

THE EFFECT OF BOARD CAPITAL AND CEO POWER ON STRATEGIC CHANGE

KATALIN TAKACS HAYNES¹* and AMY HILLMAN²

¹ *Mays School of Business, Department of Management, Texas A&M University, College Station, Texas, U.S.A.*

² *W.P. Carey School of Business, Department of Management, Arizona State University, Tempe, Arizona, U.S.A.*

We develop the construct of board capital, composed of the breadth and depth of directors' human and social capital, and explore how board capital affects strategic change. Building upon resource dependence theory, we submit that board capital breadth leads to more strategic change, while board capital depth leads to less. We also recognize CEO power as a moderator of these relationships. Our hypotheses are tested using a random sample of firms on the S&P 500. We find support for the effect of board capital on strategic change, and partial support for the moderating effect of CEO power. Copyright © 2010 John Wiley & Sons, Ltd.

INTRODUCTION

Board capital, a construct recently coined as the composite of the human and social capital of the board of directors, is intended to capture the ability of the board to provide resources to the firm (Hillman and Dalziel, 2003). In its resource provision function, the board provides advice and counsel to the firm on substantial matters such as strategy formulation, access to information outside the firm, preferential access to valuable resources through personal connections, skills and expertise, and legitimacy (Pfeffer and Salancik, 1978). However, while board capital may be easily understood as the combination of human and social capital of the directors, scholars often note the interdependent nature of human and social capital (Coleman,

1988; Nahapiet and Ghoshal, 1998), and the inability to isolate the effects of one from the other. Recognizing the interdependent nature of the human and social capital of directors, we propose a model of board capital that isolates the relevant aspects of the human and social capital of the directors with respect to their resource provision function and aggregate these aspects from the individual to the board level (Van Maanen, Sørensen, and Mitchell, 2007).

We propose that the board capital construct is composed of 'breadth' and 'depth.' Board capital breadth is defined as the portfolio of directors' functional, occupational, social, professional experiences and extra-industry ties and captures the heterogeneity of the directors' human and social capital. Board capital depth refers to the embeddedness of directors in the firm's primary industry through interlocking directorships, managerial positions, or occupational experience in the primary industry of the firm, and is the sum of the directors' intra-industry human and social capital.

Boards use their human and social capital to perform their roles of monitoring and resource provision. This latter role draws upon resource

Keywords: boards of directors; board composition; human capital; social capital; power; strategic change

*Correspondence to: Katalin Takacs Haynes, Mays School of Business, Department of Management, Texas A&M University, 4221 TAMU, College Station, TX 77843-4221, U.S.A.
E-mail: khaynes@mays.tamu.edu

Copyright © 2010 John Wiley & Sons, Ltd.

dependence theory (Pfeffer and Salancik, 1978), and includes a variety of activities, including providing advice to management on major strategic actions. The current study examines the effect of board capital breadth and depth on strategic change decisions, namely, strategic variation and strategic deviation. Strategic change, the difference in the 'fundamental pattern of present and planned resource deployments' (Hofer and Schendel, 1978: 25; Rajagopalan and Spreitzer, 1997), is considered by some researchers to be a major source of competitive advantage and firm survival (Carpenter, 2000). Strategic change has been operationalized as having two components: 1) strategic variation, or departures from the firm's historic resource allocation pattern, and 2) strategic deviation, or departures from industry norms of resource allocation (Carpenter, 2000). We also explore how CEO power moderates the relationships between board capital and strategic variation and deviation.

The current study makes several contributions to the board literature. First, we provide the first empirical testing of the 'board capital' construct that we are aware of, but take its theoretical development one step further by deconstructing the previous conceptualization as the sum of individual-level human and social capital into breadth and depth components. In doing so, we facilitate a better understanding of the bundle of resources, skills, and ties the board can put into use for the firm and may provide further insight into how these dimensions shape board functions and effectiveness. Second, we examine how these dimensions of board capital affect strategic change, an outcome that is more proximal to the board's influence than is firm performance. The choice of strategic change allows us to begin empirical testing of Hillman and Dalziel's (2003) theoretical model using a more proximal outcome of the board. Third, we identify an important moderator, which is likely to improve our understanding of when these dimensions of board capital are most likely to be important.

The remainder of the paper is organized as follows. First, we review the research literature related to the board capital construct and identify the aspects of human and social capital relevant to the board's resource provision function. We then discuss how to aggregate the selected aspects of human and social capital from the individual to the group level and present the dimensions of board capital breadth and depth. This is followed by a

brief review of the literature on the role of boards in strategy and hypotheses linking the two dimensions of board capital breadth and depth to strategic change. Finally, we explore the moderating effect of CEO power on the relationship between board capital and strategic change in our final hypotheses, followed by the description of the empirical methods and the results of the statistical analysis and discussion of findings. Limitations, recommendations for future research, and the conclusions are then provided.

BOARD CAPITAL

The concept of board capital was introduced in the strategic management literature by Hillman and Dalziel (2003) as the sum of the human and social capital of the board of directors, and a proxy for the board's ability to provide resources to the firm. The board's resource provision function is based on Pfeffer and Salancik's (1978) work in resource dependence theory according to which directors are expected to provide advice and counsel, bring legitimacy and access to important constituents outside the firm, serve as channels of communication between the firm and the environment, and aid in strategy formulation. Pfeffer and Salancik write that when a director is appointed to a board, that director is expected 'to support the organization' and 'will concern himself with its problems, will variably present it to others and will try to aid it' (1978: 163). The current study focuses specifically on what allows directors to 'provide ongoing advice to top managers on possible strategic changes' (Carpenter and Westphal, 2001: 639).

Hillman and Dalziel (2003) assert that board capital, or the sum of individual director's human and social capital, represents the ability of a board to engage in such activities. An individual's expertise, experience, knowledge, reputation, and skills are defined by Becker (1964) and Coleman (1988) as 'human capital' whereas an individual's 'social capital' is 'the sum of the actual and potential resources embedded within, available through, and derived from, the network of relationships possessed by an individual' (Nahapiet and Ghoshal, 1998: 243). While the initial conceptualization of board capital as the sum of the directors' human and social capital appears to be appropriate, a closer examination reveals gray areas that warrant additional in-depth inquiry.

First, scholars often recognize the interdependent nature of human and social capital (Coleman, 1988; Nahapiet and Ghoshal, 1998) and the difficulty in isolating the effect of one from the other. For example, Mizruchi and Stearns (1994) discuss the benefits of the knowledge, skills, and expertise (i.e., human capital) members of financial institutions can bring to the firm when serving as directors, but also the access to financial capital their connections (i.e., social capital) allow. Geletkanycz and Hambrick (1997) show that extraindustry ties (social capital) lead to exposure to novel information (human capital). These are but a few examples of the mutual influence that human and social capital have on one another (Coleman, 1988) that render the benefits of a director's human capital difficult to separate from those of his/her social capital.

Second, many research studies use proxies of the board's human and/or social capital that limit our understanding of the construct. For example, the inconclusive findings of studies linking board size and firm level outcomes (Dalton *et al.*, 1999) may be due to size being a gross proxy for board capital. Such studies examine size based on the assumption that 'the greater the need for external linkage the larger the board should be' (Pfeffer and Salancik, 1978: 172); yet using size overlooks important nuances in the board's human and social capital. As an illustration, a hypothetical three-person board composed of Warren Buffett, Peter Lynch, and Michael Bloomberg would be deemed 'small' and judged inadequate based on size alone. However, examining board capital breadth and depth in lieu of size allows for a more complete view of board capital and is consistent with Boyd's (1990) conclusion that high performing firms often have fewer, more densely connected directors.

A third concern is that many research studies that do use more specific indicators of board capital often examine only one aspect of board composition. Indicators of human or social capital of directors have separately been linked to strategic outcomes, but to our knowledge never both. For example, Goodstein, Gautam, and Boeker (1994) look at 'human capital'-type heterogeneity while Geletkanycz and Hambrick (1997) examine heterogeneity of social capital (ties). Instead we capture a wide range of the relevant aspects of board capital with respect to the board's role in strategic change. Thus, by capturing a wide range of relevant aspects of human and social capital and recognizing the

interdependence between the two, our development of the board capital construct includes the consideration of validity and reliability.

Finally, we approach board capital keeping in mind theoretical and methodological issues of multilevel construct development. When developing a new construct, the 'right factors' must be included, leading to comprehensiveness and parsimony (Whetten, 1989). Accordingly, with the board capital construct we aim to capture the range of human and social capital that the board has. Since the board is a group, we conceptualize board capital as a high, group-level construct, and assign it the most appropriate composition model (Chan, 1998).

Figure 1 illustrates the board capital construct with its two dimensions and the indicators of the dimensions. In bringing the two dimensions of board capital together as one construct, the emphasis is on capturing the human and social capital makeup of the board, rather than revisiting/repackaging results from other studies. While research on various types of board heterogeneity abounds, heterogeneity is but one component of a board. Research on the embeddedness of the board in the focal firm's industry is scarcer, yet, depth is a relevant and important component of board capital.

Board capital breadth

The first dimension of board capital, 'breadth,' captures various facets of the heterogeneity of the board such as education, functional background, occupation, age, tenure, and the heterogeneity of industry ties through interlocks, or work experiences in other industries. Conceptually, board capital breadth (BCB in tables and figures) builds on the research literature on group heterogeneity (Jackson, May, and Whitney, 1995), which indicates that, in general, more heterogeneous groups are more creative and make better decisions. Board capital breadth is different from a single measure of diversity or heterogeneity, since it captures multiple aspects of heterogeneity of human and social capital. Further, it is also a subcomponent of the higher-order board capital construct. Therefore, it is a component necessary to understand the more holistic construct of which it is a part.

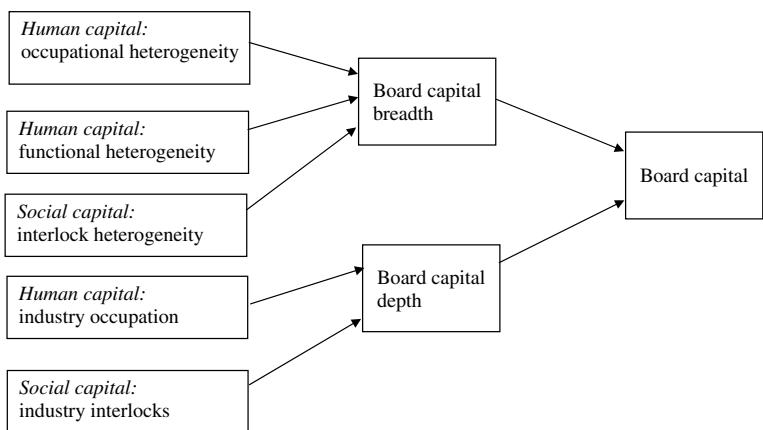


Figure 1. The model of board capital

The breadth aspect of board capital conceptually captures (and empirically measures) heterogeneity. Thus this dimension is best described by a compilation model (Kozlowski and Klein, 2000), which is intended to capture the dispersion of the human and social capital of the board. In other words, the within-group variance of directors' human and social capital is operationalized as the higher-level construct (Chan, 1998) of board capital breadth. Harrison and Klein (2007) refer to this as a 'variety-type' of heterogeneity measure, which are the best type to capture content and functional background expertise, nonredundant network ties, and experience in a range of industries.

Board capital depth

Board capital depth (BCD in tables and figures) refers to the embeddedness of the board in the focal firm's industry. Industry embeddedness is a result of directors' current or former industry work experience, their horizontal or vertical (up or downstream) ties to firms in the industry (Pennings, 1980), broadly defined, through interlocking directorates, and current or former occupation or supporting service roles such as industry-specific legal counsel or consulting. Access to more or better information through a variety of industry ties enables the firm to lessen the impact of uncertainty originating in its immediate industry environment. In other words, a firm whose board members have multiple ties to the firm's main industry is better equipped to survive and thrive because it can more quickly understand industry events and trends.

The board capital depth dimension is intended to capture this human and social capital through an isomorphic composition model (Kozlowski and Klein, 2000). An important feature of such models is shared knowledge and mental models, and measurement of similar unit-level contributions is done via summing or means. Board capital depth captures the industry-based shared mental models of the directors at the board level. A board with directors deeply embedded in industry through occupation and industry ties is likely to devise or approve strategies that converge to industry central tendencies.

BOARD CAPITAL AND STRATEGIC CHANGE

Firms draw upon the board of directors for important resources including expertise and guidance in strategic change (Goodstein *et al.*, 1994) as well as other strategic decisions. Directors in small (Eisenhardt and Schoonhoven, 1990; Daily and Dalton, 1993) and large (Johnson, Hoskisson, and Hitt, 1993) firms alike directly influence organizational processes and strategic outcomes (Eisenhardt and Schoonhoven, 1990; Daily and Dalton, 1993). *The Principles of Corporate Governance* by the Business Roundtable indicate that directors are expected to share their wide 'range of experience, knowledge and judgment' and advise management on significant issues facing the corporation, and review and approve major corporate actions (Business Roundtable, 2005: 7). Stiles writes, 'In broad terms, the board's role has less to do with strategy formulation than with setting the strategic context

and acting as gatekeeper for strategic proposals' (Stiles, 2001: 634). This gatekeeping function is particularly fitting with respect to strategic change and especially resource allocation decisions, as noted by Stiles and Taylor (2001: 39) who quote a board chairman saying, 'how resources are to be allocated around the organization, is in the domain of the board.'

Boards affect strategic decisions of the firm through their human and social capital, as indicated by studies that link individual indicators of board capital such as directors' functional, occupational, and other experiences to the firm's strategy (Judge and Zeithaml, 1992; Carpenter and Westphal, 2001; Jensen and Zajac, 2004). For example, the strategic context of directors' social network ties determines the board's ability to contribute to strategic decision making (Carpenter and Westphal, 2001). Carpenter and Westphal (2001) find that appointments to boards facing strategically similar environments enhance the directors' ability to advise management at the focal firm. Regarding the human capital component, Jensen and Zajac (2004) show that differences in the individual characteristics of members of the corporate elite (e.g., directors) lead to differential preferences in corporate strategies such as related and unrelated diversification. Combined, these research studies show that a board's human and social capital can play a significant role in advising management about firm strategy; however, none examine these relationships beyond single indicators of human or social capital.

Building on Mintzberg's (1978) definition of strategy as a pattern of managerial decisions, a number of authors have used patterns of strategic resource allocations to capture strategic change, or conversely, strategic persistence of firm strategies over time, as well as conformity to industry norms. Finkelstein and Hambrick (1990) developed a strategic resource allocation profile (SRAP) measure composed of six dimensions, which, when observed over time, represents the strategic decision pattern of the firm. SRAP includes three basic resource allocation ratios (advertising expenses/sales, research and development [R&D] expenses/sales, and net plant and equipment/gross plant and equipment), as well as ratios of the expense structure (selling, general, and administrative [SG&A] expenses/sales), working capital management and production cycle time (inventory/sales), and finan-

cial leverage (debt/equity). Finkelstein and Hambrick (1990) find that the summary measures of the indicators more closely reflect strategic conformity to industry norms and strategic persistence of firm strategies over time than the individual indicators do. A number of other authors used SRAP to capture strategic persistence and conformity, strategic choice, or strategic change (Finkelstein and Hambrick, 1990; Geletkanycz and Hambrick, 1997). We adopt Carpenter's development of strategic change to include two aspects: strategic variation, or a change in the 'pattern of a firm's resource commitments over time, relative to its past pattern,' and strategic deviation, a shift away from the 'firm's resource commitments from industry norms of competition' (Carpenter, 2000: 1182).

Board capital breadth and strategic change

At the core of the heterogeneity: organizational outcome linkage is the notion that complex strategies require cognitively heterogeneous leadership teams (Priem, Lyon, and Dess, 1999). Demographic measures are proxies for cognitive heterogeneity (Milliken and Martins, 1996) and demographic heterogeneity is shown to lead to better firm performance in turbulent environments (Haleblian and Finkelstein, 1993), more innovative leadership (Wiersema and Bantel, 1992), and more creativity (Bantel and Jackson, 1989).

Heterogeneous boards have more breadth of knowledge, creativity, and experiences, as well as more access to valuable resources outside the firm. A number of studies support the notion that heterogeneity of human and social capital (board capital breadth) leads to not only more options considered but also to more options acted upon, so that potential strategies lead to realized strategic change. For example, Golden and Zajac (2001) find board member occupational heterogeneity is associated with varied board member experiences and expertise, which in turn are positively associated with strategic change.¹ Conversely, homogeneous

¹ While some research studies show a negative relationship between director heterogeneity and strategic change, we believe a positive relationship is most appropriate here. First, Goodstein *et al.*'s (1994) study is limited to small- and medium-sized hospitals in times of turbulence. Second, Westphal and Bednar's (2005) findings are predicated on poor firm performance and reactions to it. Both also limit their measures to demographic heterogeneity and do not include measures of social capital. Our sample and its context do not fit these limitations and, thus, we rely on the overall support for heterogeneity and change.

boards are likely to consider a narrower array of options and strategies (i.e., those favored by the overrepresented functional area). For example, Eisenhardt, Kahwajy, and Bourgeois (1997: 48) write, individuals 'who have grown up in sales and marketing typically see opportunities and issues from vantage points that differ from those who have had primarily engineering experience.'

High board capital breadth results from directors' nonredundant, diverse functional and occupational backgrounds, and their ties to a variety of industries. As noted by Golden and Zajac (2001), boards with a wider array of director experiences are likely to consider a broader array of strategic options. In support of this view, Miller, Burke, and Glick (1998) note that cognitive heterogeneity enhances the comprehensiveness and extensiveness of strategic choices. While all directors are likely familiar with the range of strategic options, those with direct experiences with such have a deeper understanding of strategic processes and are likely better equipped to devise and monitor them. Therefore,

Hypothesis 1: Greater board capital breadth leads to more strategic change.

Board capital depth and strategic change

Resource dependence theory scholars (Pfeffer and Salancik, 1978) suggest acquiring industry-specific information from multiple sources via members of the board enables the firm to better handle uncertainty by anticipating and responding to competitive moves and by gaining superior knowledge of its competitors and industry opportunities and trends. Industry experience, whether through industry occupation or interlocking directorates, provides valuable industry-related information.

Industry embeddedness results in similar backgrounds, common life experiences and values that make 'interacting with each other easier, positively reinforcing, and more desirable. Similarity provides positive reinforcement for one's attitudes and beliefs while dissimilarity is seen as punishment' (Williams and O'Reilly, 1998: 87). Further, industry is the 'primary analytic environment' of the firm. The industry recipe, or industry collective response, is essential to strategy formation and in determining what is operationally and professionally appropriate. The industry recipe 'suggests a

pattern of appropriate resources as well as a way of looking at the world' (Spender, 1989: 192).

Thus, as industry embeddedness increases, strategic changes recommended and approved by the board will compel the firm to take strategic actions similar to the ones in its industry (Prahalad and Bettis, 1986). Managers with similar industry backgrounds and ties hold similar perceptions and beliefs about various aspects of strategic decision making as shared knowledge of the industry becomes 'taken for granted' making the firm resistant to change (Huff, 1982; Hambrick, Geletkanycz and Fredrickson, 1993). Intra-industry ties increase strategic conformity to industry norms, while extra-industry ties increase deviation from industry norms (Geletkanycz and Hambrick, 1997). Finally, membership in an industry places an individual in a setting in which interpretations of events and solutions to problems are filtered through shared knowledge or 'industry wisdom' (Burrell and Morgan, 1979). The more a person is embedded in industry, the more difficult it is for that person to consider alternative solutions or to question the correctness of their ways (Huff, 1982). In sum, these research studies indicate that if board capital is concentrated through industry knowledge, tenure, experience, and network ties such as board interlocks, industry occupations, or industry-related support roles (e.g., legal counsel or consultant specializing in serving firms in a specific industry), the strategic decisions the board makes will reflect the dominant strategy patterns of the industry. Thus,

Hypothesis 2: Greater board capital depth leads to less strategic change.

The moderating effect of CEO power and preferences

While we submit that board capital depth and breadth have direct effects on strategic change, CEO preferences are expected to moderate these relationships, especially if the CEO is powerful vis-à-vis the board. A powerful CEO threatens the independent judgment of the board (Dalton and Kesner, 1987), and his or her preferences dampen the effect of the board (Boyd, 1994). Without a powerful CEO, however, directors engage in more discussion and debate that allows more diverse viewpoints to surface (Zahra and Pearce, 1989). CEO power may manifest in several forms, such

as CEO entrenchment, which reduces board effectiveness (Finkelstein and D'Aveni, 1994), or CEO duality (Zahra and Pearce, 1989). We adopt Finkelstein's definition of CEO power, as 'the capacity of individual actors to exert their will' (Finkelstein, 1992: 506).

Power plays a key role in strategic decision making, strategic choice (Child, 1972), and strategic change. Golden and Zajac (2001), for example, find that when CEOs have power vis-à-vis the board, the board is less likely to have an effect on strategic change. Executives' preferences are expressed when they hold powerful positions (Eisenhardt and Bourgeois, 1988; Finkelstein, 1992). Therefore, we propose that a CEO's preferences with respect to strategic change (or persistence) prevail when the CEO is powerful vis-à-vis the board. However, when the CEO is not, the relationship between board capital and strategic change is unaltered.²

Regarding the firm's past operating history, one such CEO preference is the commitment to the *status quo*.³ Hambrick *et al.* (1993: 402) define commitment to the *status quo* as the 'belief in the enduring correctness of current organizational strategies and profiles' and suggest that CEOs may show a higher commitment to *status quo* than others. According to Carpenter (2000), investments into human capital, plant, equipment, and technology induce firms to remain committed to the established course of action. In addition, the relative risky nature of change (Henderson and Fredrickson, 1996) compared to the relative safety of 'staying the course' may contribute to the CEO's commitment to the *status quo*. As noted by Eisenhardt (1989), the performance outcomes of strategic change are highly unpredictable and inherently risky to both the firm and the CEO's job. The risk factor is also relevant in light of the Sarbanes-Oxley Act of 2002.⁴ Sarbanes-Oxley requires more

accountability from managers and specifies civil and criminal liabilities for noncompliance. Westphal and Bednar (2005) also maintain that strategic persistence, or remaining committed to previous strategy, is the preferred response of managers even when faced with poor performance. Finally, CEOs are also rewarded for strategic persistence. Grossman and Cannella (2006) find CEOs who are also board chairs receive higher total compensation for staying the course. These empirical results indicate that when facing a decision about strategic change, powerful CEOs vis-à-vis the board, are more likely to remain committed to the *status quo* and dampen the effect of board capital on strategic change. Thus, we suggest that the preferences of a board with high board capital breadth and the preferences of the CEO regarding strategic change differ. Therefore,

Hypothesis 3a: CEO power moderates the relationship between board capital breadth and strategic change, such that under high CEO power, board capital breadth produces less strategic change.

CEOs may also become attached to the *status quo* dictated by industry central tendencies that result from industry strategic norms (Carpenter, 2000). This may be a result of a number of factors, including competitive interdependence among firms within an industry and intra-industry succession. Scherer (1980) points out that industry level influences lead to industry conformity by discouraging strategic change. Spender (1989) submits that industrywide norms reduce competitive uncertainty. Thus, CEOs remain committed to past strategies (Datta, Guthrie, and Rajagopalan, 2002) within an industry because they bring about an element of stability in the industry or immediate competitive environment. Further, intra-industry succession is associated with the focal firm's strategic conformity to industry central tendencies (Zhang and Rajagopalan, 2003), indicating that industry effects outweigh the importance of adopting 'novel strategies' often associated with the appointment of a new CEO. In other words, even though newly appointed CEOs are known for their proclivity for change, if the CEO is from the firm's own focal industry, the mandate for change is overridden by the mandate to conform to industry norms.

² We recognize the board chair may also be important, but we do not focus on this because the power of the CEO ultimately affects not only the board's process and outcomes affecting strategic change but also their implementation within the firm. Practically speaking, the overwhelming majority of firms have CEO duality where the CEO is also chair, so we chose not to develop propositions regarding the chair.

³ While some new CEOs may be hired with a change mandate, what we consider here is the central tendencies of existing CEOs, acknowledging that there are times when *status quo* persistence is not likely.

⁴ Sarbanes-Oxley Act of 2002, Public Law 107–204, U.S. Statutes at Large 116 (2002): 745.

Further, while CEO preferences regarding adhering to industry norms are likely the same, in the case of a powerful CEO, the preference can be observed in the actual strategic choices the firm makes. Thus, as in the above hypotheses, when CEOs are powerful vis-à-vis the board, their preferences for conformity with industry norms will prevail and as such will amplify the inertial tendencies of board capital depth; thus, producing even less strategic change. Therefore:

Hypothesis 3b: CEO power moderates the relationship between board capital depth and strategic change such that under high CEO power, board capital depth produces less strategic change.

METHODS

Research setting

The dataset to test the hypotheses consists of a true random sample of Standard & Poor's 500 firms. We based our sample size of 250 on power analyses, allowing for some missing data. Fourteen firms were dropped due to missing data, rendering the final dataset of 236 firms. All firms in the sample are mature, large market capitalization firms, representing 97 industries at the four-digit Standard Industrial Classification (SIC) code level. Since none of the firms are conglomerate unrelated-diversified, assigning a primary industry is appropriate. The boards consist of over 2,500 individual directors, whose individual backgrounds were captured by two coders with a 97 percent interrater reliability. Table 1 includes the descriptive statistics and the correlations of the data. The high interrater reliability was obtained through a multistep process. First, initial guidelines were set to guide the coders on interpreting the information in the bios. The first round of trial coding was followed by a discussion comparing, resolving, and documenting cases that the coders interpreted differently.

Dependent variables

Strategic change was measured using two multi-item measures developed and validated by Finkelstein and Hambrick (1990) with the exception that we calculated strategic change operationalized

as strategic variation and deviation, rather than strategic persistence or conformity. Conceptually, strategic variation is a departure from prior firm strategies, whereas strategic deviation is divergence from industry norms. Thus, *strategic variation* indicates the degree to which a firm's strategy varies over time and *strategic deviation* captures the degree to which its strategy differs from industry norms, using a composite measure of six resource allocation ratios. The measure is composed of six resource allocation dimensions: advertising intensity (advertising/sales); R&D intensity (R&D/sales); plant and equipment upgrades (new plant and equipment/gross plant and equipment); nonproduction overhead (SG&A expenses/sales); inventory levels (inventory/sales); and financial leverage (debt/equity). The data for the measures were collected from COMPUSTAT. Finkelstein and Hambrick (1990) used these six ratios because of their importance on firm performance, their controllability by top management, their complementarity to one another, and the availability of the data via COMPUSTAT. It must be noted, however, that some of the data in COMPUSTAT was missing due to lack of reporting or because the firm either did not have a particular expense (e.g., banks did not report R&D or inventory) or because the expense was reported elsewhere (e.g., some firms reported advertising under SG&A). To mitigate the problem of the missing variables, we calculated the ratios twice. In one case, all six ratios were included with a zero value for the missing data, in the other case, the most common missing variables (R&D, advertising, and inventory) were excluded, and only the remaining three ratios were included in the final calculation.

The *strategic variation* index tracks strategic changes over time, and is calculated using a combination of exponential smoothing and Euclidean distance calculations. With t=2002, the focal year of our study, we took the actual resource allocation figures for each year and each company and, using exponential smoothing, calculated the baseline strategic variation for each firm, for t-4 through t, (1998–2002). Thus, we use a five-year window of the actual historical resource allocation figures to establish the variation pattern of each firm since this is broad enough to capture strategic change, yet narrow enough to exclude changes in the external environment that we would not be able

Table 1. Descriptive statistics

	Means	Std. dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Strategic variation	-1.533	1.352																		
2 Strategic deviation	0.682	0.856																		
3 Board size	11.069	3.028	-0.22	0.16																
4 Market cap. (\$MM ln)	9.835	0.495	-0.13	-0.02	0.15															
5 Company age (yrs)	44.184	34.868	-0.03	-0.04	0.13	-0.06														
6 Tobin's Q	1.834	1.227	-0.04	0.15	-0.01	0.34	-0.10													
7 Industry complexity	0.790	0.233	-0.01	-0.17	0.01	-0.03	0.09	-0.06												
8 Industry munificence	1.028	0.081	-0.19	-0.02	0.19	0.07	0.13	0.00	-0.19											
9 Industry dynamism	1.060	0.039	-0.05	-0.10	0.05	0.11	0.07	-0.02	0.06	0.01										
10 C4 concentration	0.393	0.153	-0.02	-0.12	-0.06	0.03	-0.06	0.00	0.14	-0.11	0.76									
11 Avg. tenure of BoD (yrs)	9.065	3.672	0.06	-0.10	-0.03	0.01	-0.02	0.13	0.07	-0.06	-0.07									
12 CEO industry insider	0.837	0.370	0.06	-0.03	-0.08	-0.04	-0.05	-0.10	0.02	-0.11	0.00	0.08								
13 CEO tenure (yrs)	5.695	6.045	-0.02	-0.04	-0.08	0.06	-0.08	0.13	0.01	-0.03	-0.07	-0.08	0.02	0.05						
14 Average age of BoD	60.076	2.954	-0.03	-0.03	-0.08	-0.08	0.05	-0.05	0.02	-0.05	-0.13	-0.12	-0.02	-0.09						
15 CEO power	1.563	0.845	-0.14	0.37	0.07	0.05	-0.14	0.22	-0.06	0.06	-0.05	-0.11	0.04	-0.09	-0.03	-0.03	-0.03			
16 BCD	0.545	0.370	-0.10	-0.10	-0.24	-0.05	-0.27	0.12	-0.06	-0.09	-0.11	-0.03	0.14	0.06	0.28					
17 BCB	1.181	0.195	0.25	0.30	0.12	-0.05	-0.09	0.02	0.03	0.08	-0.13	-0.07	-0.08	-0.04	0.04	0.17	-0.04			
18 BCD × CEO power	0.951	0.967	0.27	0.11	-0.12	-0.01	-0.13	0.00	0.01	-0.05	-0.15	-0.05	0.02	0.13	0.03	0.10	0.41	0.17		
19 BCB × CEO power	1.904	1.082	-0.22	-0.51	-0.09	-0.08	-0.13	-0.04	0.08	-0.05	-0.06	-0.08	0.00	0.02	0.07	0.02	-0.04	0.18	0.05	

n=236

Correlations above 0.11 are significant at p<0.05

to incorporate into the study. Exponential smoothing allows us to place more significance on the later observations, which presumably reflected the boards' best efforts at strategic resource allocation, incorporating information gained from previous years.

After applying the exponential smoothing technique to each of the resource allocation ratios, we summed them to obtain the composite forecasted strategic variation figure for each firm for 2003. We repeated the exponential smoothing procedure to forecast values for 2004, since boards' effects also appear in the longer term. The absolute value of simple differences representing divergence from historical resource allocation (represented by the number resulting after summing the exponentially smoothed figures) were calculated between the exponentially smoothed, forecasted amount and the actual resource allocation ratios. The result of the procedures were the divergence of the firms' actual resource allocation profiles from the forecasted resource allocation profiles, based on the firms' previous five years of data. In order to normalize the dependent variable, we calculated the natural log of the differences.

Strategic deviation (departure from industry norms) is calculated as the absolute value of the value of the industry norm and the firm's actual resource allocation ratios. We took the following steps to calculate industry norm. First, the 97 industries represented in the sample, based on the focal firm's four-digit SIC code, were collapsed into French's 49 industries (French, 2007). If the firm had multiple SIC codes, we used the code that was linked to the firm's primary line of business based on sales volume. We then identified the top four firms in each of the industries to calculate the composite measure of industry resource allocation norms. The top four firms were selected in each industry based on the commonly used C4 measure of industry concentration (Dobrev, Kim, and Carroll, 2002; U. S. Census Bureau, 2005). C4 is calculated as the average of the top four firms' six sales-weighted resource allocation indicators in the focal firm's primary four-digit SIC industry. The six resource allocation ratios for each industry were summed (Carpenter, 2000) to obtain a composite measure reflecting the industry norm. Divergence from the industry norm was calculated using the absolute value of the differences between the industry norm and the firm's actual resource

allocation ratios. Normality assumptions necessitated the use of the natural log of the difference values.

Independent and moderator variables

Independent variables, board capital breadth and depth, and the moderator variable CEO power were coded using proxy statements of the sample firms.

Board capital breadth and depth

Several indicators are used to capture each dimension of board capital. Board capital breadth is indicated by functional, occupational, and relational heterogeneity and was calculated using Blau's (1977) heterogeneity index. Functional background was captured by the refined taxonomy introduced by Hillman, Cannella, and Paetzold (2000) who categorize directors into one of three board functional roles—business experts, support specialists, and community influentials. Business experts are directors with significant knowledge and expertise in general management. Support specialists include legal experts (e.g., attorneys), finance specialists, (e.g., bankers, venture capitalists, and investment bankers) as well as sales and marketing professionals (e.g., advertising executives). Community influentials include politicians, academics, or other community members who command respect and power in generally nonprofit environments. Occupational background was coded as one of the following categories: general management, finance/accounting, sales/marketing, legal, information systems, operations, engineering, human resources, military/government, and real estate. Heterogeneity of interorganizational linkages was captured by four-digit SIC codes of the directors' interlocked industries.

Board capital depth measures industry embeddedness, depth of linkages to, and expertise in industry. The indicators for this dimension are the ratio of industry interlocks to total interlocks, and industry occupation. Total interlocks were calculated by summing the numbers of board directorships board members hold at other for-profit corporations. Industry interlocks are calculated by first determining the focal firm's main industry using COMPUSTAT's business segment data, then, using two- and four-digit SIC codes, the two coders determined which interlocks were from

within the same industry. The second indicator of board capital depth is the directors' embeddedness in the focal firm's industry through occupation. This was done by calculating the ratio of directors who have current or past experience in the focal firm's main industry to board size. The CEO was excluded from both measures of board capital.

The two ratios composing board capital depth (industry interlock and industry occupation) were then summed to create an index with values from 0 to 2 indicating the board's embeddedness in the focal industry, with higher values indicating higher degree of embeddedness. The measures for board capital breadth were also indexed by summing the individual measures; however, since that dimension has three indicators, the range of values is between 0 and 3, with values close to 3 indicating higher heterogeneity. Cronbach's (1951) alpha for the board capital breadth was 0.649 and for board capital depth, 0.752.

CEO power

Executive power may have multiple sources (Finkelstein, 1992) such as structural power based on organizational structure and hierarchy (Hambrick, 1981), ownership power based on the shareholdings of the manager (Zald, 1969), and expert power originating in the manager's relevant expertise (Mintzberg, 1983). Based on these elements of power findings, several indicators of CEO structural and ownership power are captured in this study: duality (i.e., whether the CEO is also board chair), the ratio of nonaffiliated to total number of directors, the ratio of CEO to board equity holdings of the focal firm, and the ratio of directors who were appointed after the CEO began his or her tenure, to the number of total directors. These variables were standardized and summed to create an index of CEO power. Cronbach's (1951) alpha between these measures was 0.58.

Control variables

Previous empirical findings indicate that firm size, age, and performance are related to strategic change (Mintzberg, 1978). Accordingly, firm size (logarithm of market capitalization), company age (years since incorporation), and performance (Tobin's q) are control variables. Board size (the number of directors) (Goodstein *et al.*, 1994) and the average age of the directors is also included in

the model. Industry complexity, munificence, and dynamism (Dess and Beard, 1984) were included as control variables along with industry concentration (C4). Variables relating to CEO power, including the average tenure of the board, measured as the mean of the directors' tenure on the focal company's board, CEO industry insider status, measured as a dummy variable (Datta *et al.*, 2002), and CEO tenure measured as the number of years the CEO had been the top executive of the focal company were also included since they may affect independent and dependent variables.

Statistical analysis

The main effect of board capital breadth and depth as well as the effect of moderating variable on strategic change were tested using linear regression. Outliers were recoded as the highest values of non-outliers, based on the normal distribution and assumptions were verified that the data meets the requirements of regression analysis. The independent variables and the moderator variable were centered. Variance inflation factors and tolerance are all within acceptable limits for the variables, including the control variables, ranging from 1.036–1.186 and 0.766–0.977 respectively.

Two dependent variable models were tested, one using strategic variation examining the firm's resource allocation decisions after a one-year lag (T1)⁵ and the other to capture strategic deviations between industry norms and firm strategy.

RESULTS

The means, standard deviations, and correlations of variables are reported in Table 1. Board capital breadth and depth are not significantly correlated with one another indicating that they capture different dimensions of the overall board capital construct. Both, however, have a significant positive correlation with CEO power.

Tables 2 and 3 present models of our two dependent variables, strategic variation and strategic deviation, respectively. In each table, Model 1

⁵ Separate regressions were also run on later years (T2–T4) resource allocation models to determine whether board capital depth and breadth have long-term effects.

Table 2. Results of moderated regression of board capital on strategic variation

Variable	Model 1		Model 2		Model 3	
	B	Std. error	B	Std. error	B	Std. error
(Constant)	6.902	4.378	6.628	4.089	4.845	3.720
Board size	-0.084**	0.030	-0.107**	0.028	-0.102**	0.026
Market capitalization (\$MM ln)	-0.252	0.190	-0.230	0.178	-0.286+	0.161
Company age (years)	0.001	0.003	0.000	0.002	-0.001	0.002
Tobin's Q	-0.011	0.076	0.028	0.072	0.036	0.066
Industry complexity	-0.244	0.389	-0.458	0.364	-0.216	0.333
Industry munificence	-2.806*	1.127	-3.179**	1.051	-3.602**	0.959
Industry dynamism	0.159	3.571	1.006	3.347	3.383	3.058
C4 concentration	-0.497	0.923	-0.455	0.867	-1.089	0.792
Board average tenure	0.028	0.024	0.042+	0.023	0.034+	0.021
CEO industry insider	0.087	0.239	0.194	0.225	0.088	0.204
CEO tenure (years)	-0.011	0.015	-0.008	0.014	-0.008	0.012
Board average age	-0.036	0.030	-0.042	0.028	-0.036	0.025
CEO power		-0.240*	0.108	-0.243**	0.099	
BCB		2.255**	0.428	2.253**	0.406	
BCD		-0.469+	0.248	-0.593**	0.252	
BCB × BCD				-3.371**	0.957	
BCB × CEO power				-1.927**	0.560	
BCD × CEO power				1.238**	0.304	
R Square	0.09		0.23		0.37	
Adjusted R square	0.05		0.17		0.32	
R Square change			0.12		0.15	
F change			12.73**		17.15**	

n=236

+ p<0.1

* p<0.05

** p<0.01

Unstandardized coefficients are shown.

includes the control variables, whereas Models 2 and 3 include the independent variables and interaction effects.

Hypothesis 1 tests whether greater board capital breadth is associated with greater strategic change. As indicated by Model 2 in Table 2, board capital breadth has a significant relationship ($p<0.01$) with strategic variation, providing support for Hypothesis 1. Similarly, as Table 3 shows, the relationship between board capital breadth and strategic deviation is also significant ($p<0.01$). Thus, Hypothesis 1 is supported.

Hypothesis 2 suggests greater board capital depth would lessen strategic change. Model 2 (Table 2) shows a marginally significant negative relationship ($p<0.1$) between board capital depth and strategic variation, and Model 2 (Table 3) shows a significant negative relationship ($p<0.01$) with strategic deviation. Thus, our results provide overall support for Hypothesis 2, albeit the support is stronger for deviation than for variation.

Finally, Hypotheses 3a and 3b suggest a moderating effect of CEO power on the earlier relationships. Both interaction effects of CEO power on the board capital breadth and strategic change relationship were significant ($p<0.01$) in support of Hypothesis 3a (Models 3 in Tables 2 and 3). The results indicate that the presence of a powerful CEO weakens the effect of board capital breadth on strategic change. Specifically, Figure 2a illustrates the relationship between board capital breadth and strategic variation under high and low CEO power. The slope of board capital breadth on variation is steeper under low CEO power, indicating that the impact of the board's heterogeneity on departure from past strategic choices is greater when the power of the CEO is less (Jaccard and Turisi, 2003). Thus, in the case of variation (Figure 2a) the effect of CEO power weakens the effect of board capital breadth, while in the case of deviation (Figure 2b) the relationship is reversed. This could indicate that CEOs exert their power on a more diverse board more forcefully with respect

Table 3. Results of moderated regression for board capital and strategic deviation

Variable	Model 1		Model 2		Model 3	
	Beta	Std. error	Beta	Std. error	Beta	Std. error
(Constant)	4.176	2.723	5.020*	2.427	4.603*	1.983
Board size	0.0534**	0.019	0.028	0.017	0.025+	0.014
Market capitalization (ln)	-0.181	0.118	-0.143	0.106	-0.181*	0.086
Company age (years)	-0.001	0.002	0.000	0.001	-0.001	0.001
Tobin's Q	0.127**	0.047	0.080+	0.043	0.069+	0.035
Industry complexity	-0.568*	0.242	-0.660**	0.216	-0.405*	0.178
Industry munificence	-0.826	0.705	-1.193*	0.628	-1.384**	0.515
Industry dynamism	-0.363	2.224	-1.409	1.989	-0.198	1.630
C4 concentration	-0.547	0.573	-0.002	0.514	-0.535	0.421
Board average tenure	-0.015	0.015	-0.013	0.013	-0.017	0.011
CEO industry insider	0.012	0.148	0.148	0.133	0.117	0.109
CEO tenure (years)	-0.008	0.009	0.000	0.008	0.001	0.007
Board average age	-0.007	0.019	-0.003	0.017	-0.003	0.014
CEO power			0.389**	0.064	0.347**	0.053
BCB			0.973**	0.257	1.183**	0.218
BCD			-0.525**	0.148	-0.290**	0.135
BCB × BCD					-1.520**	0.514
BCB × CEO power					-2.991**	0.301
BCD × CEO power					0.079	0.164
R square	0.11		0.31		0.55	
Adjusted R square	0.07		0.26		0.51	
R Square change			0.19		0.25	
F change			21.17**		39.28**	

n=236

* p<0.05

** p<0.01

Unstandardized coefficients are shown.

to industry norms than in the case of a firm's past strategies. Figure 2b illustrates how the impact of board capital breadth on strategic deviation differs under low and high CEO power. The slope of board capital breadth on deviation is positive under low CEO power, indicating that as board capital breadth increases, departure from industry norms also increases. However, when CEO power is high, the slope becomes negative, showing that the preferences of powerful CEOs reverse the effect of board capital breadth in deviation from industry norms. This interaction allows for some speculation regarding the interaction between a heterogeneous board and a powerful CEO with respect to adherence to industry norms.

The main effect of both board capital breadth and CEO power on deviation is positive, indicating that both heterogeneous boards and powerful CEOs prefer to diverge from industry norms. However, in interaction the relationship becomes negative, with heterogeneous boards under very high CEO power increasingly adhering to industry

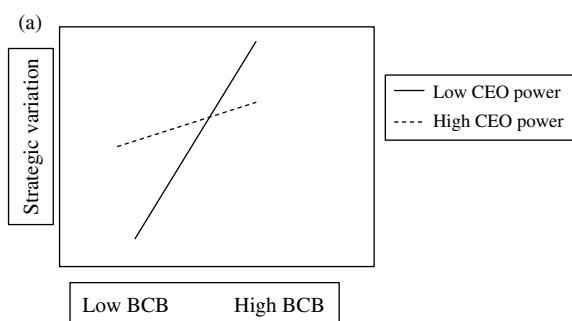


Figure 2a. Moderating effect of CEO power on board capital breadth and strategic variation

norms. This finding runs counter to our logic and is difficult to explain. One potential explanation may reside in a more complex interaction between board capital breadth, CEO power, and CEO tenure or succession. Recent empirical findings by Datta, Rajagopalan, and Zhang (2003) suggest that at the time of succession, a CEO's openness to change may affect post-succession strategic change

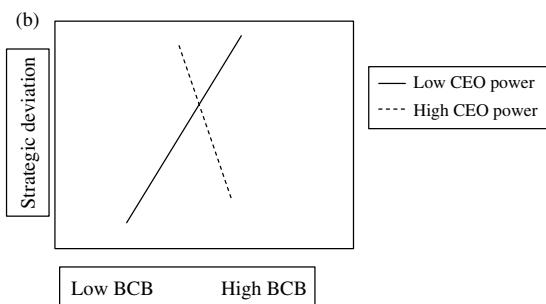


Figure 2b. Moderating effect of CEO power on board capital breadth and strategic deviation

(persistence). Future research is needed to more clearly understand the causal mechanisms at play behind this reversal under conditions of high CEO power.

The other interesting finding about CEO power is the negative main effect on strategic variation. This finding indicates that, *ceteris paribus*, powerful CEOs prefer to keep to the company's strategy, which they likely had a large role in devising. Yet, the main effect of CEO power on deviation is positive, indicating that CEOs prefer to diverge from industry norms, perhaps in an effort to take a path that differs from that of their industry peers.

The interaction effect predicted in Hypothesis 3b of board capital depth and CEO power was not significant for deviation. Surprisingly however, the interaction was statistically significant but in the direction opposite of the predicted for strategic variation (Models 3 in Tables 2 and 3). While these empirical results provide no support for Hypothesis 3b as predicted, the interaction that is statistically significant in the direction opposite our prediction warrants attention. When CEO power is low, the relationship between board capital depth and strategic variation is negative, indicating that as the board becomes increasingly embedded in industry, there is less and less departure from prior firm strategies. Contradictory to our prediction, however, when CEO power is high, the regression slope of board capital depth on variation becomes positive, indicating that the powerful CEO's impact reverses the direction of the board capital depth-variation relationship. The statistically significant moderating effects are plotted in Figures 2a, 2b, and 2c.

In *post hoc* analysis, we also tested long- versus short term-effects of board capital breadth and depth on strategic variation, by examining their

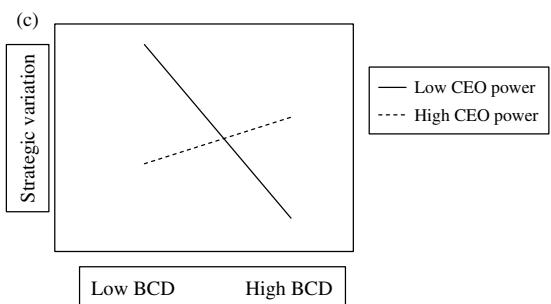


Figure 2c. Moderating effect of CEO power on board capital depth and strategic variation

effect two (T2), three (T3), and four (T4) years out. The results for the relationship between board capital breadth and variation remained unchanged for the time period examined, constantly yielding a positive and significant ($p < 0.05$) relationship. The relationship of board capital depth on variation however, became less and less significant over time, changing from a significance level of 0.12 at T2, to 0.27 in T3, and 0.86 in T4.

DISCUSSION

While a number of research studies examine the effect of boards on strategy (e.g., Goodstein *et al.*, 1994), we focus on the role of board capital as a higher-order construct, with two dimensions relevant to strategic change: board capital breadth and board capital depth. In doing so, we advance a more comprehensive theoretical approach of board capital than does prior research. These dimensions also allow us to examine a much more comprehensive range of board characteristics. We also carefully examine the theoretical constructs of board capital breadth and depth in order to select the correct composition models that best correspond to the theoretical construct. Doing so responds to calls in the literature (Harrison and Klein, 2007; Van Maanen *et al.*, 2007) to ensure that measures of breadth and depth heterogeneity are appropriately assembled.

Our dataset captures several facets of board capital breadth and depth including directors' occupational background, functional background, industry insider/outsider status, as well as industry and nonindustry ties. The comprehensiveness of our measures represents an empirical contribution to the board literature since most research studies of

board composition have relied on relatively few indicators (e.g., occupational background, insider/outside status). We also differentiate our measures from others' through the breadth of industries covered, the significance of the companies included in the dataset, and the generalizability of our dependent variable combined into one study. For example, previous work uses a single industry (hospital) sample (Goodstein *et al.*, 1994; Golden and Zajac, 2001). Goodstein *et al.*'s (1994) study notes that the 'small size of hospitals and high level of involvement of board members in strategic affairs, suggests that these results might apply primarily to small and medium-sized corporations whose boards are similar to hospital boards' (Goodstein *et al.*, 1994: 249). Similarly, by examining the board members embeddedness in the focal firm's industry, our approach differs from Geletkanycz and Hambrick's (1997) study, which examined the industry embeddedness of top executives who were involved in the daily operation of the firm rather than that of the board of directors.

Building on resource dependence theory, we submit that board capital is a useful resource for firms, with the breadth of knowledge, experiences, and social ties providing the opportunity for firms to deviate from both previous strategies and from industry strategic norms. We find support for the role of board capital breadth on strategic variation from historical norms, suggesting more heterogeneous boards are more likely to encourage changes from past strategies. We also find results for the effect of board capital breadth on deviation from industry norms, suggesting more heterogeneous boards are also more likely to encourage strategies that differ from institutional norms. While other researchers find negative relationships between board heterogeneity and strategic change in turbulent environments (Goodstein *et al.*, 1994) and in response to poor performance (Westphal and Bednar, 2005), our more general results point to the ongoing tension between beneficial board diversity and that which decreases response time and/or encourages pluralistic ignorance. Needed are further research models that continue to refine when board diversity can be good and when it can be bad.

We posited further that a board's embeddedness in the firm's focal industry through occupation and interlocking directorates (board capital depth) would limit the degree of variation from previous resource allocation decisions and deviation

from industry central tendencies, or restrict strategic change. While the relationship between board capital depth and variation was only marginally significant, we found support for a negative relationship between board capital depth and strategic deviation. Thus, we find that more embedded boards are less likely to encourage strategies that differ from those of industry competitors and from historical norms, although the latter is based on only marginally significant results.

Finally we maintained that the presence of a powerful CEO moderates the relationships between board capital and strategic change, such that the powerful CEO's preference to remain committed to the *status quo* and industry norms prevail. We find support for the moderating role of CEO power on board capital breadth and strategic variation and deviation, but no support for CEO power as a moderator of board capital depth and strategic change. Thus, when a CEO is powerful, he or she acts to limit the effect of board heterogeneity on both strategic variation and deviation. The CEO's impact on the relationship between board capital depth and strategic change is only noticeable in the case of strategic variation, but in the direction opposite of the predicted. One possible explanation for our findings regarding CEO power is that a powerful CEO might exert his or her power by opposing the board. Thus, if the board recommends one course of action, a powerful CEO might act against this recommendation. This outcome might explain why the prediction of a powerful CEO strengthening the relationship between board capital depth and strategic change was not supported, yet that significant relationship weakening the board capital depth-strategic variation link was detected. Future research is needed to determine how CEO power could influence embeddedness, and specifically why CEO power affects the relationship between board capital breadth and strategic change but not the relationship between board capital depth and change as predicted.

Thus, the current paper has implications for both the study and the practice of board composition. We show that the board's human and social capital matters with respect to firm strategy. The number of board seats is not unlimited, so each director is expected not only to monitor but also to use his or her human and social capital in service of the firm's goals. In the absence of a powerful CEO who might overrule the board, our findings indicate

that more heterogeneity in the human and social capital of the board leads to more strategic change. However, the strategic change in our study can be considered as a more proximal, mediating variable in the board capital-firm performance relationship that was proposed by Hillman and Dalziel (2003).

However, more strategic change is not necessarily beneficial for each firm all the time. Firm performance may benefit from strategic conformity and maintaining the *status quo* if the current strategy works and if the firm operates in a stable industry and economic environment. However, some firms are better off by making changes in their strategy, in particular if their strategy is unsuccessful and if their environment requires them to be nimble. As noted by Zajac, Kraatz, and Bresser's (2000) study on the savings and loan industry, strategic fit and the choice of whether to change strategies or maintain the course depends on environmental and organizational contingencies.

Adding to the dynamic resulting from matching or mismatching environmental and organizational contingencies are the actions of the CEO. Sanders and Hambrick (2007) examine CEOs' risky and uncertain investment behaviors relating to R&D, acquisitions, and capital investments and find that while moderate amounts of stock options were linked to extreme risk taking with balanced losses and gains, very high amounts of stock options led to risky investment behaviors that resulted in more losses than gains. These findings have implications for our study since the board is instrumental in setting CEO compensation and Sanders and Hambrick's (2007) study shows that stock options are an important determinant of risk taking and firm performance. Future research could build on the findings of both Sanders and Hambrick's (2007) study and ours to examine how board capital and CEO stock options impact strategic changes and ultimately, firm performance. Such research could be informative since our study indicates that the board's human and social capital matters in terms of strategic change, which is more proximal than performance, yet is expected to have performance implications.

Our study has limitations as well. As recognized, our adoption of strategic change measures from others may not represent the best context to examine effects of board capital breadth or depth. Yet, examining strategic change, a construct on which the effect of the board's human and social

capital is more easily determined than on performance, is a first step toward testing the model of board capital presented by Hillman and Dalziel (2003). Future research, building on this study, could test the board capital-performance relationship. Another limitation is that in spite of the relatively large number of board capital indicators in the compilation of these measures, we were limited to those characteristics required for disclosure on proxy statements. These demographic variables may not be representative of important underlying differences or similarities among directors. The generalizability of the current study for the post-Sarbanes-Oxley Act period may also be an issue. The proxy data used in this study for the board measures are from 2002, and the strategic change measures have a two-year lag. Since Sarbanes-Oxley, directors have been required to take on a more active role in strategy and monitor the CEO more closely. Thus, it is possible that Sarbanes-Oxley significantly reduces the CEO's power overall, which may have caused the lack of support for our CEO power moderator between board capital depth and strategic change. As a result of the institutional change brought about by Sarbanes-Oxley, it would be worthwhile to investigate what exactly constitutes strategy creation and how much boards truly participate in strategy creation. Despite these limitations, we believe our findings have implications for practice. First and foremost, we hope to raise awareness regarding the important elements of directors' human and social capital that operate at the board level: board heterogeneity (breadth) and industry embeddedness (depth). When boards are searching for new members, it is important that they broadly consider multiple characteristics of potential directors (e.g., skills, industry expertise, external ties, etc.) and how they complement or reinforce existing board breadth and depth. Second, our results indicate that when change is needed or desired for a firm, board capital breadth may encourage variation from a firm's historical norms of behavior and industry norms. Board capital depth, however, discourages deviation from industry norms suggesting the greater a board's embeddedness in the industry, the less likely the firm is to change. Thus, matching the needs of the firm with the breadth of directors' human and social capital is an important implication for practice.

REFERENCES

- Bantel KA, Jackson SE. 1989. Top management and innovations in banking: does the composition of the top team make a difference? *Strategic Management Journal*, Summer Special Issue **10**: 107–124.
- Becker GS. 1964. *Human Capital*. Columbia University Press: New York.
- Blau PM. 1977. *Inequality and Heterogeneity: A Primitive Theory of Social Structure*. Free Press: New York.
- Boyd BK. 1990. Corporate linkages and organizational environment: a test of the resource dependence model. *Strategic Management Journal* **11**(6): 419–430.
- Boyd BK. 1994. Board control and CEO compensation. *Strategic Management Journal* **15**(5): 335–344.
- Burrell G, Morgan G. 1979. *Sociological Paradigms and Organizational Analysis*. Heinemann: London, UK.
- Business Roundtable. 2005. *Principles of Corporate Governance*. Business Roundtable: Washington, DC. Available at: <http://www.businessroundtable.org/sites/default/files/CorporateGovPrinciples.pdf> (accessed 9 June 2009).
- Carpenter MA. 2000. The price of change: the role of CEO compensation in strategic variation and deviation from industry strategy norms. *Journal of Management* **26**: 1179–1198.
- Carpenter MA, Westphal JD. 2001. The strategic context of external network ties: examining the impact of director appointments on board involvement in strategic decision making. *Academy of Management Journal* **44**: 639–660.
- Chan D. 1998. Functional relations among constructs in the same content domain at different levels of analysis: a typology of composition models. *Journal of Applied Psychology* **83**: 234–246.
- Child J. 1972. Organization structure and strategies of control: a replication of the Aston study. *Administrative Science Quarterly* **17**: 163–177.
- Coleman JS. 1988. Social capital in the creation of human capital. *American Journal of Sociology* **94**: S95–S120.
- Cronbach LJ. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika* **16**: 297–334.
- Daily CM, Dalton DR. 1993. Board of directors leadership and structure: control and performance implications. *Entrepreneurship Theory and Practice* **17**(3): 65–81.
- Dalton DR, Daily CM, Johnson JJ, Ellstrand AE. 1999. Number of directors and financial performance: a meta-analysis. *Academy of Management Journal* **42**: 674–686.
- Dalton DR, Kesner IF. 1987. Composition and CEO duality in boards of directors: an international comparison. *Journal of International Business Studies* **18**: 33–42.
- Datta DK, Guthrie JP, Rajagopalan N. 2002. Different industries, different CEOs? A study of CEO career specialization. *Human Resource Planning* **25**(2): 14–25.
- Datta DK, Rajagopalan N, Zhang Y. 2003. New CEO openness to change and strategic persistence: the moderating role of industry characteristics. *British Journal of Management* **14**: 101–114.
- Dess GG, Beard DW. 1984. Dimensions of organizational task environments. *Administrative Science Quarterly* **29**: 52–73.
- Dobrev SD, Kim T-Y, Carroll GR. 2002. The evolution of organizational niches: U. S. automobile manufacturers, 1885–1981. *Administrative Science Quarterly* **47**: 233–264.
- Eisenhardt KM. 1989. Agency theory: an assessment and review. *Academy of Management Review* **14**: 57–74.
- Eisenhardt KM, Bourgeois LJ. 1988. Politics of strategic decision making in high-velocity environments. *Academy of Management Journal* **32**: 543–576.
- Eisenhardt KM, Kahwajy JL, Bourgeois LJ. 1997. Conflict and strategic choice: how top management teams disagree. *California Management Review* **39**(2): 42–62.
- Eisenhardt KM, Schoonhoven CB. 1990. Organizational growth: linking founding team strategy, environment, and growth among U. S. semiconductor ventures, 1978–1988. *Administrative Science Quarterly* **35**: 504–529.
- Finkelstein S. 1992. Power in top management teams: dimensions, measurement, and validation. *Academy of Management Journal* **35**: 505–538.
- Finkelstein S, D'Aveni RA. 1994. CEO duality as a double-edged sword: how boards of directors balance entrenchment avoidance and unity of command. *Academy of Management Journal* **37**: 1079–1108.
- Finkelstein S, Hambrick DC. 1990. Top management team tenure and organizational outcomes. *Administrative Science Quarterly* **35**: 484–503.
- French K. 2007. *Data Library*. http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html (accessed 1 Jan. 2007).
- Geletkanycz MA, Hambrick DC. 1997. The external ties of top executives: implications for strategic choice and performance. *Administrative Science Quarterly* **42**: 654–681.
- Golden BR, Zajac EJ. 2001. When will boards influence strategy? Inclination \times power = strategic change. *Strategic Management Journal* **22**(12): 1087–1111.
- Goodstein J, Gautam K, Boeker W. 1994. The effects of board size and diversity on strategic change. *Strategic Management Journal* **15**(3): 241–250.
- Grossman W, Cannella AA Jr. 2006. The impact of strategic persistence on executive compensation. *Journal of Management* **32**: 257–278.
- Halebian J, Finkelstein S. 1993. Top management team size, CEO dominance, and firm performance: the moderating roles of environmental turbulence and discretion. *Academy of Management Journal* **36**: 844–863.
- Hambrick DC. 1981. Environment, strategy, and power within top management teams. *Administrative Science Quarterly* **26**: 253–275.
- Hambrick DC, Geletkanycz MA, Fredrickson JW. 1993. Top executive commitment to the *status quo*: some tests of its determinants. *Strategic Management Journal* **14**(6): 401–418.

- Harrison DA, Klein KJ. 2007. What's the difference? Diversity constructs as separation, variety or disparity in organizations. *Academy of Management Review* **32**: 1199–1228.
- Henderson AD, Fredrickson JW. 1996. Information-processing demands as a determinant of CEO compensation. *Academy of Management Journal* **39**: 575–606.
- Hillman AJ, Cannella AA Jr, Paetzold RL. 2000. The resource dependence role of corporate directors: strategic adaptation of board composition in response to environmental change. *Journal of Management Studies* **37**: 235–256.
- Hillman AJ, Dalziel T. 2003. Boards of directors and firm performance: integrating agency and resource dependence perspectives. *Academy of Management Review* **28**: 383–396.
- Hofer CW, Schendel D. 1978. *Strategy Formulation: Analytical Concepts*. West: St. Paul, MN.
- Huff AS. 1982. Industry influences on strategy reformulation. *Strategic Management Journal* **3**(2): 119–131.
- Jaccard JJ, Turisi R. 2003. *Interaction Effects in Multiple Regression*. Sage: Thousand Oaks, CA.
- Jackson SE, May KE, Whitney K. 1995. Understanding the dynamics of diversity in decision making teams. In *Team Effectiveness and Decision Making in Organizations (J-B STOP Frontiers Series)*, Guzzo RA, Salas E (eds). Jossey-Bass: San Francisco, CA; 204–261.
- Jensen M, Zajac EJ. 2004. Corporate elites and corporate strategy: how demographic preferences and structural position shape the scope of the firm. *Strategic Management Journal* **25**(6): 507–524.
- Johnson RA, Hoskisson RE, Hitt MA. 1993. Board of director involvement in restructuring: the effects of board vs managerial controls and characteristics. *Strategic Management Journal*, Summer Special Issue **14**: 33–50.
- Judge WQ Jr, Zeithaml CP. 1992. Institutional and strategic choice perspectives on board involvement in the strategic decision process. *Academy of Management Journal* **35**: 766–794.
- Kozlowski SWJ, Klein KJ. 2000. A multilevel approach to theory and research in organizations: contextual temporal and emergent processes. In *Multilevel Theory, Research and Methods in Organizations: Foundations, Extensions, and New Directions*, Klein KJ, Kozlowski SWJ (eds). Jossey-Bass: San Francisco, CA; 3–90.
- Miller CC, Burke LM, Glick WH. 1998. Cognitive diversity among upper-echelon executives: implications for strategic decision processes. *Strategic Management Journal* **19**(1): 39–58.
- Milliken FJ, Martins LL. 1996. Searching for common threads: understanding the multiple effects of diversity in organizational groups. *Academy of Management Review* **21**: 402–433.
- Mintzberg H. 1978. Patterns in strategy formation. *Management Science* **24**: 934–948.
- Mintzberg H. 1983. *Power In and Around Organizations*. Prentice-Hall: Englewood Cliff, NJ.
- Mizruchi MS, Stearns LB. 1994. A longitudinal study of borrowing by large American corporations. *Administrative Science Quarterly* **39**: 118–140.
- Nahapiet J, Goshal S. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review* **23**: 242–266.
- Pennings JM. 1980. *Interlocking Directorates*. Jossey-Bass: San Francisco, CA.
- Pfeffer J, Salancik GR. 1978. *The External Control of Organizations: A Resource Dependence Perspective*. Harper & Row: New York.
- Prahalad CK, Bettis RA. 1986. The dominant logic: a new linkage between diversity and performance. *Strategic Management Journal* **7**(6): 485–501.
- Priem RL, Lyon DW, Dess GG. 1999. Inherent limitations of demographic proxies in top management team heterogeneity research. *Journal of Management* **25**: 935–953.
- Rajagopalan H, Spreitzer G. 1997. Toward a theory of strategic change: a multi-lens perspective and integrative framework. *Academy of Management Review* **22**: 48–79.
- Sanders WG, Hambrick DC. 2007. Swinging for the fences: the effects of CEO stock options on company risk taking and performance. *Academy of Management Journal* **50**: 1055–1078.
- Scherer F. 1980. *Industrial Market Structure and Economic Performance*. Houghton Mifflin: Boston, MA.
- Spender J. 1989. *Industry Recipes: Nature and Sources of Managerial Judgment*. Blackwell: Oxford, UK.
- Stiles P. 2001. The impact of the board on strategy: an empirical examination. *Journal of Management Studies* **38**: 627–650.
- Stiles P, Taylor B. 2001. *Boards at Work: How Directors View Their Responsibilities*. Oxford University Press: Oxford, UK.
- U. S. Census Bureau. 2005. *Establishment and Firm Size: 2002*. U. S. Department of Commerce, Economics and Statistics Administration: Washington, DC (Issued Nov. 2005).
- Van Maanen JV, Sørensen JB, Mitchell TR. 2007. The interplay between theory and method. *Academy of Management Review* **4**: 1145–1153.
- Westphal JD, Bednar MK. 2005. Pluralistic ignorance in corporate boards and firms' strategic persistence in response to low firm performance. *Administrative Science Quarterly* **50**: 262–298.
- Whetten DA. 1989. What constitutes a theoretical contribution? *Academy of Management Review* **14**(4): 490–495.
- Wiersema MF, Bantel KA. 1992. Top management team demography and corporate strategic change. *Academy of Management Journal* **35**: 91–121.
- Williams KY, O'Reilly CA. 1998. Demography and diversity in organizations: a review of 40 years of research in research. In *Research in Organizational Behavior* (Vol. 20), Staw BM, Sutton RI (eds). JAI Press: Greenwich, CT; 77–140.
- Zahra SA, Pearce JA II. 1989. Boards of directors and corporate financial performance: a review and

- integrative model. *Journal of Management* **15**: 291–334.
- Zajac EJ, Kraatz MS, Bresser RKF. 2000. Modeling the dynamics of strategic fit: a normative approach to strategic change. *Strategic Management Journal* **21**(4): 429–453.
- Zald MN. 1969. The power and function of boards of directors: a theoretical synthesis. *American Journal of Sociology* **75**: 97–111.
- Zhang Y, Rajagopalan N. 2003. Explaining new CEO origin: form versus industry antecedents. *Academy of Management Journal* **46**: 327–338.