board of directors becomes more diverse in experience/knowledge (different kinds of outsiders) -- while also coming from more entrepreneurial contexts (outsiders are from more entrepreneurial firms within the industry, more entrepreneurial industries, or from a general science environment) – the time spent on board-level strategic entrepreneurial attention will increase.

In an attempt to parse out the posited relationship, this dissertation tests the percentage directors of a board that come from:

(1) an insider corporate venturing context,

(2) an intra-industry (more entrepreneurial – measured by relative r&d spending and entrepreneurial actions) context,

(3) an inter-industry (more entrepreneurial industry – measured as relative industrial dynamism and munificence) context, or

(4) a general science (academia or innovation house, research and development lab, etc…) context.

Results showed no significant relationship between boards that have a relatively higher percentage of inside corporate venturing directors on the board and board-level strategic entrepreneurial attention. However, these results must be considered with caution, as the number of firm-years with a corporate venturing insider on the board was only 31 of 1470 observations. Therefore, approximately two percent of the observations had the presence of a corporate venturing insider. Despite the non significance of the hypothesis, this low occurrence of an entrepreneurial insider being placed on the board is somewhat of a finding in itself.

The relationship between intra-industry director percentage of the board and board-level entrepreneurial attention was posited to be positive, as only directors from firms with more entrepreneurial tendencies were considered in this percentage. However, the results suggested a significant, but negative relationship. Perhaps the presence of a higher percentage of intra-industry directors, regardless of the entrepreneurial nature of the firm they come to the board from, focuses attention on more intra-industry competitive tactics rather than broadening the firm's scope of opportunity.

The relationship between inter-industry director percentage of the board and board-level strategic entrepreneurial attention was posited to be positive, as only directors from industries with more entrepreneurial tendencies than those of the focus firm's industry were included in this percentage. The results supported this hypothesis (.001 level). In brief, as the percentage of inter-industry directors from more entrepreneurial industries increases, so too will the percentage of time the board spends on strategic entrepreneurial issues.

The relationship between the general science director percentage of the board and board-level strategic entrepreneurial attention was also posited to be positive. The results suggested that this relationship is both significant (.001 level) and positive. In brief, as the proportion of directors who come from the general science community increases, so too will board-level time spent on strategic entrepreneurial issues.

Attention to Action. Board-level strategic entrepreneurial attention is the central variable in this dissertation's adaptation of Ocasio's (1997) Attention-Based View. Without the board's attention affecting the firm's actions, the model would present no insightful value. The relationship between these two variables was posited to be positive. They were both positive and significant (.001 level). Therefore, as the board spends a larger percentage of their meeting time on strategic entrepreneurship issues, the more likely the firm will engage in strategic entrepreneurial actions.

Issues and Answers (Moderator). Many of the posited relationships between the attention structure variables and board-level strategic entrepreneurial attention have been supported. However, certain issues may arise that take precedence over strategic entrepreneurship issues in competing for the board's attention. For example, the hierarchy of board roles, discussed in Chapters II and IV, suggests that governance issues would constitute such attentional diversion. The analysis for this relationship was conducted on a split-sample. The split was based on the occurrence or non occurrence of a governance issue. Results of this moderating hypothesis suggest that the relationship between a board's aggregate breadth of knowledge and its attentional allocation toward strategic entrepreneurial issues (found to be significantly positive in Hypothesis 5a) was weakened in the occurrence of governance issues. However, as in the insider corporate

venturing director findings, this finding must also be cautiously considered as only 51 of 1470 observations had an occurrence of a governance issue. The data for this study included the fiscal year ends 1994 through 2000, prior to the many regulatory and other pressures for governance reform.

Procedural and Communication Channels. Figure 1 also depicts three dimensions (first posed by Stinchcombe, 1968) -- spatial, temporal and procedural -- that are posited to have an affect on board-level strategic entrepreneurial attention. This dissertation considered these dimensions in an attempt to better understand the board meeting context and how each dimension may affect board-level strategic entrepreneurial attention. It was hypothesized that the greater the percentage of board meetings held away from the normal/typical meeting place (spatial dimension), the greater the board-level strategic entrepreneurial attention. However, this relationship was not found to be significant or positively related. The temporal dimension posited that the greater the amount of meeting time a board had annually and the greater the number of meetings they had, the more time they would allocate toward strategic entrepreneurial attention. The results for this two pronged hypothesis were mixed. The positive relationship between the increased frequency of board meetings and increased board time allocated to strategic entrepreneurial attention was significant (.001 level). However, the relationship between the duration of the board meetings and strategic entrepreneurial attention was not significant. The procedural dimension suggests that there is a positive relationship between decreasing detail of the board meeting agenda and the board's attentional allocation toward strategic entrepreneurial issues. The results significantly (.001 level) supported this hypothesis. Therefore, as fewer constraints are imposed on the board by

the person who sets the agenda, the more time that the board will spend on strategic entrepreneurship issues.

Theoretical, Methodological and Practical Implications

The empirical findings in this dissertation suggest interesting implications for theoretical, methodological and practical purposes. I will first present the theoretical implications, followed by the methodological implications, and conclude with the practical implications.

Within the set of results examining board meeting context, strong patterns emerge. The primary set of patterns concerns the individual and collective experience breadth of the directors and how this breadth aids in shaping the attention of the meeting. Consistent with prior literature (Johnson, et al, 1996; Finkelstein & Hambrick, 1996; Dalton, et al, 1998), the classification of directors emerges as a key factor related to board impact. Specific to this study, the impact of interest was board meeting time allocated toward strategic entrepreneurship. The collective measure of board breadth of knowledge and the individual experience measures -- the percentage of inter-industry directors from more entrepreneurial industries and the percentage of general science directors -- were found to be significantly (.001 level) and positively related to increases in the board's allocation of time (and thus attention) to strategic entrepreneurship.

Utilizing the Attention-Based View, this dissertation considers the multiple contexts that boards of directors must operate within and attempt to affect in the favor of the company for which they serve. This more accurate depiction of the contexts that the board encounters and makes its decision within allows researchers to apply a more fully

specified model of boards than those applied in the past, which typically examined each relationship separately.

Methodologically, this study makes a contribution through its unique classification of outsiders' recent experience relative to the firm's industry (used as a proxy of a director's entrepreneurial disposition). Board researchers have argued that boards need to have a high degree of specialized knowledge and skills to perform effectively (Forbes & Milliken, 1999). However, the relevance of director specialization surely depends on the issues on which expertise or perspective is of most importance to the firm's success. Therefore, in an effort to explore strategic entrepreneurship and board relationships, this study utilized a categorization system that attempted to classify directors based on their varying entrepreneurial experience contexts. This classification, as noted above, resulted in many significant relationships. These findings offer the first empirical support for a more detailed parsing of the more common dichotomous classification of directors as merely insider or outsider. The importance of outsiders who approach the director's table from a more strategically entrepreneurial context appears to affect the attentional allocation within the meeting. Of course, there is an implicit assumption, and potential limitation, that a director's expertise will be used.

Another methodological contribution is the use of content analysis to code company board minutes. Based upon the directors' discussions recorded in the minutes, this dissertation assumed that attentional allocation (via discussion) was based on perceived importance of issues to the firm. The access to and analysis of this quantity of board minutes is unique to prior literature.

From a practical perspective, the results of this dissertation suggest that shareholders need to consider both the environmental context that their firm competes in and the competitive context from which directors are nominated and selected. There are direct relationships between environmental dynamism and environmental munificence. Also, there are significant indirect relationships through board mediators to board-level strategic entrepreneurial attention and through board-level attention to firm-level strategic entrepreneurial actions. To best increase the probabilities that a firm will act in a strategically entrepreneurial manner, a shareholder should attempt to elect directors from outside its own industry and perhaps outside of business (general science). Ghoshal and Nohria (1989) notes that from a practical standpoint, board structure is one of the few factors in today's complex, uncertain business environment that boards and top management teams (TMT) can directly control. Therefore, the questions examined in this dissertation directly inform key strategic decisions made by firms.

Limitations

A possible limitation of this study is a mis-specified model. Other mechanisms employed by firms to reduce environmental uncertainty were not considered. For example, Pfeffer and Salancik (1978) suggest that firms may use control (e.g., mergers and acquisition), coordination (e.g., trade associations, cartels), cooperative (e.g., joint ventures, strategic alliances), and cooptation activities to reduce environmental uncertainty. This study, however, only examined the association of boards of directors as sense makers of the uncertain environment related to opportunities for the firm.

Consequently, the presence of other mechanisms used to reduce environmental uncertainty, which were not measured in this study, may have affected the results.

The omission of top management team (TMT) characteristics may have influenced the results of this study. Perhaps these characteristics, which were not included in the models, also help firms to negotiate uncertainty (e.g., D'Aveni & Macmillan, 1990). This study did not include several variables that could help in explaining variations in strategic entrepreneurial attention and actions. However, it is important to note the focus of this study is on boards of directors' posited relationship with strategic entrepreneurship.

The use of demographic factors to serve as proxies for latent constructs may represent a potential limitation of this study. When interpreting the results of this study, it is important to recognize the literature admonishing the dangers of this type of "black box" research (e.g. Lawrence, 1997; Priem, Lyon, & Dess, 1999). This stream of research suggests that demographic variables are not necessarily congruent with the subjective concepts (e.g., communication frequency, cognitive diversity) that they purportedly represent (Lawrence, 1997). As a result of these weaknesses, critics warn that the interpretation of the results of such studies is precarious and potentially misleading. In essence, this study employs demographic variables to represent latent constructs such as aggregate board level breadth of knowledge. However, the variables used in this study may not be congruent with these subjective concepts, and consequently, this study maybe subject to the dangers of misapplication.

An additional potential limitation of this study is its assumption of a two year lag between board-level attention and firm-level actions related to strategic entrepreneurship.

Given that the board of director's impact on firm actions is highly complex, this time lag may be less in some instance and more in others, depending on the scope and size of the action.

The three diverse industries allow these finding to be conveyed over a large population of firms. But, the generalizability of its findings to firms of certain sizes may be suspect. The sample of firms began with a diverse set of companies of different sizes. Unfortunately, a disproportionate number of small companies had to be dropped due to poor minute detail. Therefore, larger firms are more heavily represented in the current sample. Therefore, the generalizability of findings is more applicable to them.

Directions for Future Research

Several areas in the board of directors and strategic entrepreneurship literatures provide promise for future investigation. Future topics include the association between top management team (TMT) characteristics and strategic entrepreneurship attention and actions, firm founder's role, and CEO characteristics.

Additionally, broadening the sample of contexts beyond the three industries selected for this study would be wise. While these three industries were intentionally selected due to their variance in direct environmental contexts, there are many contexts in between and at each extreme that may produce varying results.

The manner in which this study collected data from board minutes opens the "black box" of board activity and how this activity related to actions. The answer to "how do boards matter?" appears much more attainable.

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APPENDIX A

LIST OF KEY WORDS/PHRASES FOR SEARCHING STRATEGIC ENTREPRENEURIAL ACTIONS

Key Words/Phrases

Acquire (acquisition) Acquire (acquisition)
Action
Alertness
Change
Differentiate
Discovery
Competitive advantage
Create (creation, form, produce, make, originate)
Develop
Discover
Diversify
Enterprising
Entrepreneurial
Exploit
Firm capabilities
Future
Growth (grow)
Improve
Innovate
Intrepreneuring
Invent
Invest
Joint venture
Market
Merger
Networks
New strategy
New market
New product
New process
Novelty
Patent
Opportunity
Proactive
Research and Development
Renewal
Risk
Spin-off
Strategy
Take a chance
Take advantage of
Uncertainty
Venture

APPENDIX B

LIST OF KEY WORDS/PHRASES FOR SEARCHING CORPORATE GOVERNANCE PROBLEMS

Key Words/Phrases
Accountability
Accusation
Agency problem
Charges
Cheat
Complaint
Conflicting interests
Corporate governance
Corruption
Criminal
Crisis
Deceive
Deceit
Deceptive
Dishonest
Ethics
Falsify
Fraud
Governance
Grievance
Illegal (wrong, unlawful)
Improper
Inflating
Legal
Lie
Malfeasance (wrongdoing)
Mismanagement
Proxy proposal
Overstated
Restate
Scandal
Securities and Exchange Commission
Understated
Unethical

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