

**The Upper-Echelon Perspective of Firm Competitive Behavior: Empirical
Evidence from the U.S. Pharmaceutical Industry**

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Abstract

How firms compete for an advantage is among the most critical questions in Business Strategy. While several researchers link executives to key strategic outcomes, much less is understood on how the Upper-Echelon team drives the actual competitive behavior of the firm, which is manifested in the launching of observable and purposeful competitive actions within the marketplace.

Considering that competitive behavior research tends to overlook the importance of human assets, in general, and executive human assets, in particular, I explore how the knowledge, skills, and abilities of the Chief Executive (CEO), Top Management Team (TMT), and Board of Directors (BOD) impact a firm's competitive behavior. In addition, I examine how sources of Social Capital, or the relationships between these Upper-Echelon actors, influence a firm's competitive behavior. Moreover, I argue and test for the moderating influence of executive compensation on firm competitive behavior.

Applying relational demography to capture Human Capital and sources of Social Capital within the U.S. Pharmaceutical Industry, I find some empirical support that executives do, indeed, affect firm competitive behavior. Overall, the empirical evidence indicates that the Human Capital of the CEO, TMT, and BOD can influence all dimensions of a firm's Competitive Intensity. Unexpectedly and, contrary to prediction, executive dissimilarity (not similarity) tended to greatly influence a firm's Competitive Activity and Repertoire Complexity. Also, the moderating impact of executive bonus and incentive pay was largely supported.

This dissertation contributes to both the competitive behavior and Upper-Echelon literatures. Notably, this dissertation adds to the very limited work that attempts to theoretically link and empirically test for executive impact on firm competitive behavior. By so doing, it begins to open the "black box" on how human assets at the Upper Echelon affect strategic outcomes through a firm's competitive behavior.

Dedication

I dedicate this dissertation to my immediate family members who demonstrated abundant love, unwavering support, and incredible understanding as I progressed through this doctoral program. Without all three of these ingredients, I would have been unable to complete this requirement for the doctoral degree. Beginning with the Commander-In-Chief of the Offstein household, I dedicate this dissertation to my wife, Laura. I can hardly think of more difficult circumstances for a family to undergo this experience. In addition to serving as a wonderful Mom, you also fulfilled the role of Dad when I could not. During this time, you served tirelessly as a parent, spouse, and also as mentor to the Virginia Tech Corps of Cadets. Equally important, you served with incredible distinction for the U.S. Army after September 11th on a project much more important than anything that I will present in the next 250 pages. You will never know the respect and admiration that I have for you. Next, I dedicate this dissertation to my two daughters—Madison and Molly. These two wonderful girls provided smiles when I was angry, laughter when I was frustrated, and unconditional love when I most needed it. As tears run down my face as I type these words, I want you to know that we have plenty of missed fun to make up for. I love my two girls—Madison and Molly!

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As I left the Virginia Military Institute in 2000, a faculty member from their Department of Management approached me and offered one piece of advice. COL West told me to first surround myself with good people and to, next, surround myself with competent people. I took that advice to heart and that is why I am able to write this paragraph today. I would like to first acknowledge the support cast who helped this “value chain”. A special thanks goes to Manish Srivastava who provided friendship, intellectual capital, and sweat equity to this venture. A note of deep gratitude also goes to Michael Orticari who performed yeoman’s work in the data collection phase of this dissertation. I would also like to thank Kumar, Eric Cartaya, and Jenn Oyler for their collegial support as I progressed through the doctoral program. Karen Poe and Dr. Kent Murrmann also provided administrative and, at times, tactical advice that allowed me to miss several landmines that I was approaching fast and unaware. I would also like to thank Dr. Donald Hatfield who inspired me to think critically. A special thanks is also extended to Steve Childers who provided me friendship and a place to stay on my return trips down to Tech. It is important to also note the work of Terry Tannacito, who provided editing support above and beyond my highest expectations. I would also like to acknowledge my parents who taught me early on the importance of hard work.

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1.0 INTRODUCTION

Competition is critical to Business Strategy audiences who attempt to understand and predict how firms can gain a market advantage and attain better than average returns. Despite the centrality of competition within Business Strategy, relatively little is still known on exactly how firms compete through purposeful, specific, and observable moves (Chen, 1996; Smith, Ndofor, & Ferrier, 2001).

A firm's competitive behavior, which reflects the moves or actions a firm launches to gain a competitive advantage in the marketplace (Offstein, Gnyawali, & Srivastava, 2003; Gnyawali, Offstein, & Srivastava, 2003), is important theoretically (Chen, 1996; D'Aveni, 1994; Gnyawali & Madhavan, 2001) and empirically (Ferrier, 2001; Miller & Chen, 1996; Smith *et al.*, 1991) because it is linked to a firm's financial performance. Several researchers have attempted to identify and understand factors that drive a firm to launch competitive moves (Chen, 1996; Chen & Hambrick, 1995). To date, theory and empirical testing have focused on three broad drivers of a firm's competitive behavior: market-related factors (Chen, 1996; Miller & Chen, 1994), rival firm actions or characteristics (Smith *et al.*, 1991), and characteristics or resources of the focal firm (Chen & Hambrick, 1995; Hambrick, Cho, & Chen, 1996) or of its network partners (Gnyawali & Madhavan, 2001).

Understanding how firm characteristics and internal firm resources impact competitive behavior holds special appeal since firm resources tend to be under managerial control, and, as a result, can be manipulated or altered to improve a firm's competitive position. To date, the majority of empirical research into firm resources as drivers of a firm's competitive behavior has

focused almost exclusively on aspects of the firm that are unlikely to provide a sustained competitive advantage. These include organizational size (Chen & Hambrick, 1995), organizational age (Miller & Chen, 1994; 1996), and organizational slack (Ferrier, 2001). Thus, more emphasis on valuable, rare, non-substitutable, and inimitable organizational drivers of competitive behavior should be welcomed, as these are the factors believed to deliver a sustainable competitive advantage (Barney, 1991).

Scholars argue that a firm's resource advantage begins with its people (Barney, 1991; Coff, 1997; Lee & Miller, 1999; Lepak & Snell, 1999). Importantly, organizations differ on the amount of Human Capital and Social Capital that they can deploy to achieve strategic outcomes (Coleman, 1988; Leana & Van Buren, 1999; Pennings, Lee, & Arjen van Witteloostuijn, 1998). High levels of Human Capital connote a firm knowledge and skill advantage that can influence the chances of firm survival (Pennings *et al.*, 1998). Implicit in this link between managerial Human Capital and firm survival is the theme that managerial knowledge, skills, and abilities improve key managerial processes. These processes, such as decision-making and information processing, influence the competitive posture of a firm. Thus, a more direct theoretical and empirical investigation into the Human Capital to competitive behavior relationship is warranted.

High levels of Social Capital within a firm mean that the organization effectively uses the relationships between people to attain firm goals (Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). Social capital can be deployed to make a firm more operationally efficient, as well as more creative and innovative (Leana & Van Buren, 1999). Social capital can also increase the amount of knowledge created within a firm (Leana & Van Buren, 1999). Despite the importance and potential influence of Social Capital on key organizational processes and

outcomes, there is little understanding of exactly how and to what extent Social Capital impacts a firm's competitive behavior.

The spirit of this study is to begin to develop the idea of intensity of firm competitive behavior. Firms that are competitively intense launch a high volume of complex and forceful moves or actions. Competitively intense firms are more likely to become leaders within their markets. Moreover, a firm's intense competitive behavior weakens the resolve and response abilities of rival firms. Accordingly, competitively intense firms are in a better position to gain a competitive advantage in the marketplace reflected in better-than-average firm performance.

1.1 RESEARCH QUESTIONS

The following are my research questions:

- 1) If and to what extent does a firm's Human Capital influence the firm's Competitive Intensity as reflected in the propensity, complexity, and magnitude of actions that a firm launches?
- 2) If and to what extent does a firm's Social Capital influence the firm's Competitive Intensity?
- 3) To what extent does executive compensation moderate the relationship between a firm's Human and Social Capital and a firm's Competitive Intensity?
- 4) To what extent does a firm's Competitive Intensity impact firm performance?

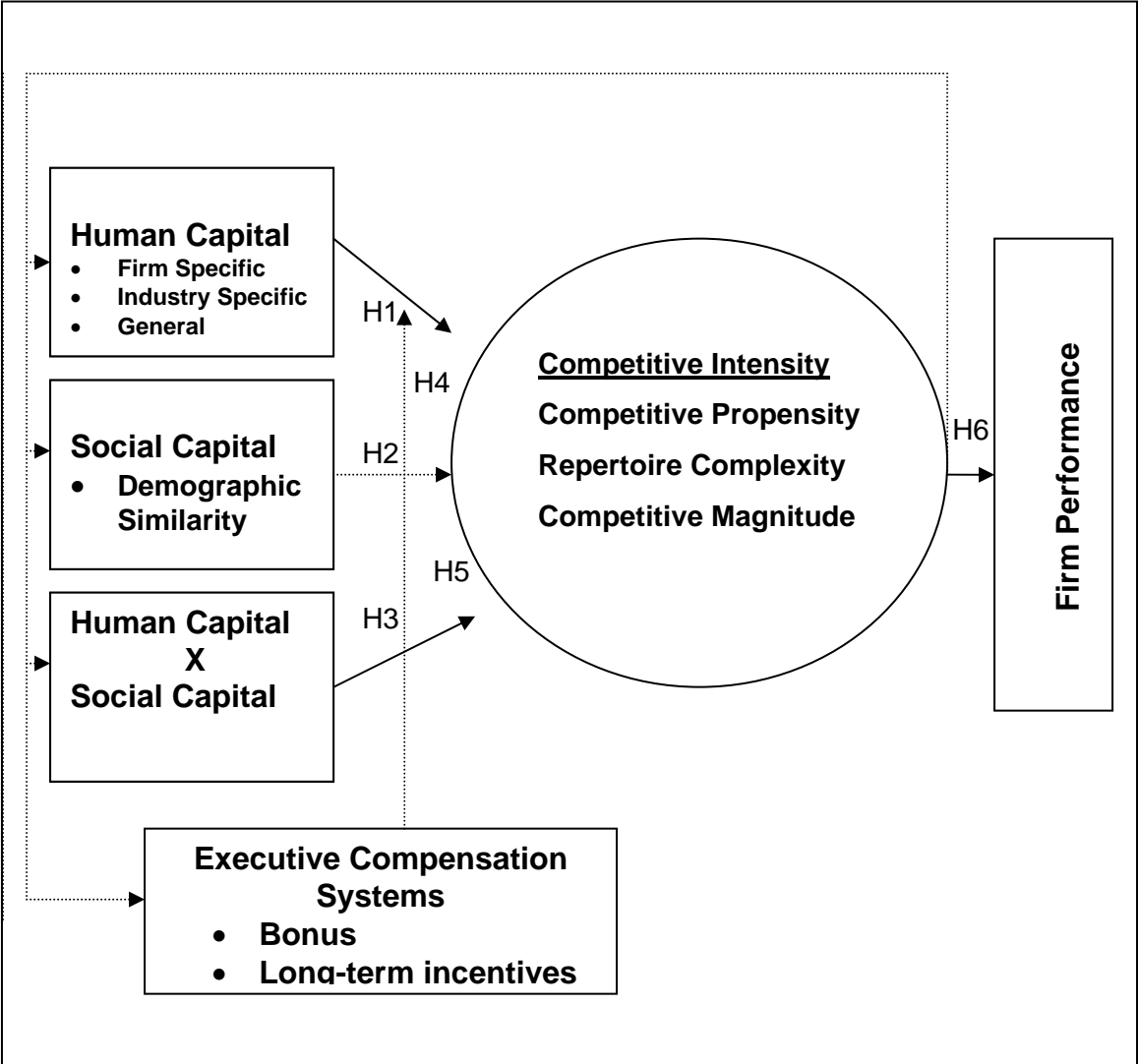


Figure 1.1. The Upper-Echelon model of firm Competitive Intensity.

1.2 CONCEPTUAL MODEL

Figure 1.1 advances the Upper-Echelon perspective of competitive behavior. Accordingly, it captures the hypothesized direct effects between executive Human and Social Capital and a firm’s competitive behavior. Because both quantity and quality of actions are important in securing a competitive advantage (Hambrick *et al.*, 1996), the model accounts for

the volume, variety, and force of actions or moves under the proposed umbrella-construct term of Competitive Intensity. The model also illustrates competitive outcomes that arise from the interaction of a firm's Human and Social Capital. Since executive compensation can motivate senior managers (Gomez-Mejia & Balkin, 1992) and can help align values between agents and principals (Eisenhardt, 1989), senior management pay moderates the relationship between a firm's Human and Social Capital and a firm's Competitive Intensity. This moderating relationship is particularly important because Human Capital can become unmotivated, lose their commitment towards the firm, or choose to leave the organization (Coff, 1997). Similarly, trusting and rich relationships can be used for personal benefit only; Social Capital can then differ in the degree that relationships are leveraged to achieve firm, versus personal, outcomes (Leana & Van Buren, 1999).

Since this dissertation is an initial attempt to examine the impact of Human and Social Capital on a firm's competitive behavior, I will focus on the strategic partners that comprise the Upper-Echelon leadership of a firm (i.e., Top Management Team (TMT), the Chief Executive Officer (CEO), and the Board of Directors (BOD)). This choice of analysis is commonsensical given that prior research has linked these assets to strategic firm outcomes and a firm's financial performance (Daily & Johnson, 1997; Finkelstein, 1992).

It is important to note that the Upper-Echelon perspective of firm Competitive Behavior that I offer here is different from Hambrick and Mason's (1984) Upper-Echelon perspective. Conceptually and empirically, I emphasize other key strategic assets other than the TMT, such as the CEO and the BOD. Also, Hambrick and Mason (1984) suggest that background managerial characteristics can partially predict key strategic outcomes and performance since prior experiences shape mental models and influence important processes such as strategic decision

making. Although I use some background characteristics to test the model, the Upper-Echelon perspective I present here emphasizes executive Human Capital and the Social Capital shared between executives as drivers of firm competitive behavior. It is also important to note that this dissertation builds on prior work by Hambrick *et al.*, (1996) who argue that TMT heterogeneity influences a firm's competitive actions and responses. Whereas Hambrick *et al.*, (1996) emphasize only the TMT and differences among TMT members, this dissertation builds on their work by also examining the CEO and the BOD. In addition, this dissertation extends their research by more closely examining trait demographic effects and, by also, investigating differences between, not within, the firm strategic partners of the CEO, BOD, and TMT.

1.3 CONTRIBUTIONS

Below I highlight some of the theoretical and empirical contributions of this dissertation.

Development and Testing of the Upper-Echelon Theory of Competitive Behavior.

Currently, there are two prominent theory pieces within the competitive behavior field. These key pieces have emphasized market commonality and resource similarity (Chen, 1996) or network properties and resources of firms as antecedents of competitive behavior (Gnyawali & Madhavan, 2001). These theories predict that resource similarities between rival firms (Chen, 1996) and resources accessible through or provided by network partners drive a firm to launch competitive moves (Gnyawali & Madhavan, 2001). In general, these perspectives stress the role of resources or resource differences that influence a firm's competitive behavior. The Upper-Echelon perspective developed in this dissertation differs in two key manners. First, the Upper-Echelon perspective highlights resources internal to the firm as drivers of a firm's competitive behavior. Second, these resources arise from key Human assets and the relationships that exist

among these assets. Thus, the Upper-Echelon perspective stresses human assets and relationships that are unique, valuable, non-substitutable, and inimitable resources that can powerfully and creatively drive the behavior of the firm.

Dynamic Setting. The use of the U.S. pharmaceutical industry provides an interesting and technology rich backdrop in which to examine firm competitive behavior. In addition, there is evidence that this industry rewards firms that are innovative, creative, risk-seeking, and knowledge-based (Powell, Koput, & Smith-Doerr, 1996). This industry also stresses managerial and research talent as much or more than traditional forms of capital (Lisa Steptoe, personal conversation, 3 March). The use of this setting may also increase the external validity of previous competitive behavior findings that are based on the U.S. airline industry. While these studies provide strong footing on which the field can build, investigating other samples and other settings can inform and improve our understanding of the competitive phenomenon.

Improved Understanding of how Human Factors Contribute to Strategic Firm Processes and Outcomes. Currently, most of the prior research on competitive behavior has overlooked the importance of human-based resources. Instead, traditional forms of capital, such as organizational size or slack, have been studied. The Upper-Echelon perspective proposes and then empirically tests the worth of key human assets and the relationships between these assets as drivers of a firm's competitive behavior. Indeed, this study is among the first to theoretically and empirically use Organizational Social Capital theory to predict firm competitive behavior. This approach toward competitive behavior then is leveraged on managerial skills and abilities, such as information-processing, decision-making, and innovation that only human assets can provide to a firm. Several scholars have reoriented competitive behavior research towards this

agenda by asking that future research investigate the strategic choice of a firm (Child, 1972) to engage in competitive moves (Smith *et al.*, 2001).

Chief Executive Officer & Board of Directors (BOD). This study will be among the first to examine the CEO, the BOD, and the relationship between them as drivers of a firm's competitive behavior. Given the rising importance of governance within the strategy literature and the fact that neither the CEO nor director effects on competitive behavior have been researched (Cutting & Kouzmin, 2000), this appears to address both applied and scholarly calls to understand the impact that these strategic human assets have on firm outcomes.

2.0 LITERATURE REVIEW

In this chapter, I set out to achieve several goals. First, I outline why research in competitive dynamics, in general, and competitive behavior, in particular, is important. Second, I briefly review research in an organized fashion to illustrate what has been learned about competitive behavior. Third, I examine other key constructs within this study: Human Capital, Social Capital, and executive compensation. Similarly, I review the importance and predictive capacity of these constructs.

2.1 COMPETITIVE DYNAMICS AND THE DISTINCTION BETWEEN DYNAMICS AND BEHAVIOR

A competitive action, the most elemental unit in competitive dynamics research, is a purposefully directed, specific, and observable move launched by a firm to enhance its competitive position (Chen, 1996; Chen, Smith, & Grimm, 1992; Ferrier *et al.*, 1999). It is important to discern between an action and an event. An event is something that happens; it lacks free will, purpose, and motivation. In contrast, a competitive action or move causes something else to happen as a result of purposeful intentions (Grimm & Smith, 1997). A purpose of a competitive move may be to recapture market share. The loss of a research and development facility due to a fire would be an event as the focal firm had no control over the loss. Compare that with a firm that purposefully closes a facility to consolidate and centralize R&D functions. Since this move has purpose and intent, it would qualify as an action—not an event.

Competitive dynamics can be traced back almost a full century to the writings of Schumpeter. Schumpeter (1934) argued that a firm achieving a first-mover advantage would generate abnormally high profits, causing rival firms to attack this market leader in an effort to overtake its position. Also recognized as a “perennial gale” or “creative destruction,” it was believed that rival firms would aggressively pursue creative actions to dethrone the market leader. The study of competitive dynamics was advanced when several researchers (e.g., Chen & Hambrick, 1995; Ferrier, Smith, & Grimm, 1999; Young, Smith, & Grimm, 1996) linked Schumpeter’s views with that of Austrian economics (Jacobsen, 1992). Unlike their neo-classical counterparts, Austrian economists view the competitive landscape as anything but static. Rather, they view markets as dynamic and continuously jolted out of equilibrium by forceful actions of competing firms within those markets (Jacobsen, 1992). Competitive dynamics, then, is primarily concerned with the action and response moves that firms launch over a period of time to out-compete rival firms within similar markets (Smith *et al.*, 2001).

Central to competitive dynamics research are several pivotal assumptions. These assumptions are important as they help distinguish between the competitive dynamics and competitive behavior research streams. The key competitive dynamics assumption is that competition is interactive and highly interdependent. Simply, it takes two or more firms to compete as a focal firm will competitively engage only when provoked by a rival firm within the same or similar market (Chen, 1996; Chen & MacMillan, 1992; Smith *et al.*, 1991; Smith *et al.*, 2001). When competition is viewed in this manner, it is difficult to separate competitive action from competitive response as all actions are believed to be tied tightly to a previous move by a rival firm. Reacting to the competitive moves of others is then a key tenet of competitive dynamics.

The pivotal difference between competitive dynamics and behavior research is that competitive behavior research examines firms' moves in greater detail without focusing on responses and countermoves of rivals. Competitive behavior researchers examine factors that drive a firm's competitive moves and, in turn, create competitive advantage. Said differently, there are other factors besides the characteristics of rival firms and their responses that cause a firm to behave in a specified way. For instance, Offstein and colleagues (2003) provide some empirical evidence that internal factors, such as how executives get paid, can drive firm actions. Moreover, the size of an organization has been among the most potent predictors of a firm's competitive behavior (Chen & Hambrick, 1995). Competitive behavior tends to examine firm resources that may drive and direct the competitive moves of a firm. To conclude, competitive behavior researchers tend to focus on firm characteristics, rather than rival or rival action characteristics, as drivers of competitive moves. Table 2.1 summarizes the differences between competitive dynamics and behavior.

Table 2.1

Differences between Competitive Dynamics and Behavior

Competitive Dynamics Research	Competitive Behavior Research
<ul style="list-style-type: none"> • Competitive response is an important construct • Action characteristics and rival firm characteristics cause a focal firm to respond • Sequencing and order of actions and response are captured and measured • Actions and responses are episodic in nature; captured over and across time • Emphasis is on interdependence between focal and rival firms 	<ul style="list-style-type: none"> • Focus is on actions (does not discern whether a move is a response) and the factors that drive these actions • Emphasis is on firm resources or firm characteristics of a focal firm as drivers of competitive moves • Sequencing and order of actions is not captured (snapshot of competitive posture rather than a competitive episode)

2.2 THE IMPORTANCE OF COMPETITIVE BEHAVIOR

From a theoretical standpoint, understanding competitive behavior is valuable. For instance, Mintzberg (1973) early on noted that it is not what a firm says, but, rather, what it does that should be associated with Business Strategy. Along this line, some argue that a firm’s strategy emerges through a pattern of firm actions (D’Aveni, 1994; Mintzberg, 1973; Smith *et al.*, 2001). Thus, to fully understand a firm’s strategy, one must examine a firm’s specific competitive moves. In addition, when a researcher captures the competitive behavior of a firm, he or she is, in essence, opening the “black box” of how firms actually execute strategy and achieve competitive advantage. Whereas much of strategy literature examines static variables to

static outcomes, competitive behavior research can be a more precise and dynamic approach to understanding Business Strategy.

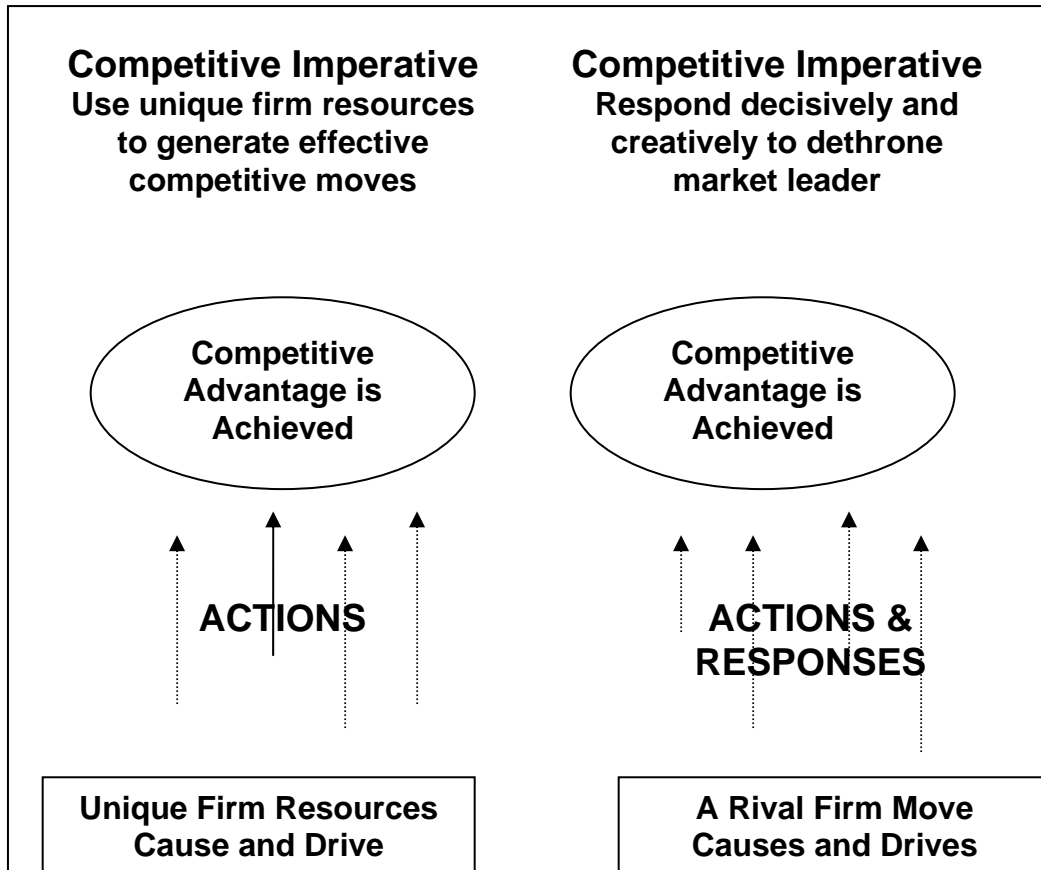


Figure 2.1. Competitive behavior vs. competitive dynamics.

2.2.1 Competitive Advantage

The central question in Business Strategy is how firms achieve better-than-average returns. Accordingly, the drive behind much of strategy research is to identify and understand how firms achieve a competitive advantage. I use Figure 2.2 below to explain the three mainstream perspectives of competitive advantage and how competitive behavior borrows from and fits among these perspectives.

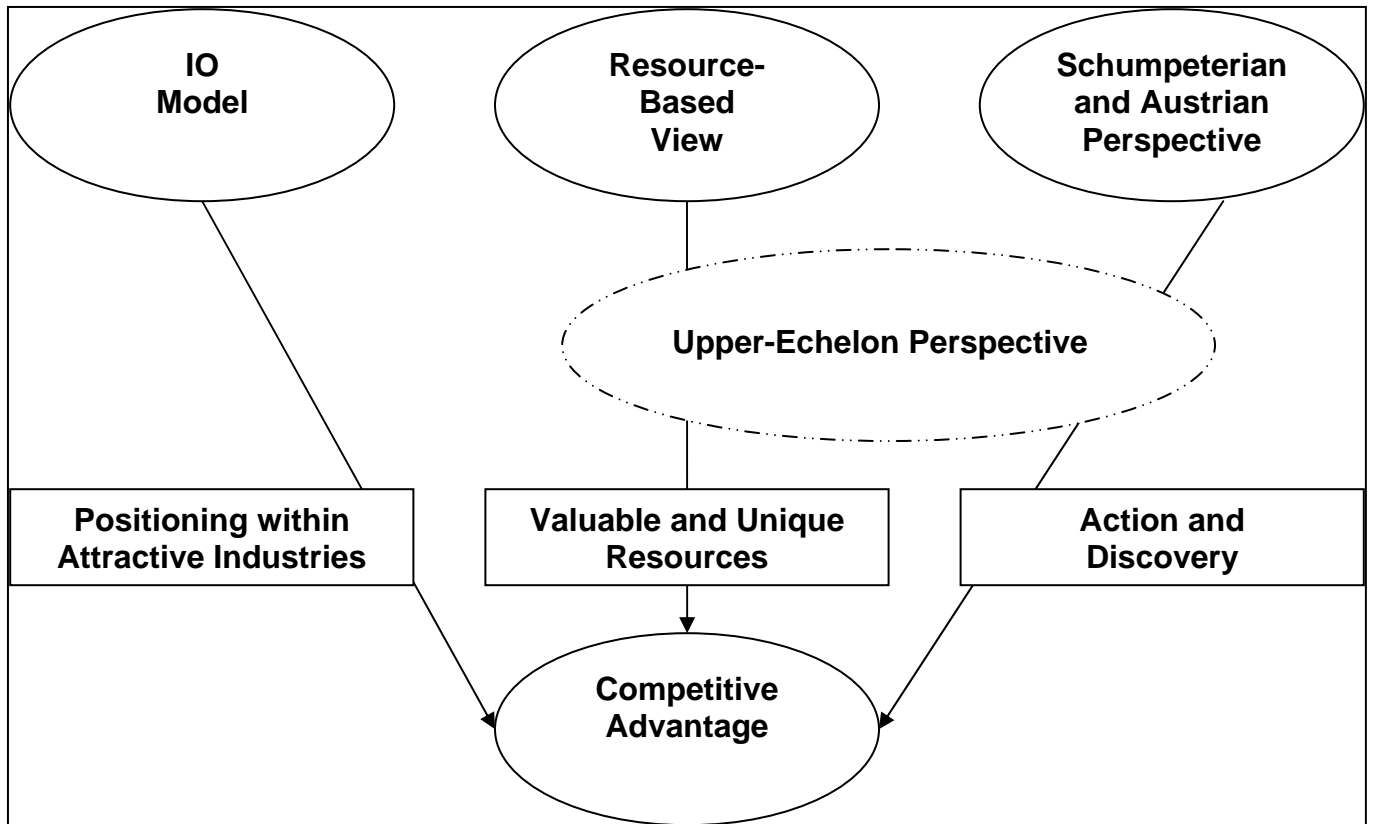


Figure 2.2: Views of competitive advantage.

In the Industrial Organization Economics (IO Model), competitive advantage is primarily gained by exploiting industry structure (Porter, 1980). Firms gain an advantage by positioning themselves within a competitive environment with certain characteristics. Namely, Porter’s five forces model suggests that firms should choose markets where there are weak suppliers and buyers, high barriers to entry, and few substitute products (Porter, 1980). The five forces model is an environmentally driven model that is particularly useful in identifying attractive industries and positioning within those industries. However, one of the main drawbacks of this model of competitive advantage is that it does not clearly specify what actions or strategies firms should adopt once positioned (Grimm & Smith, 1997). In addition, this perspective assumes that firms

exist within market equilibrium and that competitive advantage is sustainable (D'Aveni, 1994). Also, this view highlights industry events (e.g., increased demand for a new drug) as opposed to firm actions.

The resource-based view of the firm is one of the more recent perspectives of competitive advantage. The premise behind the resource-based view is that internal firm resources determine a firm's competitive advantage (Barney, 1991). Not all resources, however, qualify as drivers of a competitive advantage. Resources must be valuable, rare, imperfectly imitable, and non-substitutable (Barney, 1991). Oddly, the resource-based view of the firm tends to emphasize factors that preserve a competitive advantage—not how firms actually act or behave to create a competitive advantage in the first place. For instance, resources are deemed more valuable to the extent that they demonstrate causal ambiguity and social complexity (Barney, 1991). Again, the premise is not on what these resources can do, per se, but, rather, on what they prevent—duplication from rival firms. Porter (1991: 108) neatly summarizes the theoretical limitations of the resource-based view when he remarks, “Resources are not valuable in and of themselves, but because they allow firms to perform activities that create advantages in particular markets.” The Upper-Echelon perspective of competitive behavior addresses this theoretical shortcoming by more clearly specifying how a firm's internal human resources perform competitive activities that result in a market advantage.

The final perspective is the Schumpeterian view. Most research in competitive dynamics is rooted in this perspective of competitive advantage. This view contends that firms gain advantage through entrepreneurial discovery and aggressive competitive action and response (Schumpeter, 1934; Grimm & Smith, 1997). Linked tightly with Austrian economic theory, this perspective is borne “out of the logical implications of the fact that human beings engage in

purposeful action” (Grimm & Smith, 1997: 36). For Austrian economists, discovery and actions are the result of managers and entrepreneurs who seize on market opportunities that arise from market disequilibrium and differing levels of information (Grimm & Smith, 1997; Jacobson, 1992). To Schumpeterians and Austrian economists, profits do not arise from market positioning (e.g., Porter, 1980), but rather are generated by discovery and action.

Describing these three perspectives reveals critical theoretical blind-spots. Namely, the IO perspective minimizes internal firm resources. Next, the resource-based perspective is argued to gain a firm advantage but fails to address exactly how firms achieve this advantage and how these firm resources drive firm activity. Finally, the Schumpeterian view emphasizes discovery and action, but tends not to offer predictions on how a firm can generate more entrepreneurial discoveries and actions. The Upper-Echelon perspective of competitive behavior attempts to reconcile shortcomings in the resource-based and Schumpeterian views of competitive advantage. Specifically, it accounts for the unique human-based resources that cause a firm to competitively engage in a particular manner.

In summary, while some recent attention emphasizes firm resources as drivers of a firm’s competitive behavior, most of the previously studied resources are not human-based. The Upper-Echelon perspective of competitive behavior builds on limited, but important, prior empirical work (Hambrick *et al.*, 1996) to blend both the resource-based view of the firm and Schumpeterian/Austrian perspectives on competition to understand how a firm gains a competitive advantage.

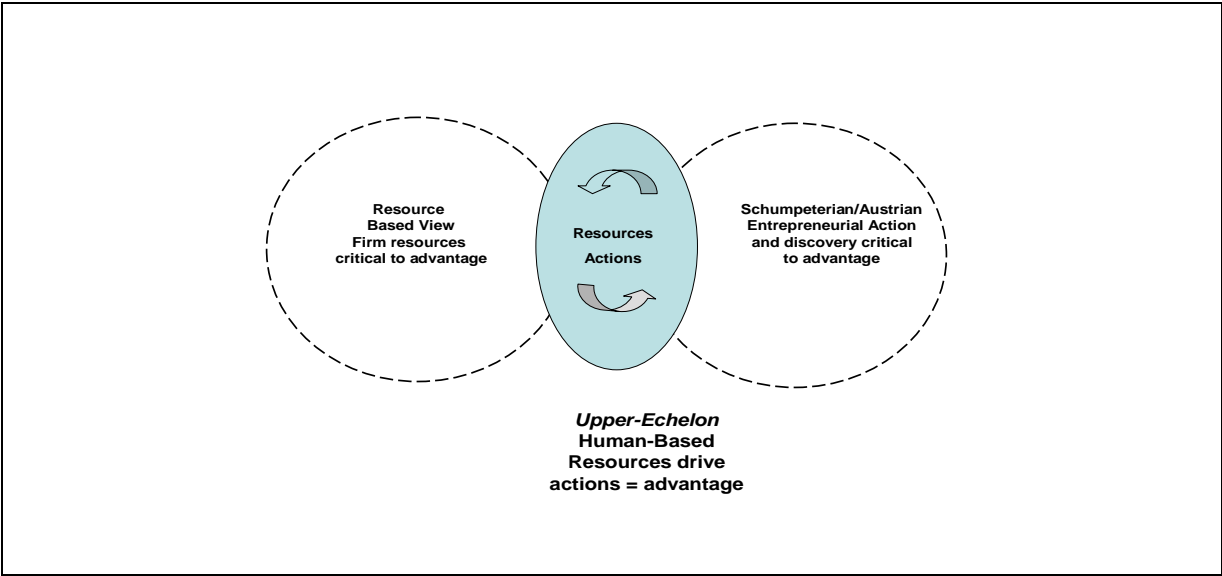


Figure 2.3. Blending the two perspectives to arrive at the Upper-Echelon Perspective.

In the Table 2.2 below, I summarize the major performance findings that link competitive moves with performance. Note that, with few exceptions, much of the performance findings are confined to the U.S. Airline Industry.

Table 2.2

Competitive Behavior and Performance

Citation	Comments/ Inferences
Chen & Hambrick (1995)	Links from all main independent variables to performance were negligible. However, advanced statistical testing illustrated that “to perform well, small and large airlines should follow typical behavior for their groups and that failure to do so will erode performance” (p. 472). The main inference here is institutional theory—deviating significantly from norms of behavior hurts performance.
Chen & Miller (1994)	Strong correlations exist between a firm’s response ratio and individual and factor measures of performance. Main performance conclusion-“that in order to succeed organizations must avoid being retaliated against” (95).
Ferrier (2001)	The strongest performance relationships were between attack volume and attack duration: the greater the duration and volume of moves, the more market share gain.
Ferrier, Smith & Grimm (1999)	Market leaders that carried out more total actions experienced lower market share erosion and were less likely to be dethroned as the market leader. Market leaders that were slow in responding to a challenger experienced more market share erosion and dethronement. Results were less strong but still supportive of action repertoire simplicity. The more simplistic the repertoire by the leader, the greater the erosion of market share and the more likely that dethronement would occur.

Table 2.2 continued

Citation	Comments/ Inferences
Smith et al., (1991)	There was a positive, but marginally significant, relationship between response likelihood and profitability and a negative relationship between response order and profitability. Contrary to the hypothesis, as response lag increased, profits increased. Response imitation was unrelated to profits.
Young, Smith, & Grimm (1996)	Firm performance increases as competitive firm activity increases, but declines as the intensity of competitor rivalry in the industry increases. This study is significant because it uses a different industry sample--the U.S. computer software industry.
Lee, Smith, Grimm, & Schomburg (2000)	Early and fast movers achieve greater gains than late and slow movers and first movers suffer at the time of new product innovations. Study is unique because it examines long distance telecommunications, personal computer, and brewery industries from 1975 to 1990.
Miller & Chen (1994)	Actions committing resources to major projects or significant changes in policy seem to erode short-term performance. Said differently, engaging in strategic actions hurt short-term performance. Inertia is most damaging to airlines facing markets characterized by a diverse set of customer needs and competitive challenges. Thus, performance implications seem to be dependent on both actions and competitive context.
Miller & Chen (1996)	Competitive simplicity was followed by falling performance and by low levels of performance. Simplicity was more harmful to firm performance during intervals of market growth than during periods of decline or stagnation.

In an effort to better understand the magnitude of competitive behavior to performance outcomes, I outline the specific measures, correlations, sample sizes, and setting for these major studies. These are presented in Table 2.3 below.

Table 2.3

Correlations Between Competitive Behavior and Performance Measures

Study	Independent Variable	Measure of Independent Variable	Dependent Performance Variable	Measure of Dependent Variable	Correlation/Sample Size
Chen & Hambrick (1995)	Propensity for Action	Total number of initiated in a given year by its total number of routes in the same year	Performance Index	Single performance index score consisting of net market share change and profit margin	-.25/28 Airline (396 actions/responses)
Chen & Hambrick (1995)	Action execution speed	Average amount of time that a firm spent to execute an announced action	Performance Index	Single performance index score consisting of net market share change and profit margin	-.35/28 Airline
Chen & Hambrick (1995)	Action visibility	Number of lines in <i>Aviation Daily</i> devoted to reporting an action when it first was made public	Performance Index	Single performance index score consisting of net market share change and profit margin	.07/28 Airline
Chen & Hambrick (1995)	Responsiveness	Tendency to respond when attacked	Performance Index	Single performance index score consisting of net market share change and profit margin	.05/28 Airline
Chen & Hambrick (1995)	Response announcement speed	Average amount of time it took a firm-relative to other responding competitors-to announce an intended response to an action	Performance Index	Single performance index score consisting of net market share change and profit margin	.44/16 Airline
Chen & Hambrick (1995)	Response execution speed	Average amount of time a firm took to execute a response	Performance Index	Single performance index score consisting of net market share change and profit margin	-.25/16 Airline
Chen & Hambrick (1995)	Response visibility	Number of lines in <i>Aviation Daily</i> devoted to reporting a response when it first was made public	Performance Index	Single performance index score consisting of net market share change and profit margin	-.10/16 Airline

Table 2.3 continued

Study	Independent Variable	Measure of Independent Variable	Dependent Performance Variable	Measure of Dependent Variable	Correlation/Sample Size/Setting
Chen & Miller (1994)	Response ratio	Summation of all competitive responses directed towards the actions of a given firm in a given year, and expressed as a proportion of the total number of actions made by that firm in that year	Operating revenue per revenue passenger mile (RPM)	Operating revenue per revenue passenger mile	-.17/112 Airline (780 actions/222 responses)
Chen & Miller (1994)	Response ratio	Same as above	Operating profit per RPM	Operating profit per RPM	-.33/112 Airline
Chen & Miller (1994)	Response ratio	Same as above	Profit margin	Profit Margin	-.30/112 Airline
Chen & Miller (1994)	Response ratio	Same as above	S&P Stock rating	S&P Stock rating	-.23/112 Airline
Ferrier (2001)	Attack volume	Average number of competitive action events composing each of a focal firm's competitive attacks in a given year	Market share	Positive year to year change in the percentage of total sales	.12/224 Multi-industry
Ferrier (2001)	Attack duration	Number of days elapsed from first action in a given attack to the last action of the attack	Market share	Positive year to year change in the percentage of total sales	.15/224 Multi-industry
Ferrier (2001)	Attack complexity	Herfindahl/Blau type of index	Market share	Positive year to year change in the percentage of total sales	.04/224 Multi-industry
Ferrier (2001)	Attack unpredictability	Optimal matching logarithm to measure the extent to which firm's sequence of events was or was not similar to previous attacks sequences	Market share	Positive year to year change in the percentage of total sales	-.04/224 Multi-industry

Table 2.3 continued

Study	Independent Variable	Measure of Independent Variable	Dependent Performance Variable	Measure of Dependent Variable	Correlation/Sample Size
Ferrier (2001)	Attack heterogeneity	Optimal matching logarithm that compares the degree of similarity between attacks carried out by focal and rival firms	Market share	Positive year to year change in the percentage of total sales	-.01/224 Multi-industry
Ferrier et al., (1999)	Total competitive activity	Total number of newly created competitive actions	Market share erosion	Logarithm of ratio of leader's market share to challenger's market share	-.11/41 Multi-industry
Ferrier et al., (1999)	Action repertoire simplicity	Herfindahl index that assessed the degree to which a firm carried out a concentrated repertoire of competitive actions	Market share erosion	Logarithm of ratio of leader's market share to challenger's market share	.18/41 Multi-industry
Ferrier et al., (1999)	Action timing	Time elapsed, in days, between the date of a competitive action carried out by leader and the response of the challenger	Market share erosion	Logarithm of ratio of leader's market share to challenger's market share	.15/41 Multi-industry
Miller & Chen (1994)	Competitive inertia	Index capturing the change or alteration of competitive moves compared to previous deployment of competitive moves	Revenue per available seat mile flown	Revenue per available seat mile flown	.33/41 Airline (963 total actions/responses)
Miller & Chen (1996)	Competitive Concentration	Index score that assessed how much a firm concentrated on a few set types of actions	Passenger operating revenue per available seat mile flown	Passenger operating revenue per available seat mile flown	.21/18 Airline

Table 2.3 continued

Study	Independent Variable	Measure of Independent Variable	Dependent Performance Variable	Measure of Dependent Variable	Correlation/Sample Size
Miller & Chen (1996)	Competitive range	Number of different types of actions that a given firm launches in a given year	Passenger operating revenue per available seat mile flown	Passenger operating revenue per available seat mile flown	.33/18 Airline (891 actions)
Miler & Chen (1996)	Competitive dominance	Index score that assessed to what degree a firm relied on a single type of action	Passenger operating revenue per available seat mile flown	Passenger operating revenue per available seat mile flown	.14/18 Airline (891 actions)
Smith et al., (1991)	Response imitation	Degree to which a response imitated an action	Net profit after taxes divided by total revenue	Net profit after taxes divided by total revenue	-.01/104 Airline
Smith et al., (1991)	Response likelihood	Number of times each airline responded to competitors' actions during a given year and dividing that figure by the number of times the firm had an opportunity to respond	Net profit after taxes divided by total revenue	Net profit after taxes divided by total revenue	.13/104 Airline
Smith et al., (1991)	Response lag	Amount of time it took a firm to respond to a competitor's action	Net profit after taxes divided by total revenue	Net profit after taxes divided by total revenue	.11/104 Airline
Smith et al., (1991)	Response order	The rank positioning time of a responding firm among all responders	Net profit after taxes divided by total revenue	Net profit after taxes divided by total revenue	-.20/104 Airline
Young et al., (1996)	Competitive activity	Annual sum of each firm's moves	Return on Assets	Return on Assets	.22/345 Computer
Young et al., (1996)	Competitive activity	Annual sum of each firm's moves	Return on Sales	Return on Sales	.24/345 Computer

From this collection of studies, I identified instances where two or more studies employed like variables and measures of competitive behavior and firm performance constructs. In cases where similarity existed, I formed a simple weighted average of the zero order correlations and a weighted standard deviation to best understand the magnitude of the competitive behavior relationship across studies.

There were five instances where competitive activity or volume was correlated with different measures of firm performance. These studies are: Ferrier (2001), Chen & Hambrick (1995), Ferrier *et al.*, (1999), and Young *et al.*, (1996). In the Young *et al.*, (1996) study, two separate measures of performance were used. The simple weighted average of these zero order correlations examining variants of competitive volume or activity and distinct performance measures were .18. The weighted standard deviation for these correlations across these five instances was .131. Although Cohen (1988) is hesitant to offer thresholds or categorizations reflecting large, medium, and small effect sizes, he does suggest that effect sizes using correlations around the .2 range fall between what most consider a small and medium effect. Pedhazur and Schmelkin (1991) are equally clear that small effect sizes must be considered within contextual boundaries. For instance, they suggest that small effects can become big effects if accumulated over time.

There were eight instances where some variant of complexity of firm competitive behavior was correlated with different measures of firm performance. These studies include: Ferrier (2001), Ferrier *et al.*, (1999), Miller & Chen (1994), Miller & Chen (1996). The simple weighted average of these zero order correlations examining variants of competitive complexity and distinct measures of organizational performance were .03. The weighted standard deviation for these correlations across these studies was .138.

Based on these simple computations regarding effect size, some themes emerge. Correlations, themselves, are simple indicators of effect sizes (Pehdazur & Schmelkin, 1991). Of the 29 correlations displayed in Table 2.3 only five of the correlations exceed .25. Conversely, 13 of the 29 correlation coefficients were at .15 below. One can take the coefficient of determination, or the square of r , to assess the amount of variance that is shared between these measures of these variables. At the high end, competitive activity measures share approximately 5% of the variance with performance measures. At the low end, small correlations and/or negative correlations suggest that these measures do not share any variance with performance measures. Notably, the volume of competitive moves, measured by some variant of total activity, appears to have a stronger magnitude or influence over firm performance than complexity of moves. Also, the low standard deviations highlight that there is not much variability surrounding these effect sizes across studies.

2.3 CHARACTERIZING A FIRM'S COMPETITIVE REPERTOIRE

Table 2.4 highlights dimensions, variables, and measures common to the competitive behavior research. A competitive repertoire is defined as a collection of moves or acts over time.

Table 2.4

Variables of Study in Competitive Behavior

Citation	Construct or Variable	Definition	Measured
Miller & Chen (1996)	Competitive simplicity	Tendency of some firms to concentrate intensely of a few central activities	By Action 1) Concentration 2) Range 3) Dominance (Not indexed into single score)
Miller & Chen (1994)	Competitive inertia	Level of activity that a firm exhibits when altering its competitive stance	By "activity index"
Chen & Miller (1994)	Attack subtlety	The dimensions of a competitive attack that warrant rival attention and response	By Action 1) Visibility 2) Response difficulty 3) Market centrality associated with a given action (Not indexed into single score)
Chen & MacMillan, 1992; Chen & Hambrick, 1995; Smith et al., (1991)	General response	Answering a rival firm action with a competitive move	Can be measured or studied by 1) Likelihood of non-response 2) Response delay 3) Likelihood of matching response 4) Response execution speed 5) Response announcement speed 6) Response lag 7) Response order
Chen & Hambrick (1995)	General action	Launching of specific, purposeful, and directed moves	Can be measured or studied by 1) Propensity for action 2) Action execution speed 3) Action visibility
Hambrick, Cho, & Chen (1996)	Action propensity	Competitive aggressiveness of a firm	Total number of actions a firm launched in a given year
Hambrick, Cho, & Chen (1996)	Action magnitude	The significant investment of fixed and human assets embedded in an action	Can be measured or studied by 1) action significance 2) action noteworthiness 3) action scope (not indexed or aggregated into a single score)

This review is important because it illuminates how competitive constructs have been developed over the past decade. In conclusion, this research stream can be categorized as

relatively new, dominated by a small core set of researchers, and primarily based on a U.S. Airline data set from the late 1970's to mid 1980's.

2.4 PREDICTORS OF A COMPETITIVE MOVE

Since firms that compete well often enjoy better performance (Ferrier, 2001), there is interest in understanding the antecedents and predictors of a firm's competitive behavior. There are three broad determinants leading to a firm's competitive moves: action characteristics of rivals, market factors, or internal firm resources and firm characteristics. Since the Upper-Echelon perspective of competitive behavior is primarily concerned with firm resources that drive a firm's competitive moves, I restrict my review to previous works that examine firm characteristics or resources as predictors of competitive moves.

Below in Table 2.5 is a representation of some of the more common firm characteristics or resources believed to influence the competitive behavior of an organization. For all future tables in Chapter 2, unless otherwise noted, an asterisk represents statistical significance at the .05 level or higher.

Table 2.5

Summary of Firm Characteristics as Predictors of Competitive Moves

Citations	Firm Characteristics	Sample	Correlations
Chen & Hambrick (1995)	Firm Size	Airline	1) -.44* with action propensity 2) -.36* with action execution speed 3) .34* with action visibility
Miller & Chen (1994)	Firm Size	Airline	1) -.53* with inertia
Hambrick, Cho, & Chen (1996)	Firm Size	Airline	1) .61* with action propensity 2) -.15* with action scope 3) -.08 NS with action significance 4) -.01 NS with action noteworthiness 5) Used as control variable here
Hambrick, Cho, & Chen (1996)	TMT Size	Airline	1) .61* with action propensity; 2) -.08 NS with action significance; 3) -.01 NS with action noteworthiness; 4) -.15* action scope
Hambrick, Cho, & Chen (1996)	Average Education of TMT	Airline	low and non-significant correlations except with action scope -.17*
Hambrick <i>et al.</i> (1996)	Average Firm Tenure of TMT	Airline	.17* with propensity and .17* with action scope
Hambrick <i>et al.</i> (1996)	Functional Heterogeneity of TMT	Airline	1) -.11NS with propensity 2) .09 NS with action significance 3) -.04 NS with noteworthiness 4) .08 NS with scope
Ferrier (2001)	Composite Measure of TMT Heterogeneity (education, tenure, functional background)	Multi-Industry Sample	1) -.06NS with attack volume 2) .10 NS with attack complexity 3) low and non-significant correlations and betas with other variables
Hambrick <i>et al.</i> (1996)	Educational Background Heterogeneity	Airline	1) -.02 NS with propensity 2) .06 NS with action significance 3) -.07 NS with noteworthiness 4) -.08 NS with scope
Ferrier (2001)	Organizational Slack	Multi-Industry Sample	1) .21* with attack volume 2) -.19* with attack complexity
Miller & Chen (1994)	Firm Age	Airline	1) -.48* with inertia
Miller & Chen (1996)	Firm Age	Airline	1) -.26* with concentration element of simplicity 2) -.21 NS with dominance index of simplicity 3) -.44* with range index of simplicity

This detailed examination of several key empirical works closely corresponds with recent commentaries on competitive behavior research (Smith *et al.*, 2001). Specifically, little research

examines the role of human factors in the competitive process. In fact, only one work to date exclusively examines executive Human Capital as a predictor of firm competitive behavior (Hambrick *et al.*, 1996). Other pieces examine the role of senior management, but do so in a more tangential manner. For instance, Smith *et al.*, (1991) use industry tenure of the TMT as one measure of an organization's information-processing capability. Unfortunately, when senior management variables are included as predictors, their explanatory power is extremely low. In particular, TMT heterogeneity has not been convincingly linked to a firm's competitive behavior evidenced by the low correlations and betas in the studies performed by Ferrier (2001) and Hambrick and colleagues (1996). Of all TMT variables studied to date, the ones with the greatest predictive power appear to be average education level and firm tenure of the executive team (Hambrick *et al.*, 1996). Little is known about these variables since they were included as control variables without any theoretical support or underpinnings. In fact, the first time they are identified is within the correlation table itself. The authors do, however, acknowledge that these variables "merit further study" (Hambrick *et al.*, 1996: 678). The correlations from the study are reproduced below in Table 2.6.

Table 2.6

Summary of Human Factors as Predictors of Competitive Moves

<i>TMT Variable</i>	<i>Dependent Variable</i>	<i>Correlation</i>
TMT firm tenure	Propensity	.17*
TMT firm tenure	Significance	.05
TMT firm tenure	Noteworthiness	.07
TMT firm tenure	Scope	-.17*
TMT education level	Propensity	-.02
TMT education level	Significance	-.04
TMT education level	Noteworthiness	-.01
TMT education level	Scope	-.17*

Three other observations need to be made here. First, non-human firm characteristics, such as age, slack, and, in particular, organizational size tend to overshadow human factors as predictors of a firm's competitive behavior evidenced by both the existence of relationships (statistical significance) and the strength of those relationships (correlations and betas). It is important to note that effect sizes are not often reported. I have tabulated in Table 2.6 below some indicators of strength of relationship from the two studies that examine firm characteristics as either control or independent variables. It is difficult to discern the additional predictive power of each individual variable, in cases, as a single R^2 was reported—not a change in R^2 . In other words, the R^2 reported reflects the influence of an omnibus model.

Table 2.7

Examples of Predictors and Effect Sizes

Predictor Variables of Competitive Response (Smith et al., 1991)	Predictor Variables of Repertoire Complexity (Miller & Chen, 1996)
Proportion of responses to strategic actions	Prior market performance
External orientation	Firm size
Structural complexity	Firm age
Absorbed slack	Market diversity
Unabsorbed slack	Market growth
Management years of education	Market uncertainty
Management years of experience [industry]	
Variance Explained	Variance Explained
ADJUSTED R ² = .19 (Response Imitation) ADJUSTED R ² = .22 (Response Likelihood) ADJUSTED R ² = .23 (Response Lag) ADJUSTED R ² = .21 (Response Order)	ADJUSTED R ² = .46 (Concentration Index) ADJUSTED R ² = .25 (Dominance Index) ADJUSTED R ² = .61 (Range Index) ADJUSTED R ² = .45 (Composite Simplicity Index)

Second, studies examining the interactive or moderating relationships of variables are uncommon in competitive behavior research. Although exceptions do exist (e.g., Miller & Chen, 1996), interactive or joint effects have yet to be fully explored in regard to human factors. This omission may be quite meaningful as some TMT researchers note that static executive traits must be included with other key variables, especially process-oriented variables, to fully capture the predictive power of executive dynamics (Smith, Smith, Olian, Sims, O'Bannon, & Scully, 1994). Third, competitive behavior research fails to look at other key human assets, such as the Chief Executive Officer (CEO) or Board of Directors (BOD), as drivers of competitive moves. Since these human actors are believed to affect strategic outcomes (Daily & Johnson, 1997;

Mace, 1971; Pfeffer, 1973), there is a research imperative to begin exploring how these human assets can affect the competitive behavior of a firm.

In summary, several studies examine firm characteristics as determinants to a firm's competitive moves. However, fewer studies examine the contribution of human factors to a firm's competitive behavior. Furthermore, when these few human factors are benchmarked against inanimate or static variables, they tend to offer less prediction. Given the theoretical importance of human factors coupled with the predominant use of an industry that may more fully utilize traditional forms of capital and, consequently, limit executive choice and discretion (Hrebiniak & Joyce, 1985), a deeper, more comprehensive, and contextual understanding of the human drivers of competitive behavior is needed.

2.5 HUMAN CAPITAL

Human Capital is the stock of skills, knowledge, and resources that tend to exist within a person (Becker, 1962; Buchholtz, Ribbens, & Houle, 2003). Some other definitions of this construct add an individual's expertise, innovativeness, and flexibility (Berkowitz, 2001). Accordingly, education, training, and experience are the most used measures of Human Capital (Berkowitz, 2001; Hitt *et al.*, 2001). While there is general recognition that Human Capital is a valuable resource to a firm, some argue that not all forms of Human Capital are of equal value to the firm (Lepak & Snell, 1999). Along those lines, firms tend to value Human Capital based on the specificity of that capital. An individual can possess Human Capital specific to the firm or specific to a given industry (Berkowitz, 2001; Buccholtz *et al.*, 2003; Wernerfelt, 1984).

2.5.1 Human Assets: A Unique Form of Capital

Human Capital is both similar and unique when compared to traditional or fixed forms of capital. To begin with, Human Capital investments are like other capital investments in that they involve transferring resources from the present into the future (Febrero & Schwartz, 1995). Like other forms of capital, Human Capital should be considered an input into the production process (Coff, 2002). Unlike other forms of capital, however, Human Capital has mobility and can move quickly out of the firm (Berkowitz, 2001). Further, Human Capital differs from other forms of capital because it can reject authority, can become unmotivated, and is not under continuous control by the organization (Coff, 1997). Whereas physical capital is remarkably similar among firms within an industry, Human Capital is more likely to demonstrate variance among industries and among firms (Coff, 2002). Also, physical capital tends to depreciate with use. In contrast, Human Capital does not have a predictable rate of depreciation and may even appreciate with use (Adler & Kwon, 2002). In a similar vein, measuring Human Capital and the outputs of Human Capital are more difficult than measuring other forms of capital (Adler & Kwon, 2002; Berkowitz, 2001).

2.5.2 Human Capital and the Organization

The role of the organization towards the protection and use of Human Capital is particularly intriguing. D'Aveni (1994) argues that safeguarding a firm's Human Capital is essential because time and competition can erode Human Capital. Firms, however, can intervene to protect, and even enhance, their Human Capital. For instance, Amit and Schoemaker (1993),

Barney (1991), and Reed and DeFillipi (1990) all study how organizations can resist the decay of Human Capital. This can be done by improving skills or by making human capabilities more unique (Lepak & Snell, 1999). Specifically, Nonaka (1994) urges organizations to routinely expose their key leaders to the environment to allow mental maps to be questioned and challenged. It is here, Nonaka (1994) believes, that Human Capital is enhanced through learning and knowledge creation. Human Resource researchers, such as Lepak and Snell (1999), note that organizational policies, and Human Resource systems in particular, can enhance the value of Human Capital by making it more socially complex, more causally ambiguous, and more reliant on tacit-type knowledge. Incidentally, firm-specific Human Capital tends to be made, not bought on the open labor market (Lepak & Snell, 1999), and many believe that truly unique capabilities and resources can only be attained through internal firm development (Lepak & Snell, 1999).

Human Capital is of strategic value because it contributes to a firm's competitive advantage by improving firm efficiency and effectiveness (Barney, 1991; Porter, 1985; Ulrich & Lake, 1991). In particular, the literature appears to link Human Capital closely with the learning based view of the firm (Kogut & Zander, 1992; Grant, 1996) because of the knowledge and skills that comprise an individual's Human Capital. Interestingly, there is scant mention of Human Capital in the competitive behavior literature. This absence is puzzling given the importance of decision-making (Smith *et al.*, 2001), strategic choice (Smith *et al.*, 2001), information processing (Smith *et al.*, 1991), and learning (D'Aveni, 1994) that are believed central to firm competition.

2.5.3 Executive Forms of Human Capital

The case for building the bridge between Human Capital and competitive behavior is more tenable after viewing how Human Capital could affect other important strategic outcomes. I organize some previous research surrounding what is considered the strategic human assets of a firm (e.g., the Top Management Team, the Chief Executive Officer, and the Board of Directors) (Hambrick & Mason, 1984; Daily & Johnson, 1997; Westphal & Zajac, 1995)

2.5.3.1 Executive Influence and Human Capital

Beginning with Cyert and March's (1963) behavioral view of the firm, the stock of the Top Management Team has risen. In the most global of senses, the behavioral view of the firm suggests that firms are not purely economic decision entities. Rather, the behavior, cognitions, and choices of a firm's dominant coalition within the organization are of critical importance in steering the direction and activity of a firm. It is this dominant coalition that commands the firm's resources and information flow within a firm. The Upper-Echelon perspective builds upon the behavioral view of the firm (Hambrick & Mason, 1984) and is widely cited because of two primary reasons. First, it theoretically argues and explicitly links the TMT to firm level outcomes. Second, the Upper-Echelon perspective supports theories of demography (Pfeffer, 1983) by contending that managerial characteristics are representative of managerial experiences and, consequently, their cognitive base. Thus, the Upper-Echelon perspective, coupled with theories of demography, has led to an explosion in TMT research.

There is sentiment that senior executives are instrumental in the development and execution of a firm's strategy. For instance, executives are the boundary spanners and information processing centers of a firm (Geletkanycz & Hambrick, 1997; Kotter, 1982; Mintzberg, 1973). Consequently, a senior executive team is the key linkage between the organization and its environment (Pfeffer & Salancik, 1978). Not surprisingly, the decisions and planning of these key individuals is important in securing favorable strategic outcomes (Mintzberg, 1973; Mintzberg *et al.*, 1976).

2.5.3.1.1. The Chief Executive Officer

The CEO can be considered a special individual residing at the top of the TMT. While some studies avoid studying the CEO as a separate entity, there are many who contend that the CEO, as a single individual, is of both theoretical and applied importance (Gupta, 1988; Harrison, Torres, & Kukalis, 1988; Hosmer, 1982). To begin with, because a CEO is the spokesman for the firm and often occupies the "bully-pulpit" of the firm, the CEO is of symbolic, but strategic, importance. Next, empirical work has tied CEO power to firm performance (Daily & Johnson, 1997). Also, others contend that the CEO is the most important member of the TMT and can set the strategic path for the firm (Waldman & Yammarino, 1999). CEOs also are usually the highest-paid executives in the firm, driven by the belief that they are of critical importance. Moreover, the recruiting and selection of a CEO requires extensive outlays of firm resources, again driven by the belief that the CEO is of substantive importance to the firm. When these reasons are coupled with the reality that little to no competitive behavior research has focused exclusively on the CEO, the need for empirical inquiry becomes evident.

2.5.3.1.2. The Board of Directors

It is likely that issues pertaining to corporate governance will continue to rise given the recent attention towards corporate scandal. In fact, many in the applied press attribute corporate failures to breakdowns in the firm's governing body (Hymowitz, 2003). Clearly, more insight into the functioning of the BOD and their influence on strategic outcomes is of both theoretical and applied worth.

The BOD has four primary functions: (1) endorse management initiatives, (2) monitor management, (3) distribute feedback, and (4) provide real and symbolic resources (Johnson, Daily, & Ellstrand, 1996; Pfeffer, 1973; Schaffer, 2002). In reality, these duties are bestowed formally and legally by US corporate law (Baysinger & Hoskisson, 1990). Additionally, many BODs are taking leading roles in the strategy formulation process (Johnson *et al.*, 1996). Indeed, there is "growing acceptance that decisions taken or not taken by boards can make a difference to the dynamics that influence company performance" (Cutting & Kouzmin, 2000: 479). Similarly, consensus is forming that effective governance mechanisms contribute directly to firm survival and prosperity (Charkham, 1994). With that said, there has been little, if any, research on how a BOD can influence a firm's competitive behavior. Thus, it would appear that careful examination of the relationship between the BOD and a firm's competitive behavior could more fully inform both governance and competitive behavior audiences as to the real impact of the BOD on firm strategy.

For these reasons, the precedent to view the Upper-Echelon of management as a prime contributor to firm-level outcomes is well established within Business Strategy literature. In

Table 2.8 below, I organize some recent TMT research, some common measures, and research conclusions.

Table 2.8

Executive Forms of Human Capital & Strategic Outcomes

Citation	TMT Characteristics	Dependent Measures	Correlations/Betas	Conclusions
Carpenter (2002)	Heterogeneity (education, work experience, and tenure)	Performance	1) TMT Tenure Heterogeneity (.16* correlation) with ROA 2) TMT Education Heterogeneity (.089* beta) with ROA	Weak relationship between demographic heterogeneity and firm performance was moderated by international strategy.
Carpenter & Fredrickson (2001)	Heterogeneity (education and tenure)	Global strategic posture (degree of dependence on foreign markets for customers and factors of production)	1) TMT International Experience (.17* beta with glob. posture) 2) TMT Education Heterogeneity. (.19* beta with glob. posture) 3) TMT functional Heterogeneity (-.10* beta with glob. posture) 4) TMT tenure Heterogeneity (.12* beta with glob. Posture)	TMT educational experience, education heterogeneity, tenure heterogeneity, was positively related to the global strategic posture of a firm. Functional heterogeneity was negatively related.
Simons, Pelled, & Smith (1999)	Heterogeneity variables	Firm Performance and Quality of Decision Making	1) Age diversity (-.29* beta with change in profitability) 2) Functional background (-.23* beta with change in profitability) 3) Educational background Heterogeneity (-.30 beta with decision quality)	Debate among TMT members moderated the relationship between demographic variables and firm performance
Wierseman & Bantel (1992)	Test of Demographic Trait versus Demographic Heterogeneity	Corporate Strategic Change (Change in Diversification strategy over 3 year period)	In general, demographic traits of age, firm tenure, education level were positively related to strategic change	Demographic heterogeneity variables offer very low and non-significant relationship with strategic change.
Hambrick & D'Aveni, (1992)	TMT Characteristics (compensation, tenure, etc.,)	Bankruptcies	1) Average Firm tenure (-.04* beta) with bankruptcies 2) Team Compensation (-.07* beta) with bankruptcies	Conclusions: tenure and compensation are both indicators of Human Capital and talent within a team. Higher tenure and compensation are correlated with lower bankruptcies

The choice of these studies is by no means exhaustive. It does, however, offer some insight into the central and global themes that emanate from TMT research over the last two decades.

As is the case with the lone TMT study in competitive behavior (Hambrick *et al.*, 1996), heterogeneity scores on demographic characteristics are, generally, unimpressive in their predictive capacity of strategic outcomes. At the very least, there are sufficient studies of quality that dispute heterogeneity scores as substantively important (Wiersema & Bantel, 1992). There is some recent evidence that suggests heterogeneity scores become meaningful only when they interact with other process-oriented variables (e.g., Knight, Pearce, Smith, Olian, Sims, Smith, & Flood, 1999). Furthermore, Wiersema & Bantel's (1992) widely cited TMT piece concludes that straight demographic traits (e.g., firm tenure) appear better predictors of strategic outcomes when compared to heterogeneity scores. While some of the authors discussed above did not use Human Capital theory to support their use of proxies, it does appear, in general, that the proxies relating to tenure and education are among the more robust demographic antecedents of strategic outcomes. Again, this is also reflected in the single competitive behavior piece that focused exclusively on TMT variables; education and tenure were positively related to action propensity and separate indexes of magnitude. The final theme of TMT research is that industry context does matter (Carpenter, 2001). In some industries, autocratic and dominant CEOs may be more successful due to the lack of discretion that the environment affords (Halbelian & Finkelstein, 1993). Conversely, dynamic and complex environments require different characteristics of their executives. Consequently, other industry samples should be investigated before we can state with confidence the role of executives in driving a firm's competitive behavior.

The single most substantive evidence that Human Capital should matter to a firm's competitive survival is a rather impressive piece authored by Pennings, Lee, & Arjen van Witteloostuijn (1998). They examined the effect of Human Capital on firm dissolution with a 110-year longitudinal data set of Dutch accounting firms. In a test of population ecology versus Human Capital arguments, they included over 30 control variables in their study. Importantly, their Human Capital variables of industry tenure, firm tenure, and graduate education were among the strongest predictors of firm survival as depicted in Table 2.8.

Table 2.9

Executive Forms of Human Capital & Strategic Outcomes

Human Capital Variable	Beta with Firm Dissolution
Graduate Education	-.138*
Industry Tenure	-.11*
Firm Tenure	-.24*

A similar study using a sample of law firms reinforced these results with some caveats (Hitt *et al.*, 2001). Using quality of law school attended and tenure as a law firm partner as indicators of Human Capital, the authors found an initial expense in bringing in attorneys with high levels of Human Capital. They were more expensive on the open labor market and represented a significant initial cost to the firm which initially detracted from firm performance. However, the authors squared the Human Capital term and found a curvilinear effect; Human Capital is initially costly but benefits the firm over time. Second, they also demonstrated that Human Capital interacted with the legal firms' geographic strategy to influence performance. In all models tested, the squared Human Capital term, itself, was significant and tended to improve the explanatory power of the model by 3% (R^2 change).

For these reasons, it appears that the field of competitive behavior could benefit from further examining Human Capital factors as drivers of a firm's competitive moves. Moreover, examining these factors in another sample should also improve inferences of external validity.

2.5.3.2. Executive Research and Demography

Another broad generalization from a review of the senior management literature is the prevalent use of demographic variables or proxies. Pfeffer (1983: 348), one of the earliest advocates of demography, argued that personal characteristics, such as age, gender, or firm tenure, represent a pivotal “causal variable that affects a number of intervening variables and processes, and through them, a number of organizational outcomes.” A main premise of demography is a senior executive's influence on a firm is colored or marked by a product of his or her life experiences, which can be captured by demographic characteristics (Carpenter & Fredrickson, 2001; Pfeffer, 1983). The Upper-Echelon perspective (Hambrick & Mason, 1984) tends to reinforce the importance of demography by contending that strategic choice and performance levels are partially predetermined by managerial background characteristics. There are, however, important distinctions among different dimensions of demography and their relationship with human and social forms of capital. The two major demographic distinctions are trait and diversity effects (Pfeffer, 1981; Wiersema & Bantel, 1992).

2.5.3.2.1 Trait Effects

Demographic trait effects signify that having a certain demographic characteristic will predict an individual's perspective, interpretation, and cognitive base. Trait effects indicate an individual capability. Demographic trait effects do not connote team processes or integration. Note that benefits resulting from demographic traits are usually delivered in an additive fashion. Education and tenure are the predominant demographic trait variables of Human Capital (e.g., Pennings, Lee, & Witteloostuijn, 1998).

2.5.3.2.2 Demographic Diversity/ Relational Demography Effects

Unlike demographic trait effects, relational demography or demographic diversity effects involve two or more individuals. Relational demography highlights the demographic differences that exist among people. From these differences, inferences are made to processes and outcomes such as group cohesion, integration, and communication. Based on this logic, groups that are more similar enjoy relationships infused with greater levels of trust and better communication. Unlike trait effects, relational demography variables better capture interpersonal relationships or processes (Buchholtz *et al.*, 2003).

2.5.3.2.3 Efficacy of Demographic Proxies

Proxies are inherently flawed because they are an indirect and, often, removed measure of the construct of interest (Pedhazur & Schmelkin, 1991). Their use within executive research, however, is often driven by the accessibility of the sample (Seidman, 1998). Because senior managers are both busy and subject to many demands, the feasibility of survey, interview, or

observation instruments are simply not tenable. Pedhazur & Schmelkin (1991) advise using common sense and judgment to demonstrate face validity of proxies.

In addition, there is some empirical evidence that supports the use of demographic surrogates. For instance, Finkelstein (1992) adopted a multi-trait multi-method approach (Campbell & Fiske, 1959) to demonstrate convergent validity between demographic variables and a self-report survey instrument (Finkelstein, 1992). Further testing of Finkelstein’s (1992) correlation matrix (Offstein, 2003) resulted in a Confirmatory Factor Analysis that largely supported convergent claims between proxies and self-report measures with the exception of elite education. Finkelstein’s (1992) correlation matrix is reproduced below in Table 2.10.

Table 2.10

Reproduction of Finkelstein’s Correlation Matrix

Power Variables N = 1,763	1	2	3	4
1. Proxies of structural power				
2. Proxies of Ownership Power	.17*			
3. Proxies of Expert Power	.05*	-.08*		
4. Proxies of Prestige Power	.43*	.01	.15*	
Self-report measures of dimension	.72*	.18*	.08	.52*

In another novel study conducted by Smith and colleagues (1994), supporting evidence was found for direct effects between several demographic proxies and firm performance in high technology firms. However, they also found that team processes, such as social integration and communication, mediated much of the relationship between demographic variables and firm performance. I have included several of the path coefficients to firm performance in Table 2.10.

Table 2.11

TMT Demographic Variables and Organization Performance

<i>TMT Demographic Variable</i>	<i>Performance Variable</i>
Experience Heterogeneity	-.26* with Return on Investment
Education Heterogeneity	.38* with Sales Growth
Education Heterogeneity	.26* with Sales Growth

This study suggests that demographic variables should not be discounted out of hand, and, as suggested initially by Pfeffer (1981), demographic variables seem to, indeed, affect and alter key processes, such as social integration, which, in turn, influence organizational outcomes.

2.6 SOCIAL CAPITAL

Coleman (1988) and Leana and Van Buren (1999) define Social Capital as the human assets that are embedded in relationships that contribute to valuable outcomes. Others similarly define Social Capital as the stock of active connections between people (Cohen & Prusack, 2001). The antecedents of Social Capital are often in the form of trust, mutual understanding, and shared values and behaviors that bind human actors into communities and make cooperative action possible (Cohen & Prusack, 2001). Importantly, the elemental unit of Social Capital is a relationship.

2.6.1 Conceptualizations of Social Capital

Business Strategy researchers tend to embrace Social Capital as the network of relationships that exist among firms (Burt, 1997, Powell, Koput, & Smith-Doerr, 1996). When this approach is taken, “tie” theories such as Granovetter’s (1973) weak tie approach or Burt’s structural tie theory (Burt, 1992) are used to understand how Social Capital impacts such firm strategic outcomes as learning and innovation (Powell *et al.*, 1996). This approach, however, is only one perspective of Social Capital theory. For instance, other researchers focus on the behavioral, as opposed to the structural, properties of relationships. Recent theoretical work outlines three main dimensions of Social Capital (Nahapiet & Ghoshal, 1998). These dimensions are important because they capture both the structure and content of relationships. In addition, these dimensions are of use whether one views Social Capital as either an inter- or intra-firm phenomenon. See Table 2.12 below.

Table 2.12

Conceptualizations of Social Capital

Social Capital Dimension	Definition
Structural	Configuration or arrangement of actors in a relationship network
Relational	Quality and richness of personal relationships that people have developed with each other through a history of interactions; includes respect and friendship between two actors
Cognitive	A shared code or shared paradigm that facilitates common understanding of collective goals and proper ways of acting in a social system

Building particularly on the last two dimensions of relational and cognitive Social Capital, recent theory building focuses on Social Capital as primarily an intra or within firm

phenomenon (Leana & Van Buren, 1999). Termed organizational Social Capital, this theory examines the benefits to a firm that accompany the character and richness of relations between actors within an organization. Firms that leverage their organizational Social Capital are likely to enjoy greater efficiency and flexibility, as well as superior knowledge creation (Leana & Van Buren, 1999).

2.6.2 Measurement of Sources of Organizational Social Capital at the Upper-Echelon Level

Given the novelty of this theoretical perspective, few, if any, attempts have been used to empirically measure organizational Social Capital, particularly at the Upper Echelons of a firm. Indeed, Leana and Van Buren (1999: 555) note that the “empirical work on organizational Social Capital will need to begin with a refinement of its components and the development of specific measures and indicators.”

These authors argue that indicators of organizational Social Capital need to capture two primary dimensions: trust and associability. Trust, itself, is a rather complex construct that is not prone to easy measurement (Leana & Van Buren, 1999). Associability is similar to collectivism (Wagner, 1995), in that it captures the values, shared beliefs, and affective component embedded in a relationship between two or more people. While capturing team potency and other affective components have been accomplished through survey and observation instruments (e.g., Campion, Medsker, & Higgs, 1993), the use of these instruments at the Upper Echelons is often not plausible. For these reasons, investigation into apropos and well-suited proxies or surrogates is necessary if organizational Social Capital is to be captured at the Upper Echelons of an organization.

Recent discourse on Social Capital offers insight into the measurement issues surrounding this construct. Adler and Kwon (2002) suggest that to best understand organizational Social Capital, researchers must discern among sources of Social Capital, Social Capital itself, and the effects of Social Capital. Given that capturing the “goodwill” and “trust” that comprises Social Capital is difficult, especially at the Upper-Echelon levels, and the fact that this dissertation examines hypothesized outcomes associated with organizational Social Capital, measures or indicators of possible sources of Social Capital hold the greatest appeal. Adler and Kwon (2002) specify that Social Capital forms only when there are ample opportunities, motivation, and abilities between people or collections of people. Without opportunity for contact, the chances and occasions needed to generate Social Capital are limited. Motivation reflects the desire to help or assist another in the absence of immediate or certain returns (Adler & Kwon, 2002; Portes, 1998). Furthermore, Portes (1998) identifies consummatory motivation as critical to the development of Social Capital. Consummatory motivation arises from deeply internalized norms, similar attitudes, intense socialization, or a feeling of a shared destiny (Portes, 1998). The last identified source of Social Capital is ability, which are the competencies and resources embedded within the network or found at nodes within a network (Adler & Kwon, 2002). In summary, measures of sources of Social Capital should ideally tap the dimensions of opportunity, motivation, and/or ability of social relations.

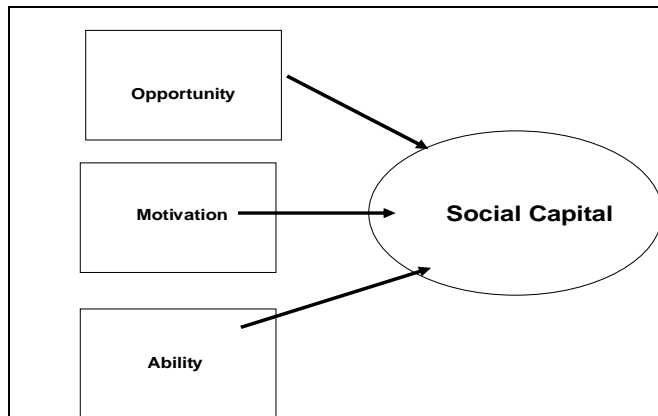


Figure 2.4. Sources of organizational Social Capital (Adler & Kwon, 2002).

2.6.3 Relational Demography as a Measure of Organizational Social Capital

The approach of relational demography is grounded in one primary assumption (O'Reilly, Caldwell, & Barnett, 1989; Young & Buchholtz, 2002). Namely, people tend to identify with, trust, and like those people who are similar to themselves on salient demographic characteristics. Not surprisingly, it is believed that people who are more similar enjoy better relational processes (Young & Buchholtz, 2002). This measure is supported by Pfeffer's (1983) theory of demography, by Byrne's (1971) similarity attraction perspective, and by Zenger and Lawrence's (1989) communication theory among like people or peoples. Pfeffer (1983) argues that similar cohorts develop rather similar outlooks and feelings of solidarity. In addition, an affective bond develops, which enhances team integration and coordination.

The similarity attraction paradigm emphasizes more individualist psychological perspectives. Based on the similarity attraction perspective (Byrne, 1971), demographic

similarity between two parties leads to perceived similarity in attitudes, beliefs, and values.

This, in turn, tends to drive interpersonal attraction between two parties.

Young and Buchholtz (2002) also note that communication theories lend critical support to relational demography. Namely, Zenger and Lawrence (1989) suggest that individuals who have in common demographic characteristics will tend to have similar social, educational, and work experiences. Consequently, these shared experiences enhance the quality, and perhaps, the trust and associability, of interpersonal relationships, which contribute to productive work relationships and processes. The most common demographic characteristics used are age, gender, and tenure (Young & Buchholtz, 2002).

Westphal and Zajac (1995) examine the interaction between demography and power to arrive at the general conclusion that CEOs and directors strive and desire for demographic similarity with the other strategic human partner. Specifically, they find (1) when incumbent CEOs are more powerful than their boards, newly appointed directors are likely to be demographically similar to the firm's CEO; (2) when boards are more powerful than their CEOs, new directors resemble the existing board; and (3) greater demographic similarity between the CEO and the board resulted in generous pay decisions for the CEO. In fact, a combined dissimilarity index of functional, age, and education demonstrated a stronger relationship with total compensation of the CEO when compared to other independent variables of director stock ownership, total stock returns, and performance indicators, such as return on assets and log of sales. Moreover, including the dissimilarity measure improved the explanatory power of the model 20% (from an R^2 of 18% to 22%). This provides some evidence of the efficacy of demographic variables as either indicators or predictors of important social processes, such as the selection of a new CEO or director.

2.6.4 Key Differences between Human and Social Capital

While Human Capital and Social Capital appear similar in many ways, there are key differences between the two. To begin with, Human Capital stresses the importance of the individual, whereas Social Capital supports the interaction or relationship between people as critical. Next, Human Capital involves pooled interdependence. Conversely, Social Capital emphasizes sequential and reciprocal interdependence. Consequently, Social Capital addresses the combination or bundling of human factors to achieve competitive advantage (Dess & Shaw, 2001). Perhaps not explicit, this difference suggests that Human Capital benefits are additive. Also, the manner in which Human Capital and Social Capital can be improved differs considerably. Human Capital improvement hinges on the enhancement of skills and abilities. Because Social Capital enhancement rests on the interaction, integration, and relationships among people, improvements to the processes are likely of more importance. Finally, the literature recognizes both Human Capital and Social Capital as intangible and complex. But because resources leading to a sustained competitive advantage differ in degree (Barney, 1991), not in sum, it is likely that the combination of people, ideas, abilities, skills, and knowledge found in Social Capital make it more of a resource-based advantage than Human Capital. Based on this logic, it is important to investigate independently the influence of Human and Social Capital on a firm's competitive behavior.

2.7 EXECUTIVE COMPENSATION

Executive compensation is of considerable interest to applied and scholarly audiences. The firm level effects of executive compensation, however, are not well established (Gerhart & Milkovich, 1990). In response to poor meta-analytic findings between top executive pay and firm performance, there has been a change in tactics among compensation researchers. Namely, compensation researchers “have begun to focus on a number of social and political explanations for executive pay” (Henderson & Fredrickson, 1996: 575). Facing disappointing findings from the consequences of pay, many have turned to understand the antecedents of executive pay.

Armed with rich theoretical support in behavioral (e.g. expectancy and goal theories) and economic perspectives (e.g., agency and tournament theories), Finkelstein and Hambrick (1988) challenged researchers to pursue other more proximal dependent variables than firm performance. In regard to competitive behavior, a handful of researchers have begun to identify relationships between both the type and distribution of executive pay and firm behavior (Offstein *et al.*, 2003). Their research, however, has stopped short of examining the moderating influence of compensation on firm competitive behavior.

While executive compensation is not frequently used as a moderating variable, there is some precedent to do so within the literature. For instance, Gomez-Mejia (1992: 389) found that “firm performance is a positive function of the degree to which compensation strategies reinforce or match corporate strategies.” I reproduce his regression table in a modified version in Table 2.13 to demonstrate the potency of a possible interactive effect. Firm performance is the dependent variable.

Table 2.13

Example of Moderating Influence of Executive Compensation

Variable	Beta/F ratio	Pearson Correlation	Change in R²
Firm size (control)	.036/.19	-.11	
Life cycle (control)	-.184/4.41*	-.20	
Labor cost ratio (control)	.055/.53	.13	
R&D intensity	.075/.97	.15	From all controls: .05
Evolutionary Diversification Strategy	.011/.01	.22	From all strategies entered into step 2: .09
Interaction between evolutionary and compensation strategy	.722/15.07*	.27	From all interactions entered into step 3: .11

Based on this study, the predictive value of the interaction between firm strategy and compensation strategy predicted performance more than did R&D expenditures.

Studies examining variable executive pay are particularly important because of the motivational and goal properties that tend to be associated with variable pay plans (e.g., bonuses, stock options, stock grants, etc.) (Gomez-Mejia & Balkin, 1992). For instance, Rajagopalan (1996) found that annual bonus plans that use cash incentives with accounting measures of performance lead to better performance among firms with defender strategic orientations. These examples are meant to expose two themes within the compensation research stream. First, more inquiry is needed into the outcomes associated with compensation programs. Second, an apropos place to begin investigation is the moderating influence of pay, especially variable pay plans, on a firm's competitive behavior.

In conclusion, several points are made here. First, there is evidence that pay influences and reinforces a firm's strategy. Second, type of pay appears to influence the outputs and

functioning of an organization. Finally, there is direct evidence that variable pay may moderate the strategy to financial performance relationship. With but a few exceptions (Offstein *et al.*, 2003), there is little understanding on how executive pay can influence the competitive behavior, and consequently, the competitive strategy of a firm.

3.0 THEORETICAL MODEL

Embedded within firms are unique stores of intangible capital that influence the way firms compete. The Human and Social Capital of the firm, particularly at the Upper Echelons, contributes to the awareness, capability, and motivation of the firm to compete. These intangible firm assets are often amplified when motivated by organizational policies and procedures, such as a firm's executive compensation program. Taken together, I advance an Upper-Echelon perspective of competitive behavior focusing on the amount, variety, and types of actions that these assets are likely to influence.

3.1 THE UPPER-ECHELON PERSPECTIVE OF COMPETITIVE BEHAVIOR

I develop an Upper-Echelon perspective of competitive behavior that borrows from three separate research paradigms. I first draw on the Human Capital perspective, which is defined as the knowledge, skills, and abilities embedded *within* an individual (Becker, 1962, 1964) that makes him or her a valuable, rare, inimitable, and non-substitutable asset (Barney, 1991). Second, I adopt an intra-firm perspective of Social Capital. The construct of organizational Social Capital is defined as the information, resources, and knowledge that are embedded in relationships *between* people within the boundaries of a firm (Leana & Van Buren, 1999). Finally, I examine executive compensation systems and packages that are designed to fuel, influence, and motivate individual and group behavior (Gomez-Mejia & Balkin, 1992).

I propose that high levels of Human and Social Capital coupled with executive compensation fulfill several functions necessary for firms to engage in competitive behavior. To begin with, they enhance a firm's awareness of the competitive environment. Next, these unique forms of capital fueled by well-designed compensation plans augment a firm's capability to compete. Since awareness, motivation, and capability are essential for firm Competitive Activity (Chen, 1996), I propose that high levels of Human and Social Capital interact with a firm's executive compensation plan to enable the firm to undertake many, diverse, and wide-ranging competitive actions and, thus, improve the overall Competitive Intensity of the firm.

Because this is an initial attempt to understand how Human and Social Capital influence a firm's competitive behavior, I chose as a launching point the human assets at the Upper Echelons of a firm. Recognizing that not all Human Capital within a firm is of equal strategic significance (Lepak & Snell, 1999), I examine those human assets at the apex of the organization: CEO, TMT, and the BOD. Inquiry into the effects of these actors' Human and Social Capital is appealing because they have been theoretically and empirically linked to other strategic firm outcomes to include firm performance (e.g., Daily & Johnson, 1997; Finkelstein, 1992; Hambrick & Mason, 1984; Westphal & Zajac, 1995).

3.2 INDEPENDENT VARIABLES

3.2.1 Human Capital

While Human Capital is, first and foremost, a type of capital, it differs from other forms of capital in several ways. First, unlike traditional forms of capital such as a research and

development facility, Human Capital is uniquely mobile (Berkowitz, 2001). Simply, talented individuals can enter and exit the firm freely. Second, Human Capital also differs from other forms of capital in that capital depreciation is not certain (Adler & Kwon, 2002; D'Aveni, 1994). In fact, organizational interventions can counteract depreciating forces through human development and training (Lepak & Snell, 1999). Additionally, its very use can appreciate its value (Adler & Kwon, 2002).

Whereas knowledge and skills are typically identified in the definition of Human Capital (Becker, 1962; Buchholtz *et al.*, 2003), individual traits and dispositions are also important. Like knowledge and skills, they are embedded within an individual and influence a person's decisions, choices, and performance. Hence, I incorporate traits and dispositions into an executive's Human Capital.

Human Capital can be broadly categorized into: firm-specific, industry-specific, or general Human Capital (Buchholtz *et al.*, 2003; Dess & Shaw, 2001). Firm-specific Human Capital is defined as idiosyncratic knowledge, skills, or abilities that are of value to a very few organizations (Wernerfelt, 1984). Industry-specific Human Capital reflects a broader set of knowledge, skills, and abilities that could be of value to several organizations within an industry. Finally, there is general Human Capital, which is defined as knowledge, skills, and abilities applicable across both organizations and industries. Of course, individuals are likely to possess differing levels of firm- and industry-specific, as well as general, Human Capital.

3.2.1.1 Knowledge

Knowledge is a promising source of competitive advantage because it can help mitigate environmental uncertainty, enhance firm efficiency, encourage organizational flexibility, and foster innovation (Grant, 1996; Kogut & Zander, 1992; Weick & Roberts, 1993). Human Capital is important because it can contribute to a firm's repository of knowledge and competencies (Kogut & Zander, 1992; Weick & Westley, 1996).

Knowledge is often identified along two key dimensions. The first form of knowledge is articulable or codified knowledge (Lane & Lubatkin, 1998; Nonaka, 1994; Polyani, 1967). This type of knowledge is easily transferred among people and can be replaced readily (Nonaka, 1994). The other dimension is tacit knowledge. This type of knowledge is more refined, precise and accurate; tends to be unique; is difficult to imitate; and has a higher probability of driving strategic change when compared to articulable knowledge (Lane & Lubatkin, 1998; Maister, 1993; Mowery, Oxley, & Silverman, 1996; Nonaka, 1994). To reiterate, embedded in Human Capital is knowledge, of which tacit knowledge tends to contribute most to an individual's Human Capital.

3.2.1.2 Skills

Another major component of Human Capital is that of skills. Different groups within an organization possess different skill sets (Lepak & Snell, 1999). Without discounting the importance of skills that the labor force brings to an organization, I have chosen to identify skills

as they relate to senior managers to develop and build the construct of Human Capital as it relates to the Upper-Echelon perspective of firm competitive behavior.

Human Capital theorists discern among three sets of managerial skills. They are technical-, human-, and conceptual-based skills (Coff, 2002). While it is difficult to identify all the possible skills that comprise a manager's Human Capital, it does appear that some skills contribute more to the formation and development of Human Capital. Some of these important skills include leadership, decision-making, allocation of resources, relating to subordinates and peers, and information processing (Harris & Helfat, 1997; Hitt *et al.*, 2001; Mintzberg, 1973). Further, the skills of managerial flexibility, conflict resolution, and introspection may likely also constitute and augment a manager's Human Capital (Berkowitz, 2001; Mintzberg, 1973). One of the key assumptions behind managerial skills is that they are subject to change and can be developed and improved (Coff, 2002). Indeed, a premise behind skill development is that managers can perfect their skills by doing or through prior work experience (Mintzberg, 1973).

This is traditionally where the construct of Human Capital ends in respect to contemporary research. Since Human Capital stresses the inherent value that exists within people, I choose to pursue individual dispositions and traits as a third dimension of Human Capital. Understanding and identifying specific traits or dispositions are believed valuable because they help predict a person's behavior across situations and contexts (Carson, 1989). Of particular note, dispositions are determined by both genetic and environmental forces (Carson, 1989), which may make them less amenable to change than knowledge and skills.

Traits are largely associated with an individual's personality. Personality traits reveal a person's tendencies to act, think, and behave in a certain manner (Carson, 1989). In regard to individual disposition, I emphasize individual ability. Ability is the mental or physical capacity

to accomplish a task (Lubinski & Dawis, 1992). Managerial ability tends to focus on the former. Managers with greater mental ability are more capable and demonstrate aptitude to accomplish difficult tasks (Lubinski & Dawis, 1992). The most general dimension of a person's cognitive ability is his or her general intelligence. Researchers have identified eight main components of general intelligence, some of which include verbal, reasoning, perceptual, and deductive ability (Dunnette, 1976; Lubinski & Dawis, 1992).

3.2.2 Social Capital

Social capital is defined as those relationships that contribute to the creation of valued outcomes (Coleman, 1988; Dess & Shaw, 2001) and exist between individuals (Belliveau, O'Reilly, & Wade, 1996), firms (Burt, 1997), communities (Putnam, 1993), or, even, nations and geographic regions (Fukuyama, 1995). Regardless of the unit of analysis, the relationship is the key component of Social Capital.

Social capital research focuses either on the *structure* of relationships or the *content* of relationships. Most of the recent work on Social Capital has examined structural properties of relationships between firms (e.g., Burt, 1997). Besides the network or structural dimensions of Social Capital, scholars are interested in the content, nature, or substance of the relationships (Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). Nahapiet and Ghoshal (1998) acknowledge structural Social Capital but have advanced two other types of Social Capital: relational and cognitive. Relational Social Capital describes the personal relationships people develop and foster over time through a history of interacting (Granovetter, 1973). Accordingly, relational Social Capital tends to emphasize respect and friendship between people that shape

their behavior (Nahapiet & Ghoshal, 1998). These “actor bonds” are more attitudinal and behavioral than structural (Lindenberg, 1996). Cognitive Social Capital attempts to capture the shared codes and paradigms that facilitate understanding of organizational goals and how to operate within a given social system (Nahapiet & Ghoshal, 1998).

Recently, scholars built on relational and cognitive capital to develop an intra-firm conceptualization of Social Capital. Leana and Van Buren (1999) define organizational Social Capital as the character of social relations that exist within the firm. They further describe organizational Social Capital as involving only those members who have an employment relationship within the firm. Although “these not be traditional employees, in the sense of being full-time, permanent staff,” it does preclude outside organizations or alliances (Leana & Van Buren, 1999: 539). Further, they identify two pivotal antecedents of organizational Social Capital. They are collective goal orientation and shared trust. Trust is particularly emphasized throughout the Social Capital literature (e.g., Cohen & Prusak, 2001).

Trust is either fragile or resilient (Kramer & Goldman, 1995). Fragile trust is transactional and less substantive than resilient trust. Resilient trust involves a deeper commitment between people that can better withstand hardship, obstacles, and the decaying effects of time (Kramer & Goldman, 1995). This type of trust is important to organizations because it promotes cooperation and the sharing of resources between parties (Ring & Van de Ven, 1994).

Organizational Social Capital is likely to provide several competitive advantages to a firm. Organizational Social Capital should facilitate a more flexible and efficient organization, encourage collective action, and promote the development of intellectual imagination and creativity within a firm (Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). What has yet

to be studied, however, is how these benefits of organizational Social Capital affect the overall competitive behavior of the firm.

To conclude, my focus on Social Capital is as an intra-firm phenomenon as defined by Leana & Van Buren (1999). Under organizational Social Capital, many of my linkages to firm competitive behavior are built on relational or cognitive dimensions of Social Capital (Nahapiet & Ghoshal, 1998). Organizational Social Capital and its relational and cognitive dimensions are less studied despite theoretical predictions of improved organizational functioning and performance (Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). For these reasons, organizational Social Capital may assist in the understanding and prediction of a firm's competitive behavior.

3.2.3 Executive Compensation

Executive pay influences the focus, action priorities, behavior, and choices of senior executives (Baysinger & Hoskisson, 1990; Larcker, 1983; Pennings, 1991). Despite huge investments into executive compensation plans, the effects of such pay practices on organizational outcomes are limited, inconsistent, or inconclusive (Jensen & Murphy, 1990). Researchers have several criticisms of executive compensation research to include a lack of interest into TMT pay (Carpenter & Sanders, 2001) and too distant dependent organizational measures (e.g. firm financial performance) of executive compensation (Finkelstein & Hambrick, 1988; Gomez-Mejia & Balkin, 1992).

An executive's total cash compensation is often broken down into two components: fixed and variable. Fixed pay is reflected in straight salary. Because salaries are largely determined

by an external labor market (Cappelli, 1999; Mahoney, 1979), many researchers suggest that a person's salary is a potent reflector of an individual's Human Capital (Cappelli, 1999; Rynes, Schwab, & Heneman, 1983), particularly at the executive level (Cappelli, 1999; Combs & Skills, 2003). High salaries also reinforce a person's commitment to the organization (Coff, 2002; Lee & Miller, 1999), and increase both individual satisfaction (Heneman, 1985) and productivity (Akerlof, 1984; Yellen, 1984).

The other component of an executive's compensation plan is the variable component. Variable pay fluctuates more often, is usually not guaranteed, and is often instituted to protect the firm from managerial opportunism (Eisenhardt, 1989; Gomez-Mejia & Balkin, 1992). The design of variable pay structures tends to be grounded in expectancy and goal theories of motivation (Gerhart & Milkovich, 1990; Gomez-Mejia & Balkin, 1992; Lawler, 1971; Locke & Latham, 1990). In the expectancy model, achieving performance benchmarks (a first order outcome) is instrumental in triggering variable payouts (a second-order outcome). Since variable payouts for executives can reach into the millions of dollars (Gomez-Mejia & Balkin, 1992), the valence for attaining variable pay is usually quite high. For these reasons, variable pay is largely seen as a potent motivational tool that affects executive effort, decisions, priorities, and behavior (Baysinger & Hoskisson, 1990).

Variable pay can be further divided into short-term and long-term variants. Bonuses are usually seen as short-term options for executive variable pay plans (Gomez-Mejia & Balkin, 1992). Bonuses are usually awarded on an annual basis and are usually awarded only after achieving an accounting or market-determined benchmark (Rajapalan, 1996). Long-term variable pay differs from short-term pay along two important dimensions. First, long-term payouts usually confer ownership onto the executive that tend to be in the form of stock options,

grants, or awards (Gomez-Mejia & Balkin, 1992). Second, they are aimed at promoting long-term growth, investment, and strategic plans (Gomez-Mejia & Welbourne, 1989; Hyman, 1991).

3.3 DEPENDENT VARIABLES

3.3.1 Competitive Intensity

The construct of Competitive Intensity arises primarily from a shortcoming within the literature. A review of prior empirical work in competitive behavior illustrates a piece-meal or partial perspective of the elements of competitive behavior that lead to competitive advantage and superior performance. Table 3.1 below highlights some of the overarching themes associated with previous competitive work.

Table 3.1

Common Threads in Competitive Behavior Research

Citation	Competitive Emphasis
Ferrier <i>et al.</i> (1999)	Aggressiveness (Propensity & Volume)
Chen & Hambrick (1995)	Aggressiveness & Force (Propensity & Strategic Activity)
Hambrick, Cho, & Chen (1996)	Force and Aggressiveness (Magnitude & Propensity)
Miller & Chen (1996)	Sophistication (Repertoire Simplicity)
Miller & Chen (1994)	Sophistication (Competitive Inertia)
Smith, Grimm, Gannon, & Chen (1991)	Sophistication (Information Processing)
Chen & MacMillan (1992)	Force (Irreversibility)

Three main competitive attributes seem to emerge as important: aggressiveness, sophistication, and force. To date, no overarching construct incorporates these meaningful dimensions of a firm's competitive behavior. Rather, dimensions have been assumed, implicitly stated, or viewed in isolation without regard to how they interact with other pivotal dimensions to comprise a firm's overall competitive behavior.

To more meaningfully capture the dimensions of a firm's competitive behavior, I suggest the idea of a multi-dimensional construct of Competitive Intensity. Competitive Intensity could be defined as the number, variety, and force of actions or moves that a firm undertakes over time. Competitive Intensity is important because of its impact on three constituencies. First, competitively intense firms can increase their market share due to the volume, complexity, and force of their competitive moves. Competitively intense firms are involved in the activities of the market. This allows them to relate to and better understand their customers. Moreover, customers recognize firms that are visibly active in markets that they care about. Also, when firms are continuously launching a variety of moves, they can, in essence, experiment with moves and receive feedback from important customers. In a similar vein, by launching a barrage

of diverse actions, a firm is more apt to capitalize on the changing and varied tastes or preferences of key customers. Similarly, the force of moves is likely to generate both customer interest and feedback. Second, competitively intense firms are likely to overwhelm their competitors, which makes competitive response difficult. Since moves carry symbols and messages which must be interpreted (Smith *et al.*, 1991), rivals will have a more difficult time deciphering complex moves when they are launched at a faster pace. Further, rival firms must possess both a high tolerance for risk along with greater stores of financial capital to entertain and respond to high quantities of forceful actions by a competitively intense firm. Third, shareholders, analysts, and venture capitalists are likely to view competitively intense firms more favorably. As a result, these key stakeholders are more apt to offer both real and symbolic endorsement to the competitively intense firm. This approval can spur increased investment in the firm, which becomes a critical resource to launch future actions. For these reasons, competitively intense firms are likely more able to secure market benefits because they can launch a high volume of varied and forceful actions. I identify the key dimensions of volume, variety, and force as (1) Competitive Propensity (2) Repertoire Complexity, and (3) Competitive Magnitude.

Competitive Propensity is a collection of competitive moves initiated by a firm, tends to signal a firm's assertiveness and proactiveness (Ferrier, Smith, & Grimm, 1999), and is important for several reasons. First, with competitive aggressiveness comes a concurrent rise in both market share and profitability (Chen & MacMillan, 1992; Ferrier *et al.*, 1999). Second, larger volumes of competitive moves or actions can put competitors at a distinct disadvantage by disrupting the status quo and market environments, which tend to confuse rival firms (D'Aveni, 1994; Ferrier *et al.*, 1999; Young *et al.*, 1996). Finally, when firms compete, they are interacting

with key constituencies within their market to include customers, competitors, and suppliers. As firms engage in more competitive actions, they are likely to gain a more intimate knowledge of these key constituencies, who can impact the profitability and survivability of the focal firm.

Repertoire Complexity involves the breadth of actions a firm launches. Firms with complex repertoires are less likely to be preoccupied with a single set of actions. Repertoire Complexity refers to the range of different actions that a firm chooses to employ (Ferrier *et al.*, 1999; Nayyar & Bantel, 1994). Firms that launch competitive actions across several functional areas, such as research and development, marketing, manufacturing, and distribution, have a more complex repertoire and greater competitive variety than those that pursue only a limited range of activities (Nayyar & Bantel, 1994). Firms realize several benefits when they launch a more complex repertoire. For instance, firms that diversify their sources of competitive advantage often sustain that competitive edge for longer periods of time (Ghemawat, 1986). Next, firms that undertake more variety in their competitive repertoire place a heavy burden on rivals to respond. These firms may be viewed as complex and less predictable. This, in turn, puts a stress on the information processing capabilities of rival firms, which is critical to the competitive process (Smith *et al.*, 1991).

Hambrick *et al.* (1996) describe Competitive Magnitude as the significance of an action or collection of actions. The underlying assumption behind action magnitude is that not all moves are equally valuable in gaining a competitive edge. High-magnitude actions are forceful moves that impact and cause favorable competitive outcomes to the launching firm. Significant moves tend to help the firm in three ways. First, higher magnitude actions put rival firms in a strategically defensive position. Because of the importance of these actions, rival firms feel compelled to respond. Hence, response to significant actions is more of a reflex, rather than a

choice for rival firms. Second, these more significant moves tend to resonate with customers and stakeholders in the market. Indeed, the intent behind high-magnitude actions is often to garner more market share. Finally, firms launch high-magnitude actions to make the firm more efficient and more productive, which directly impact the firm's future competitiveness.

3.4 PROPOSITIONS

Figure 3.1 depicts the conceptual model developed for this dissertation. I examine these constructs at the firm level (i.e. likelihood of a focal *firm's* undertaking an action). In the sections below, I develop conceptual arguments and specify propositions connecting the independent and dependent constructs. It is important to note that I assume other factors (such as firm's size, age, physical resources, markets) examined by prior research (as noted above) to be constant in developing my propositions.

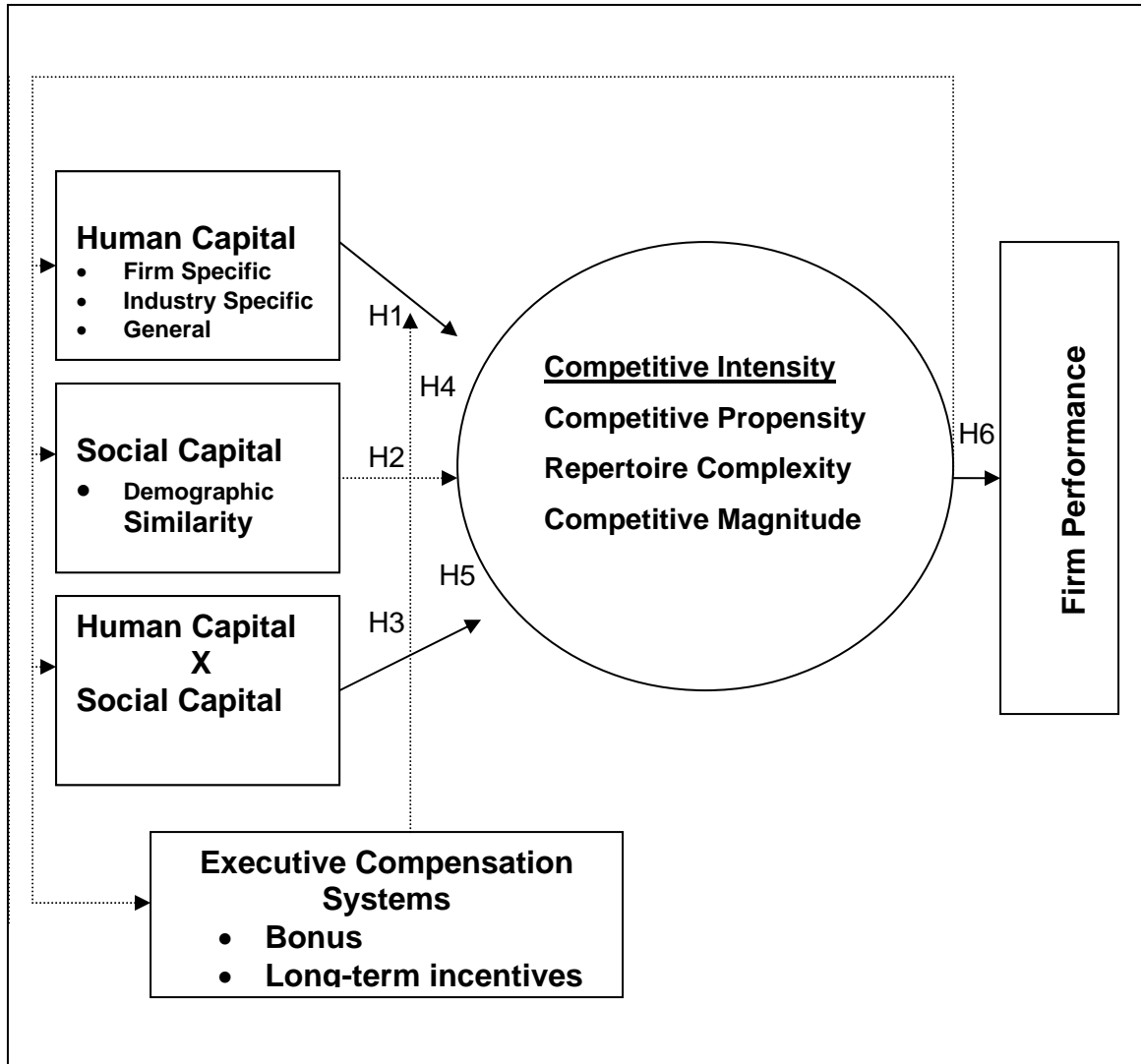


Figure 3.1. The Upper-Echelon model of firm Competitive Intensity.

3.4.1 Effects of Human Capital

While the Human Capital of key strategic human assets is likely to impact all dimensions of Competitive Intensity, it is unlikely that Human Capital affects all dimensions equally or to the same degree. Moreover, the strategic human assets of a firm differ meaningfully, both in

their role within the organization and their contribution to firm strategic outcomes. Thus, to gain a fuller understanding of the Human Capital to Competitive Intensity relationship, it is necessary to further investigate both the human actors involved and the competitive dimensions most likely impacted by this relationship.

The Top Management Team (TMT) is a critical firm asset that engages in several “pre-action” routines to include agenda-setting, planning, information-processing, and decision-making (Simons, Pelled, & Smith, 1999). The TMT is linked to several strategic firm outcomes, such as organizational change and performance (Boeker, 1997). Therefore, the Human Capital of a TMT could enhance a firm’s Competitive Intensity along several key dimensions.

First, higher levels of knowledge, skills, and cognitive ability among senior executives are likely to translate into higher levels of real and perceived power. For instance, higher knowledge and skills embedded within people become the source of expert and prestige power (Daily & Johnson, 1997; Finkelstein, 1992). Importantly, power among executives influences the capability of the firm to compete and to get things done (Finkelstein, 1992; Pfeffer, 1981). Second, executives with managerial acumen are more aware of their firm’s internal capabilities and can quickly respond or launch actions to take advantage of an ever-changing competitive environment. Moreover, higher levels of TMT knowledge, skills, and cognitive ability are likely to prevent extensive information searches that often delay the decision-making process (Mintzberg, Raisininghani, & Theoret, 1976). Also, since some degree of fit between the action and the situation is necessary for the action to be viewed as competitively successful, executives with both internal or firm awareness (i.e. firm-specific Human Capital) and external or environmental awareness (industry-specific Human Capital) are more apt to achieve this level of fit. In essence, this builds on an executive’s opportunity-specific knowledge—a capability

believed to drive the competitive behavior of the firm (Grimm & Smith, 1997). Finally, high levels of Human Capital represent a symbolic or perceived capability that could influence the flow of resources into the firm. For example, Arrow (1973) suggests that very high levels of Human Capital serve, in essence, as a screening device. Simply, he argues that prospective clients closely examine executive credentials before choosing their service. As more stakeholders (e.g., institutional stakeholders, analysts, etc.) use credentials, in part, to allocate sparse resources into the firm, organizations with Human-Capital-intensive TMTs will garner an increased capability from the inflow of these financial and informational assets.

Launching complex repertoires also requires executive Human Capital. Whereas cognitively constrained executives rely on staid and non-complex routines of actions, more cognitively complex individuals are able to deploy more actions across a variety of fronts. Second, more knowledgeable and cognitively complex individuals bring more alternatives to the decision-making process (Klein, 1998). As a result, the quality of the decision-making is likely to improve (Dean & Sharfman, 1996; Mintzberg *et al.*, 1976), and the resulting activity that follows these decisions will show more sophistication. Finally, individuals with high levels of Human Capital are likely to possess refined skills in regard to information processing. Because of their strategic value to a firm, the sensory and perceptual abilities and skills of these key executives become a rare firm resource instrumental in the planning and execution of tasks that are “critical to organizational functioning and performance” (Henderson & Fredrickson, 1996: 576). Moreover, TMTs are the primary contributors to a firm’s organizational information processing. Information processing allows the firm to survey many niches and constituencies within the competitive market (Egelhoff, 1982; Hambrick *et al.*, 1996; Smith *et al.*, 1991). The accumulation and processing of these many forms of information become inputs into the “pre-

action” stage of an action, such as planning, resource allocation, and decision-making. Exposure to multiple constituencies and different aspects of the market also challenge executives’ world-views and prevent the hardening of mental maps (Barr, Stimpert, & Huff, 1992; Nonaka, 1994), which may limit competitive breadth. For these reasons, the more varied and diverse the information used in the pre-action stage, the more likely complex action repertoires and higher levels of competitive variety will result in the execution stage. Thus, TMT Human Capital is likely to provide firm awareness and capability to engage in a variety of activities. See Table 3.2.

Table 3.2

Theoretical Summary Linking TMT Human Capital to Competitive Propensity and Repertoire Complexity

Theory or Perspective	Dependent Variable	Theoretical Note
Power	Competitive Propensity	Enables executives to better steer the firm and meet competitive agenda
Opportunity-Specific Knowledge	Competitive Propensity	Executives can quickly seize competitive opportunities
Institutional Theory	Competitive Propensity	Human Capital is screening heuristic for outside stakeholders to determine amount and kind of investment
Cognitive Complexity	Repertoire Complexity	One of the best predictors of human performance
Decision Making	Repertoire Complexity	Higher knowledge can lead to more and creative alternatives, which impacts diversity of decisions
Information Processing	Repertoire Complexity	Allows executives to better understand the nuances of the competitive market

Proposition 1a: The greater the TMT Human Capital of a firm, the greater the Competitive Intensity of the firm, primarily through increased Competitive Propensity and secondarily through increased Repertoire Complexity.

Scholars and practitioners alike affirm the importance of a firm’s Board of Directors (BOD) as a valuable strategic asset capable of influencing key organizational outcomes (Lorsch, 1989; Westphal & Zajac, 1995). A firm’s BOD performs the critical tasks of advising, controlling, monitoring, mentoring, and counseling senior management (Lorsch, 1989; Waldo, 1985). Additionally, researchers recognize the BOD as an important internal asset accomplished

at securing informational and financial resources from the environment to the benefit of the firm in which they sit (Pfeffer, 1973). In this regard, inclusion of the BOD both satisfies and extends the theoretical boundaries of organizational Social Capital theory (Leana & Van Buren, 1999). Given the contractual nature and responsibilities of the BOD to the firm in which they sit, the BOD seem to meet the conditions outlined by Leana and Van Buren (1999: 539) as “individuals who have an employment relationship with the firm” but “need not be traditional employees, in the sense of being full-time, permanent staff.” By capturing the BOD in this manner, organizational Social Capital theory becomes more inclusive and more potent in its explanatory power as environmental forces are no longer discounted out of hand.

It is important to note that even the most “activist” of boards cannot involve themselves in the day-to-day competitive moves of a firm due to the severe time and commitment constraints that confront a majority of directors (Lorsch, 1989; Schaffer, 2002; Waldo, 1985). So while a firm may not rely on the BOD to assist in the more routine competitive acts of a firm, the BOD is more apt to get involved in actions of greater magnitude that require special commitments and resources.

High-magnitude actions are particularly complex, tend to be of great scope, and involve the workings and interaction of diverse internal and external constituencies (Ghemawat, 1991; Hambrick *et al.*, 1996). Since high-magnitude actions (e.g., building a research and development facility) tend to involve high levels of informal planning, negotiation, and persuasion, stores of tacit knowledge provide more awareness and capability than explicit knowledge to cope with these critical moves. Board members, who are business executives in their own right (Mace, 1971), can assist in building a tacit-knowledge base by offering insight or “best practices” from their respective firms of origin. Consequently, the planning and execution of high-magnitude

actions are improved from the valuable insight and practices of other successful executives. Next, high levels of director Human Capital could signal to outside stakeholders (e.g., investors, politicians, and government agencies) the legitimacy and competence of the focal firm to engage in significant ventures (Dimaggio & Powell, 1983). As a result, stakeholders are more willing to devote funding (e.g., from investors) or provide ready approval (e.g., from politicians and government agencies) to the firm to engage in these usually capital-intensive outlays. Finally, when directors are skilled at mentoring, advising, and counseling, a firm's senior management team becomes more potent (Lorsch, 1989). Directors supply their own knowledge along with their skills of mentoring and counseling to engage in important strategic processes such as driving actions of great magnitude. Said differently, knowledgeable and skilled directors improve the firm's ability to diagnose problems and generate course of action alternatives—both of which are critical in the planning and executing of high-magnitude competitive moves (Mintzberg *et al.*, 1976).

While BOD Human Capital primarily contributes to a firm's Competitive Magnitude, it is also likely to influence a firm's Repertoire Complexity. As mentioned earlier, directors contribute information and knowledge that the organization is unlikely to generate internally (Pfeffer, 1973). The diverse perspectives and viewpoints that directors bring to the table can also contribute to the variety of a firm's competitive repertoire. Accounting for the power of the BOD, it is likely that "activist" boards subject senior management to their multiple and disparate viewpoints, which are reflected in a more sophisticated, complex, and varied repertoire. I consolidate these arguments regarding the effects of director Human Capital on the separate dimensions of Competitive Intensity. See Table 3.3.

Table 3.3

Theoretical Summary Linking Director Human Capital to Competitive Magnitude and Repertoire Complexity

Theory or Perspective	Dependent Variable	Theoretical Note
Tacit knowledge	Competitive Magnitude	Richer knowledge is needed to drive more substantive moves.
Institutional theory	Competitive Magnitude	Legitimacy leads to approval and resources.
Better governance	Competitive Magnitude	Directors with higher Human Capital can better advise and counsel a firm's executives.
Requisite Variety	Repertoire Complexity	Diverse actions require diverse views; the "outsider" perspective that many directors possess is important.
Resource Dependency	Repertoire Complexity	Environmental resources contribute to a diverse firm capability.

Proposition 1b: The greater the BOD Human Capital of a firm, the greater the Competitive Intensity of the firm, primarily through increased Competitive Magnitude and secondarily through increased Repertoire Complexity.

3.4.2 Effects of Social Capital

Because Social Capital is predominantly process- and relationship-driven, I need to more precisely examine the relationships that exist between key strategic actors. I investigate two sets of key executive relationships. Several researchers endorse the unique nature of the CEO when compared to the other members of a TMT (Daily & Johnson, 1997). Researchers believe that how the CEO works and interacts with other members of a TMT affects the functioning of the organization (Henderson & Fredrickson, 2001). The role of the CEO is also of interest to

governance-minded audiences as the CEO is largely viewed as the chief interface between the organization and the directors. Accordingly, I examine how the Social Capital shared between the CEO and TMT, and between the CEO and BOD, influence Competitive Intensity.

Social capital shared between the CEO and his or her top executive staff influences the firm's Repertoire Complexity. High Social Capital within firms promotes boundary-less behavior among executives (Kanter, 1988). Thus, these relationships promote informational diversity and heterogeneity. Organizations develop a superior capability when they transfer diverse sets of knowledge across and through the organization (Yli-Renko, Autio, & Sapienza, 2001). Not surprisingly, these firm attributes are necessary to innovate and respond to dynamic environments (Kanter, 1988; Tushman, 1977) and should also be critical in developing innovative and varied repertoires. Next, high Social Capital between the CEO and TMT may reduce tournament tendencies that could exist within an executive team. Tournament-like atmospheres occur when individuals become strongly motivated to achieve tournament-like prizes (Lazear & Rosen, 1981). In regard to the CEO/TMT relationship, TMTs may work in isolation, and possibly, with political motives to succeed or overtake a CEO, and, as a consequence, achieve CEO-like salaries (Henderson & Fredrickson, 2001). Incidentally, tournament behavior enhances opportunistic behavior, at the expense of team coordination (Henderson & Fredrickson, 2001; Lazear & Rosen, 1981). Without coordination and information sharing among senior executives, the firm loses the ability to generate innovative and varied competitive moves. In summary, Social Capital, and the trust embedded within this capital, foster integrative executive processes instrumental in achieving beneficial competitive outcomes (Hambrick, 1994).

High Social Capital between the CEO and the TMT also benefit a firm's Competitive Propensity. High Social Capital indicates that relationships are based on resilient trust (Dess & Shaw, 2001; Fukuyama, 1995; Kramer & Goldman, 1995). This trust allows for a freer flow of information unimpeded by self-interest or formal communication procedures (Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). Indeed, social relationships serve as channels for information (Coleman, 1988; Tsai & Ghoshal, 1998). Additionally, the content of the message is less likely to be hidden or distorted by political motives that are less prevalent in trusting relationships. Consequently, executives can accept the message as sincere, at face value, without devoting cognitive energy to deciphering second or third meanings. Trusting relationships build a shared language and mutually agreed metaphors that speed the information flow and remove deceptive meanings found in communication (Nahapiet & Ghoshal, 1998). Simply, trust reduces the amount of time it takes for meaningful information to circulate among executives. Executives that engage in inefficient and dysfunctional communication patterns should be slower in bringing actions to the marketplace. Hence, competitive volume suffers. Incidentally, I expect this phenomenon to be more pronounced between the CEO and the TMT when compared to the CEO and BOD due to the frequency of the communication between the top executive and his or her senior management teams; CEO-BOD interaction can be inconsistent and more formalized (Lorsch, 1989; Mace, 1971). See Table 3.4.

Table 3.4

Theoretical Summary Linking Social Capital between the CEO and TMT with Repertoire Complexity and Competitive Propensity

Theory or Perspective	Dependent Variable	Theoretical Note
Information Sharing	Repertoire Complexity	Boundary-less behavior allows for information to quickly spread throughout the firm.
Reduces Tournament Atmosphere	Repertoire Complexity	Tournament behavior is rooted in self-interest and personal drive at the expense of coordination.
Trust	Competitive Propensity	Efficiency gains; little oversight or monitoring; fewer political motives to decipher.

Proposition 2a: The greater the Social Capital between the CEO and the TMT of a firm, the greater the Competitive Intensity of the firm, primarily through increased Repertoire Complexity and secondarily, through increased Competitive Propensity.

Like CEO-TMT Social Capital, the richness and quality of the CEO to BOD relationship can influence competitive outcomes, especially those of great magnitude. To launch actions of great force requires unique firm resources. For instance, to develop and build a new research and development facility usually requires the integration of several key functional areas (e.g., marketing, finance, purchasing, human resources, and engineering). These actions typically affect multiple stakeholders and constituencies within the marketplace. Accordingly, these types of actions require significant attention to detail, rigorous planning, the creation and exploitation of firm knowledge, and large outlays of cognitive and financial capital (Chen *et al.*, 1992; Ghemawat, 1991; Hambrick *et al.*, 1996; Miller & Chen, 1994). I propose that high levels of CEO-BOD Social Capital address several such concerns unique to actions of high magnitude.

First, there are few codified rules on how to launch a successful high-magnitude action. Rather, these types of actions are probably accomplished through what Barney (1991) terms informal strategic processes. High levels of Social Capital promote the sharing of tacit knowledge (Hitt *et al.*, 2001). This knowledge, which is embedded in individual skills and collaborative working relationships (Nelson & Winter, 1982; Szulanski, 1996), creates strategic value to the firm (Lane & Lubatkin, 1998). While many directors sit on boards to provide managerial counsel, many CEOs seek directors who can provide informational resources from the environment (Pfeffer, 1973). Hence, high levels of Social Capital encourage the spread of tacit knowledge into the firm that otherwise would be unavailable or difficult to obtain. Because of the complexities and nuances embedded within high-magnitude actions (Ghemawat, 1991), this type of uncodified knowledge is of particular value in the problem-solving and decision-making stages (Klein, 1998) that lead to the execution of significant moves. Second, not only does high CEO-BOD Social Capital spread knowledge; Social Capital also *creates* knowledge. Indeed, interpersonal processes are the catalyst for knowledge acquisition, creation, and exploitation (Coleman, 1988; Kogut & Zander, 1992). Nahapiet and Ghoshal (1998) expand this point by noting that Social Capital fosters intellectual capital through the combination and exchange of information and knowledge. Third, financial resources or hard assets may be transferred within a firm based on relationships high in Social Capital (Seibert *et al.*, 2001). For instance, members of the BOD may offer resources external to the focal firm for little or reduced cost (e.g., lower borrowing rate) based on the intimacy and strength of relationships with the CEO of the firm. Intellectual or financial resources, major inputs into actions of considerable magnitude, are less likely to become available in firms with low Social Capital. Where groups have distinct and conflicting identities, significant barriers to information sharing, learning, and

knowledge creation arise (Child & Rodrigues, 1996; Pettigrew, 1973). Hence, high levels of Social Capital encourage both the dissemination and the receipt of valuable resources--both financial and informational. Whereas low magnitude moves (e.g., price cuts) require little information sharing, collaboration, and knowledge creation, more significant and forceful actions demand social exchange and combination processes. Fourth, CEO-BOD relationships high on Social Capital lessen administrative and bureaucratic responsibilities, which allow strategic human assets to devote time to more meaningful organizational pursuits. Recall that relationships high on Social Capital are imbued with large stores of trust, and, in particular, resilient trust (Dess & Shaw, 2001; Fukuyama, 1995). This type of trust reduces opportunism and the need for costly contractual agreements or monitoring processes (Fukuyama, 1995, Leana & Van Buren, 1999; Williamson, 1985). With this cost minimized, firms can allocate their resources elsewhere, and capability is enhanced. This point is particularly important in governance relationships. Since directors are often heavily constrained by time and cognitive limitations (Mace, 1971; Schaffer, 2002; Waldo, 1985), any effort not expended in their controlling or monitoring duties can be spent on more value-added or steward-like activities to include counseling and advising the CEO. This discourse and constructive debate are necessary to achieve decision comprehensiveness, which improves upon the sophistication of key strategic decisions (Simons, Pelled, & Smith, 1999).

It is important to note that directors are more involved in the learning and sharing stages with actions of great magnitude, as opposed to less significant actions, because of their vested interest in the success of these large-scale competitive moves. Directors, by law, are required to approve capital-intensive outlays demanded of actions of great magnitude (e.g., constructing a new production plant) and can be held liable and responsible for a firm's large-scale failure.

While risks and liability are quite negligible in some circumstances (e.g., modifying the packaging of a product or service), that is often not the case for more substantive competitive moves. For these reasons, high-magnitude actions are salient issues between the BOD and the CEO.

To a lesser extent, the CEO-BOD relationship can also impact the variety of moves a firm launches. As mentioned earlier, directors are hybrids in respect to their internal and external orientation to the firm. While a BOD affects the internal functioning of the firm (Lorsch, 1989), most of a director's time is spent outside the firm on which they sit. By linking the firm to the environment, directors with strong relationships to an organization's CEO can improve the information-processing and environmental-scanning capabilities of the CEO. For instance, directors may be more willing to share key and critical information from the environment only with CEOs whom they trust. Predictably, willingness to share is tightly related to the amount of Social Capital that exists between two parties (Kanter, 1988). When a CEO cannot properly process information or scan the environment, the overall organizational information-processing capability is diminished. Incidentally, information processing is critical to all competitive behavior because of the messages, hidden meanings, and symbols embedded in the actions launched by rival firms (Smith *et al.*, 1991). In addition, poor information processing and environmental-scanning skills often contribute to a poor understanding of potential customers that exist within the market (D'Aveni, 1994). Consequently, firms cannot meet the varied and diverse demands of their customers if they are not privy to, cannot understand, or process information relating to their needs. See Table 3.5.

Table 3.5

Theoretical Summary Linking Social Capital between the CEO and BOD with Competitive Magnitude and Repertoire Complexity

Theory or Perspective	Dependent Variable	Theoretical Note
Best Practices	Competitive Magnitude	Can improve the implementation of significant moves.
Knowledge Creation	Competitive Magnitude	Affects the formulation of courses of action and can improve a firm's ability to deal with ambiguity, which is more characteristic of move significance.
Resource Dependency	Competitive Magnitude	Social capital with directors can generate informational and financial capital—both of which are necessary for high-magnitude actions.
Agency Problem Reduced	Competitive Magnitude	With opportunism reduced, energies are spent on driving the firm—not controlling the executive.
Decision Comprehensiveness	Repertoire Complexity	Better environmental scanning and information processing leads to greater awareness of the market. Since markets are complex, better understanding can result in more complex and nuanced actions.

Proposition 2b: The greater the Social Capital between the CEO and the BOD of a firm, the greater the Competitive Intensity of the firm, primarily through increased Competitive Magnitude and secondarily through increased Repertoire Complexity.

3.4.3 The Interactive Effects: Integrating Human and Social Capital

To this point, arguments have been targeted to specific human assets (CEO, TMT, or BOD) and have applied to either Human Capital or Social Capital, but not both. I take this

opportunity to investigate consequences arising when key human actors within a firm possess both human and social forms of capital. See Table 3.6.

Table 3.6

Joint Effects of Human Capital and Social Capital

	LOW SOCIAL CAPITAL	HIGH SOCIAL CAPITAL
LOW HUMAN CAPITAL	<p style="text-align: center;"><u>Quadrant 1</u></p> <p style="text-align: center;">LOW COMPETITIVE INTENSITY Low Competitive Propensity Low Repertoire Complexity Low Competitive Magnitude</p>	<p style="text-align: center;"><u>Quadrant 2</u></p> <p style="text-align: center;">MODERATE COMPETITIVE INTENSITY Moderate Competitive Propensity Moderate Repertoire Complexity Moderate Competitive Magnitude</p>
HIGH HUMAN CAPITAL	<p style="text-align: center;"><u>Quadrant 3</u></p> <p style="text-align: center;">MODERATE COMPETITIVE INTENSITY Moderate Competitive Propensity Moderate Repertoire Complexity Moderate Competitive Magnitude</p>	<p style="text-align: center;"><u>Quadrant 4</u></p> <p style="text-align: center;">HIGH COMPETITIVE INTENSITY Low Competitive Propensity Low Repertoire Complexity Low Competitive Magnitude</p>

Table 3.6 illustrates how different combinations of Human and Social Capital relate to firm Competitive Intensity. From this illustration, firms can significantly improve their competitive posture by ensuring appropriate levels of Human and Social Capital within and between their key human strategic assets. Under the condition of high Competitive Intensity, all three competitive dimensions are satisfied. Namely, firms enjoy improved action propensity via high CEO/TMT Human Capital and high Social Capital between the CEO and TMT. In addition, firms in this quadrant enjoy enhanced Repertoire Complexity due to high Human Capital and Social Capital among all strategic actors. Finally, Competitive Magnitude fulfills the last critical dimension of Competitive Intensity. Recall that Competitive Magnitude is achieved through high levels of Social Capital between the CEO and the BOD.

Quadrants 2 and 3 illustrate a scenario in which Human and Social Capital conflict or are in separate high and low conditions. In this scenario of Quadrant 2, there are high levels of Social Capital, which contribute to a firm's action propensity, complexity, and magnitude. However, these benefits are diminished due to lower levels of managerial Human Capital. Low cognitive ability, poor coordination skills, and a lack of understanding at the individual level counteract efficiency, creativity, and informational/resource benefits that accompany high levels of Social Capital (at the team- or group-level of analysis). In essence, this quadrant is indicative of an executive team that is cohesive and trusting. As a result, information flow and sharing is quite high. Unfortunately, the inputs into the development of this information and knowledge are limited due to the low levels of Human Capital. As such, the quantity and diffusion of information is high, but low levels of Human Capital cap the development of rich and deep knowledge. Quadrant 3 is an inverse of this scenario. This quadrant represents a highly qualified executive team, with superior knowledge, skills, and abilities. Unfortunately, their resources remain a private, not public, good due to the lack of trust and poor relationships between key strategic partners. A highly charged political and divisive atmosphere may contribute to Quadrant 3 conditions. In this scenario, the inputs for quality information and knowledge development are high. Unfortunately, poor relationships between key strategic partners prevent the diffusion of benefits associated with high Human Capital throughout the organization.

A firm can improve the Competitive Intensity of their action repertoires by obtaining both Human and Social Capital at the Upper-Echelon levels. This condition, highlighted in Quadrant 4, forms due to the influence of Social Capital on Human Capital. Coleman (1988) describes how high Social Capital magnifies a person's Human Capital through an example of

family relations. In describing how a child learns, Coleman (1988) notes that parents with high levels of education provide only the *potential* for child development. Coleman (1998: S110) argues that “Human Capital may be irrelevant to outcomes for children if parents are not an important part of their children’s lives.” Hence, strong relationships help realize the benefits of Human Capital. Further, the cooperation and collaboration among executives can actually sharpen an executive’s skills or improve upon his or her knowledge base. Simply, Social Capital helps realize and develop a senior manager’s Human Capital.

Proposition 3: As a firm achieves high levels of both Human and Social Capital, the firm’s Competitive Intensity is enhanced through increased Competitive Propensity Repertoire Complexity, and Competitive Magnitude.

3.4.4 Moderating Role of Executive Compensation

3.4.4.1 Human Capital and Pay Type

Compensation systems have potent motivational properties (Lawler, 1971; Locke & Latham, 1990). Consequently, a firm’s executive compensation system is likely to impact the firm’s executives’ motivation to engage in competitive actions. I focus on variable pay components (e.g., bonus and incentives), as opposed to fixed pay structures (e.g., base salary) since researchers believe that variable pay structures impact an individual’s awareness, motivation, and particular behavior choice (Gerhart & Milkovich, 1990; Gomez-Mejia & Balkin, 1992). This is a point of paramount concern since the motivation of human forms of capital is instrumental to achieve organizational goals (Becker, 1976; Coff, 2002; Lee & Miller, 1999;

Parnes, 1984). Motivation, in and of itself, however, is unlikely to result in competitive consequences unless executive intent and drive are leveraged in the best interest of the firm. Perhaps, the most effective mechanism to ensure value congruency between senior managers and firm owners is to promote executive compensation plans that emphasize variable or incentive-type plans (Eisenhardt, 1989). Variable pay is important to the extent that it can motivate an executive to use his or her private stores of capital to achieve valued organizational competitive outcomes. In short, variable-based pay structures induce, motivate, and influence the deployment of a firm's executive Human and Social Capital, which impact the competitive direction of the firm.

Under the umbrella of variable pay, distinctions are usually made between bonus and long-term incentives (Gomez-Mejia & Balkin, 1992). The intent and purpose behind these pay packages are quite different (Gerhart & Mikovich, 1990; Gomez-Mejia & Balkin, 1992). Bonuses have three notable characteristics: they tend to be awarded on an annual basis, are granted only after meeting or exceeding a market or accounting benchmark, and can comprise in excess of 60% of an executive's annual total cash compensation (Gomez-Mejia & Balkin, 1992; Rajagopalan, 1996). Long-term incentives are different in two specific manners. First, long-term incentives tend not to be awarded on annual basis. Rather they are aimed to reward consistent and continual progress for extended time horizons (Gomez-Mejia & Balkin, 1992). Second, long term incentives, comprised usually of stock options, restricted stock grants, and stock awards, confer ownership to the management team leading the firm (Gomez-Mejia & Balkin, 1992). Given these differences, I explore the impact that these separate dimensions of variable pay exert on the relationship between Competitive Intensity and Human and Social

Capital. I limit my discussion to the strategic partners most influenced by variable pay—the TMT.

Bonuses, unlike fixed components of pay, motivate executives to aggressively deploy their human and social forms of capital to achieve competitive outcomes. Most notably, expectancy models of motivation suggest that executives will act and act aggressively (Vroom, 1964). Tackling each expectancy condition separately, we begin to see how bonuses can contribute dramatically to the competitive aggressiveness of the firm. Executives tend to have discretion over how internal firm resources are spent (Finkelstein & Boyd, 1998). Consequently, they can choose to deploy firm assets in a multitude of competitive fashions; the effort to expectancy link should be strong. Engaging in aggressive firm competitive behavior results in several important first-order outcomes, most notable of which are increased firm profits and heightened market share (Ferrier *et al.*, 1999; Smith *et al.*, 2001). Recalling that bonus payouts often hinge on attaining a market or accounting benchmark (Rajagopalan, 1996), increased profits and market share should result in the attainment of bonus payouts, a second-order outcome. Coupled with the fact that bonuses can exceed 60% of an executive's pay (Gomez-Mejia & Balkin, 1992), valence for such payouts should be quite high. In addition to the strong expectancy predictions, the impetus for immediate executive action is reinforced due to the yearly assessments common to bonus structures (Nelson, 1998).

While bonuses forcefully impact a firm's Competitive Propensity, bonuses, to a lesser degree, should also influence a firm's Repertoire Complexity. Bonuses tied to accounting or market benchmarks are meant to ensure that meaningless or staid competitive routines are avoided. Bonuses tend to direct the motivation and awareness of senior management to the marketplace. Understanding that how an executive is measured impacts his or her priorities and

focus (Baysinger & Hoskisson, 1990), market-based bonus measures shift executive focus to the competitive environment. This is critical in the development of a complex repertoire, as executives focused on the competitive landscape are in a better position to understand the many and diverse tastes and demands of their customers (D'Aveni, 1994). In addition, at any given time, the competitive market is flooded by actions from rival firms that often contain symbols, messages, and competitive intent (Smith *et al.*, 1991). Before executives can respond to diverse customer needs with diverse actions or address the varied meanings embedded in a rival firm's competitive moves with varied responses of their own, they first must engage their perceptual filters. Bonuses are likely to assist in that regard. See Table 3.7.

Table 3.7

Theoretical Summary for the Moderating Influence of Executive Bonus Pay on Competitive Propensity and Repertoire Complexity

Theory or Perspective	Dependent Variable	Theoretical Note
Expectancy	Competitive Propensity	Motivation drives executive behavior, which, in turn, drives the activity of the firms they lead.
Affects managerial cognitions and priorities	Repertoire Complexity	Bonuses are linked to market and accounting-based measures, which influences what executives notice.

Proposition 4a: Higher levels of bonus pay will strengthen the relationship between Human Capital and Competitive Intensity as predicted in Proposition 1a.

The long-term incentive portion of an executive's compensation package also influences a firm's Competitive Intensity. I argue that long-term incentives assist a firm in first developing competitive actions of high magnitude, and, second, in undertaking complex actions. Since

Human Capital is embedded within an individual, there is concern that the individual may simply walk away from the organization (Coff, 2002). Thus, retention and commitment are needed to anchor Human Capital to the firm (Lee & Miller, 1999). Scholars note that HR practices encourage stable job tenure (Frank & Cook, 1995). Long-term incentives attempt to generate this executive commitment by tying key individuals to the firm by offering ownership in the organization (e.g., stocks) in exchange for continued service (Gomez-Mejia & Balkin, 1992). Since competitive moves of high magnitude are likely to require patience, commitment, and long-term horizons, incentives may interact with Human Capital to influence these outcomes. In summary, long-term incentives orient the thoughts, mental-maps, and behaviors of top executives towards an extended time horizon, which accommodates actions of great magnitude.

Long-term incentives also promote Competitive Magnitude in other ways. Long-term incentives encourage risk-seeking behaviors from agents who are usually risk-averse (Eisenhardt, 1989; Gomez-Mejia & Balkin, 1992). To encourage executives to move beyond “pre-action” routines such as planning and decision-making into the execution phase of competitive moves requires “carrots” or incentives. Because high-magnitude actions often involve large up-front investments with some ambiguity surrounding future pay-offs, these moves require managerial risk-taking (Ghemawat, 1986). To the extent that long-term incentives (e.g., stock awards) heighten managerial tolerance for risk, a firm is more apt to undertake more significant actions.

Long-term incentives also encourage a firm’s executives to develop a complex repertoire of actions. Creating sophisticated repertoires is a complex managerial task. As such, they require cognitively complex managers who are inclined to coordinate across several business functions. Since launching varied actions tends to employ more business functions and

organizational departments (Nayyar & Bantel, 1994), the synchronization skills of top managers need to be actively engaged. Given the difficulty and the coordination demands of producing these types of repertoires, incentives that can promote executives to launch these more difficult collections of actions become instrumental. See Table 3.8.

Table 3.8

Theoretical Summary for the Moderating Influence of Executive Incentive Pay on Competitive Magnitude

Theory or Perspective	Dependent Variable	Theoretical Note
Commitment	Competitive Magnitude	Executives become more committed to the firm because they are owners of the firm.
Risk	Competitive Magnitude	Incentives reduce managerialist tendencies.

Proposition 4b: Higher levels of incentive pay will strengthen the relationship between Human Capital and Competitive Intensity as predicted in Proposition 1b.

3.4.4.2 Social Capital and Pay Type

To begin with, bonuses attempt to deter or offset managerial opportunism by attaching financial rewards to market or accounting benchmarks. This shift in focus forces TMT members to confront their world-views by contrasting their mental maps to information found in the marketplace, which enables and promotes learning (Nonaka, 1994). As a result, bonuses may thwart damaging group processes such as groupthink or behavioral inertia that threaten team creativity (Hambrick, 1994). In this regard, bonuses foster team awareness that prevents the erosion of complex competitive repertoires.

One of the fundamental assumptions underlying organizational Social Capital arguments is that trusting, intimate, and healthy relationships among people will correspond to valued firm outcomes (Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). However, not all relationships lead directly to organizational objectives. For instance, people engage in relationships for purely personal reasons without intent to use their bond to achieve organizational objectives. Hence, individuals must be motivated to leverage or deploy the capital embedded in their relationships to achieve organizational goals. Variable pay systems, of both bonus and long-term types, provide meaningful group goals that encourage senior executives to more fully leverage their relationships on behalf of the firm. Due to the unique time frame surrounding bonuses and long-term incentives, I believe that bonus payouts influence primarily the annual volume of actions that a team can launch, whereas long-term incentives generate extended thresholds of top management commitment necessary to achieve actions of substantive magnitude.

Proposition 5a: Higher levels of bonus pay will strengthen the relationship between Social Capital and Competitive Intensity of the firm, primarily through increased Repertoire Complexity and secondarily, through increased Competitive Propensity.

Proposition 5b: Higher levels of incentive pay will strengthen the relationship between Social Capital and Competitive Intensity of the firm, primarily through increased Repertoire Complexity and secondarily, through increased Competitive Magnitude.

3.4.5 Linking Firm Competitive Behavior and Firm Performance

The worth of competitive behavior as a mainstream Business Strategy construct rests with how well it can address the foundational question: How do firms earn better than average returns? My premise is that the manner in which firms compete can generate a competitive advantage.

3.4.5.1 Competitive Propensity

When firms launch a high volume of actions, they begin to earn several key advantages. First, attacking firms are seen as more aggressive (D'Aveni, 1994). Aggressive firms instill fear and caution in their rivals, which reduce rival motivation to respond to an action. Consequently, firms that fail to quickly and forcefully respond lose market share and, generally, achieve lower marks on several performance benchmarks (Chen & Hambrick, 1995; Smith *et al.*, 1991). Second, when firms launch moves, they upset the market equilibrium and status quo, which makes the market more difficult for rivals to interpret and adjust to (D'Aveni, 1994; Ferrier *et al.*, 1999; Young *et al.*, 1996). Said differently, when a firm acts, other firms must react or assume more defensive postures. Finally, some scholars argue that the best way to understand key constituencies (e.g., customers) within a given market is to launch actions (D'Aveni, 1994). Importantly, this is often one of the only mechanisms to receive accurate and timely feedback from the market. In general, firms that do not deploy many actions are in less contact with their customers. These firms are less likely to detect changes in customer tastes or preferences.

Proposition 6: Higher levels of Competitive Propensity will result in higher firm performance.

3.4.5.2 Repertoire Complexity

When firms purposefully launch a complex array of competitive moves, they enjoy several market benefits that lead to a competitive advantage. “Purposefully” is the operative word, however, as some firms may appear competitively complex but instead haphazardly launch actions due to a lack of strategic consensus or coherence.

To begin with, Repertoire Complexity allows a firm to diversify its sources of competitive advantage, and, by so doing, sustain that advantage over longer periods of time (Ghemawat, 1986). Next, firms that utilize a variety of moves confuse and tax the information processing capability of the firm. Since information processing is a scarce firm resource, moves that drain this capability from their rivals are likely to generate response problems (Smith *et al.*, 1991). Finally, rival firms should have a more difficult time anticipating or predicting the moves of a competitively complex firm (D’Aveni, 1994). When rivals cannot plan or foresee what another firm is going to do, it becomes more difficult for a competing firm to generate a response in advance.

Proposition 6a: Higher levels of Repertoire Complexity will result in higher firm performance.

3.4.5.3 Competitive Magnitude

Competitive volume and Repertoire Complexity both operate under a single assumption. Namely, these perspectives of competitive behavior assume that all actions are created equal.

Actions do differ, however, on several characteristics (e.g., visibility, noteworthiness, irreversibility) (Chen & Hambrick, 1995; Hambrick *et al.*, 1996). Recalling that behind every competitive action is a purpose and intent (Grimm & Smith, 1997), higher magnitude actions are launched with heightened purpose, resolve, and intent to gain a competitive advantage (Chen & Hambrick, 1995; D'Aveni, 1994). Moreover, when these actions are launched by an organization, there is an expectation that a firm's performance will be influenced. Put differently, the cause and effect relationship between competitive behavior and performance is believed to be stronger when high-magnitude actions are launched.

Proposition 6b: Higher levels of Competitive Magnitude will result in higher firm performance.

3.4.5.4 Competitive Intensity

Despite the importance of each dimension, it is likely that performance effects will be strongest when a firm adopts all three characteristics of Competitive Intensity (volume, variety, and force) into its competitive behavior. Competitively intense firms affect both the market and their rivals in ways that directly impact their performance. Intense firms become embedded in their markets due to the high volume of diverse and significant moves that they launch. Their central role within their markets allows firms to gain intimate knowledge and intelligence of their customers. Knowledge of the diverse and nuanced tastes of a firm's customers is a competitive imperative (D'Aveni, 1994). Also, by consistently launching a high volume of diverse moves, a firm's products and services begin to appeal to a more varied and diverse customer base. Thus, competitively intense firms are more likely to gain a stronger commitment

from current customers that they understand better, as well as capture more and different customers through their aggressive and varied competitive posture.

Competitively intense firms also place a severe burden on rival firms. Information processing is an important firm attribute that allows a firm to understand and anticipate another firm's intent and strategy (Smith *et al.*, 1991). Not surprisingly, a firm's ability to process information and environmentally scan is finite (Henderson & Fredrickson, 1996). When a competitively intense firm launches a move, the pace, complexity, and force of the move taxes the information-processing center of a rival firm. As a result, firms take longer to decipher and interpret these fast and complex moves of force. This, in turn, affects their ability to respond to a competitive move. Response is critical to retaining market share and preventing the erosion of firm financial performance (Chen & MacMillan, 1992; Smith *et al.*, 1991; Smith *et al.*, 2001).

Proposition 6c: Higher levels of Competitive Intensity will result in higher firm performance.

3.5 NON-RECURSIVE PROPERTIES

While my propositions focus on the direct effects of Human and Social Capital on competitive behavior and the moderating role of executive compensation systems between these relationships, it is likely that some non-recursive properties exist within this model. Although I do not offer propositions speaking to this reverse causality, I will touch on them briefly now. Human forms of capital, unlike other forms of capital, tend not to depreciate with use (Adler & Kwon, 2002). Conversely, if one views Human and Social Capital via a learning or knowledge perspective (Nonaka, 1994), these unique forms of capital may actually be more apt to appreciate with use. This is a key distinction between these forms of capital and physical forms of capital,

like a production facility. Therefore, as Human and Social Capital engage in Competitive Activity, it is likely that their stores of Human Capital are amplified simply through learning by doing (Mintzberg, 1973). This practice of competing and exposure to the competitive environment is likely to change, alter, or refine their knowledge (Nonaka, 1994). Hence, as firms engage directly in competitive activities both by type and by amount, they are likely to enhance their stores of Human and Social Capital. Finally, executive pay is likely to both affect and be affected by the process of competing. While I will argue that HR systems, such as compensation systems, drive a human resource or relationship to compete, it is likely that as these human assets compete well, they will ask for enhanced compensation packages on their behalf. Hence, well-crafted compensation systems drive competitive behavior, but are likely renegotiated as a result of effective competitive practices. Again, this can be seen in the non-recursive relationship between the competitive behavior constructs and the executive compensation system.

3.6 SUMMARY OF PROPOSITIONS AND ASSOCIATED HYPOTHESES

In this chapter, I put forth several propositions linking Upper-Echelon Human and Social Capital with competitive behavior constructs. Propositions are typically more abstract and conceptual than hypotheses, and, as a result, are less prone to measurement and testing (Pedhazur & Schmelkin, 1991). For these reasons, I translate the propositions to hypotheses that will be tested later in this dissertation. I present these hypotheses in Table 3.9.

Table 3.9

Proposition Number and Related Hypothesis

Proposition Number	Associated Hypothesis
1a	<i>Hypothesis 1a-1: The greater the TMT Human Capital of a firm, the greater the Competitive Activity of the firm.</i>
	<i>Hypothesis 1a-2: The greater the TMT Human Capital of a firm, the greater the Repertoire Complexity of the firm.</i>
1b	<i>Hypothesis 1b-1: The greater the BOD Human Capital of a firm, the greater the Action Significance of the firm.</i>
	<i>Hypothesis 1b-2: The greater the BOD Human Capital of a firm, the greater the Repertoire Complexity of the firm.</i>
2a	<i>Hypothesis 2a-1: The greater the Social Capital between the CEO and TMT, the greater the Repertoire Complexity of the firm.</i>
	<i>Hypothesis 2a-2: The greater the Social Capital between the CEO and TMT, the greater the Competitive Activity of the firm.</i>
2b	<i>Hypothesis 2b-1: The greater the Social Capital between the CEO and BOD, the greater the Action Significance of the firm.</i>
	<i>Hypothesis 2b-1: The greater the Social Capital between the CEO and BOD, the greater the Repertoire Complexity of the firm.</i>
3	<i>Hypothesis 3: When the executive Human Capital of the firm interacts with a firm's executive Organizational Social Capital, a firm will demonstrate more Competitive Intensity.</i>
4a	<i>Hypothesis 4a-1: Higher levels of bonus pay will strengthen the relationship between Human Capital and Competitive Activity.</i>
	<i>Hypothesis 4a-2: Higher levels of bonus pay will strengthen the relationship between Human Capital and Repertoire Complexity.</i>

Table 3.9 continued

Proposition Number	Associated Hypothesis
4b	<i>Hypothesis 4b-1: Higher levels of incentive pay will strengthen the relationship between Human Capital and Action Significance.</i>
	<i>Hypothesis 4b-2: Higher levels of incentive pay will strengthen the relationship between Human Capital and Repertoire Complexity.</i>
5a	<i>Hypothesis 5a-1: Higher levels of bonus pay will strengthen the relationship between Social Capital and Repertoire Complexity.</i>
	<i>Hypothesis 5a-2: Higher levels of bonus pay will strengthen the relationship between Social Capital and Competitive Activity.</i>
5b	<i>Hypothesis 5b-1: Higher levels of incentive pay will strengthen the relationship between Social Capital and Repertoire Complexity.</i>
	<i>Hypothesis 5b-2: Higher levels of incentive pay will strengthen the relationship between Human Capital and Action Significance.</i>
6	<i>Hypothesis 6: Higher levels of Competitive Activity will result in higher firm performance.</i>
6a	<i>Hypothesis 6a: Higher levels of Repertoire Complexity will result in higher firm performance.</i>
6b	<i>Hypothesis 6b: Higher levels of Action Significance will result in higher firm performance.</i>
6c	<i>Hypothesis 6c: Higher levels of Competitive Intensity will result in higher firm performance.</i>

4.0 RESEARCH METHODS

4.1 SAMPLE

Single-industry samples are common in competitive-behavior research since each industry is believed to have its own norms and idiosyncratic manners of competing (Smith *et al.*, 2001). Incidentally, both Human Capital and compensation practices tend to differ meaningfully across industries. Recent empirical inquiry has investigated Human and Social Capital effects within the Dutch accounting industry (Pennings *et al.*, 1998) and Human Capital effects within the U.S. legal community (Hitt *et al.*, 2001). For these reasons, I limit my analysis to the U.S. pharmaceutical industry (SIC 2834).

I chose the pharmaceutical industry for several reasons. First, the pharmaceutical industry relies on Human Capital as a source of competitive advantage (McCarthy, 2003; Salazar, Hackney, & Howells, 2003; Steptoe, personal conversation, 20 February, 2004). Compared to the U.S. airline industry, the other major sample from which many competitive behavior findings are based, the U.S. pharmaceutical industry tends to place more emphasis on innovation and research and development (R&D). Hence, human factors could explain more variance in an industry that relies on creativity and innovation as a source of competitive advantage. Second, pharmaceutical firms operate in a high fixed-cost industry with high exit barriers, both of which foster rivalry (D'Aveni, 1994; Porter, 1980). Third, this industry is among the most profitable of all industries within the U.S. (Borger, 2001). Thus, there is special appeal in understanding how the most profitable of all U.S. firms compete. Fourth, I compared pharmaceuticals against

several other industries to ascertain the amount of information available regarding firms within the industry. Benchmarked against the U.S. retail, steel, automotive, and computer industries, the U.S. pharmaceutical industry has several practical attributes that make this sample more appealing for scholarly research. Most notably, the pharmaceutical industry is heavily monitored both by governmental agencies and media sources. Also, government regulations and social norms regarding health care require a certain amount of disclosure not exacted in other industries. Also, a field test of different search engines repeatedly found that more information could be had about more firms within the pharmaceutical industry compared to other industries such as automotive or steel. Since the study relied heavily on demographic variables of senior executives, compensation data, and media reporting of competitive moves, it was imperative to find an industry that could provide such information.

There are several factors that limit the effective sample size. Since I rely exclusively on secondary data, I am limited by what is reported. I gathered all of my data from publicly held firms that trade on major stock indexes (e.g., NYSE) since the Security and Exchange Commission (SEC) requires public disclosure of information (e.g., letter to shareholders, 10-K reports). In addition, the SEC requires only firms with more than 500 shareholders and \$10 million in sales to report compensation data for its top executives. Moreover, smaller firms, both public and private, do not receive equal amounts of media attention. Because I rely on news reports to code competitive behavior, my effective sample size is reduced and reflects larger pharmaceutical organizations. For these reasons, my sample consists of about 45 large, publicly traded U.S. firms.

I collected secondary data to assess the influence of the firms in my sample on the industry as a whole. The firms of the sample used for this study produced and sold 13 of the top 20 pharmaceutical products in the U.S. in 2002 (Drug Store News, 2003). These 13 drugs

comprised 20% of all drug sales in the U.S. in that given year (Drug Store News, 2003). In 2002, firms in this sample represented 10 out of the top 15 firms in total U.S. sales (Pharmaceutical Executive, 2003). On a global scale, the firms found in this sample are four of the top five most profitable of all U.S. and international pharmaceutical firms as measured by income as a percent of revenue for 2002 (Wyeth, Pfizer, Forest, and Eli Lilly) (Med Ad News, 2003). On a wider scale, firms from this sample comprise 12 out of the 50 most profitable firms measured by income as a percent of revenue (Med Ad News, 2003). From a pure revenue standpoint, firms found in this sample constitute 13 of the top global 50 firms in total revenue (Med Ad News, 2003). Moreover, these 13 large, U.S. firms comprise almost half of the total consolidated revenue for all 50 top global firms in 2002 (Med Ad News, 2003). While there are some notable absences of global major pharmaceutical firms such as Glaxo Smith Kline, Novartis, and Roche, the firms that I am able to capture do appear to play a significant role within the global pharmaceutical industry.

I collected data on these U.S. pharmaceutical firms for a three-year period beginning in 1999 and ending in 2001. This time period is important for practical and scholarly reasons. First, it is a recent time frame that major academic search engines can supply. Second, and more important, this period is indicative of the fierce competitive behavior among U.S. pharmaceutical firms (Lisa Steptoe, personal conversation, 15 February, 2003).

4.2 COMPETITIVE INTENSITY VARIABLES

As remarked earlier, a competitive move or action is the most elemental or atomic unit of a firm's competitive behavior. To create measures of a firm's competitive behavior, it is first necessary to capture and classify the specific and precise moves that a firm undertakes. The computation of measures for Competitive Propensity (Competitive Activity), Repertoire

Complexity (competitive concentration, dominance, and range), and Competitive Magnitude (action significance) are all derived from firm actions captured using the process described below.

4.2.1 Coding of Competitive Actions

I adopted several approaches to ensure that competitive actions were thoroughly captured and accurately coded. While I used previous coding approaches (Gnyawali *et al.*, 2002; Miller & Chen, 1994) as a basis for developing a list of actions and coding procedures, I took several additional steps to develop an exhaustive and comprehensive listing of competitive actions. First, I started to build a theoretically exhaustive list of competitive actions relevant to the industry by reading industry-trade publications. An additional graduate student also read multiple trade journals to assist in identifying possible actions germane to the pharmaceutical industry. Second, although most prior research focuses on externally driven actions (e.g., Chen *et al.*, 1992), more recent research clearly suggests the need for capturing both external and internal actions (Gnyawali *et al.*, 2002; Miller & Chen, 1996). Miller and Chen (1996: 435) clearly suggest that including internal and external actions would provide “a more objective means of assessing strategy.” Therefore, I developed a list of actions that included both external (e.g., new market entry/exit) and internal (e.g. internal restructuring) moves. Finally, I wished to capture actions in a fine-grained manner so that I could classify them in meaningful ways (e.g., marketing versus human-resource moves).

Since competitive actions are largely industry-specific, I took several additional steps to ensure that the list of actions was highly relevant to the pharmaceutical industry. First, using purposeful sampling (Seidman, 1998), I reached several high level functional managers who

could provide diverse views in regard to the competitive nature of the industry and types of actions undertaken by firms. Specifically, I conducted five separate 45-minute qualitative interviews and five follow up interviews with managers responsible for various functions (e.g., public relations, manufacturing, sales, and research and development). A demographic summary profile of those managers is provided in Table 4.1.

Table 4.1

Demographics of Industry Contacts

<i>Position</i>	<i>Gender</i>	<i>Race</i>	<i>Firm Tenure</i>
Import Compliance Officer for Eastern Seaboard	Male	Caucasian	13.5 years
Regional Director of Hospital Relations	Female	African-American	11 years
Senior Manager of Vaccine Operations	Female	Caucasian	12 years
Western United States Director of Sales	Male	Caucasian	15 years
Sales Representative	Male	Caucasian	3 years

The average firm tenure of the respondents was 10.9 years. The standard deviation of firm tenure was 4.67. These respondents represent employees from four different publicly traded pharmaceutical firms. With the exception of the Sales Representative, all respondents worked for firms rated in the top 10 within the industry for sales.

Input from the industry experts and information from the in-depth industry research were used to develop a listing and definitions of specific moves undertaken by firms within the pharmaceutical industry. I then sent this listing of actions along with the proposed coding approach back to the managers previously interviewed. Their additional feedback was used to modify the actions and coding procedure. Using this list of competitive actions and coding approach, I and another Ph.D. student performed pilot coding. Specifically, we coded the same 100 news reports from one firm, made notes, and then discussed initial results. This pilot coding served to train us on the coding rules and also provided valuable feedback, which allowed us to further refine and finalize the coding scheme. These efforts resulted in the identification of 69 separate types of competitive actions and their definitions. Examples of competitive actions are “launching of a new product/service” and “acquiring intellectual property rights.”

Accompanying the coding classifications, I prepared a detailed coding manual. The coding list

and the coding manual are included in Appendices A, B, and C.

Using this coding manual, two coders content-analyzed all of the “Enhanced Titles” of the news reports (going into the details of the news if necessary) about the sampled firms published in the Factiva database for two years: 2000 and 2001. I field-tested several search engines with reference librarians before choosing the Factiva database. The Factiva database had several advantages. First, this database pulled from domestic (e.g., *Wall Street Journal*) and international media sources (e.g., *The London Times*). Second, this database gathered news both in major mainstream business press (e.g., *Barrons*) and, more specifically targeted industry journals (e.g., *Pharmaceutical Executive*, *Druggist*). This approach of structured content analysis is in line with prior competitive behavior research (Chen *et al.*, 1992; Ferrier *et al.*, 1999; Gnyawali *et al.*, 2002). The methodology is innovative in that competitive moves are directly identified from an extensive review of public information.

The final coding task was such that we coded every news report separately in separate physical locations. To avoid double counting news reports, we began at the beginning of the calendar year (1 January) and worked forward. The use of multiple raters, keyword identification in the database, and tracking actions on hard copy printouts also reduced double counting of actions. After both coders finished coding, we discussed and reconciled most of our differences. Overall, this process led to an inter-coder agreement above 98% for years 2000 and 2001. Disagreements were discussed with a senior faculty member who then resolved coding discrepancies. Given that the coders’ mental models and coding approaches became similar (as reflected in the 98% inter-coder agreement), the third year (1999) news reports were coded by one coder. The final three-year data set consisted of a total of 3,776 competitive actions undertaken by the sample firms (1,223 for 1999; 1,448 for 2000; and 1,105 for 2001). Of the 8,539 published news reports available on the sampled firms, about 45% contained competitive

actions. The remaining news was either a repetition of earlier actions or was descriptive and general news about the firm.

To further enhance the validity of this coding approach, I randomly selected 20 news reports and asked three industry experts to code the actions using the definitions and action listing provided. Two of the three industry experts had no prior knowledge of this coding approach and had no involvement in the construction and development of the initial coding scheme. Because of time limitations, the coders were told to assign the first 10 news reports a primary action code and a secondary action code using only the Action Definition and Coding Sheet in Appendices A and B. On the second set of 10 news reports, the respondents were asked to choose the appropriate coding assignment out of three possible alternatives. This process took 45 minutes to 1 hour. When I examined both their primary and secondary choices, all three industry contacts had 100% agreement on the first 10 news reports. Further, the industry professionals all successfully chose the appropriate action out of three possible alternatives. The exact news reports selected and the protocol used can be found in the back of Appendix C under Coding Verification. This approach provides the basis for calculating all measures of the dependent variable.

4.2.2 Competitive Propensity

I chose Competitive Activity as the variable to assess the construct of Competitive Propensity. I measured Competitive Activity as the total number of actions a firm launched in a given year. This is the most widely accepted measure addressing the competitive volume of a firm (Chen & Hambrick, 1995; Ferrier *et al.*, 1999; Hambrick *et al.*, 1996).

$$\text{Competitive Activity for firm } i: CA_i = \sum_{k=1}^{69} N_{ik}$$

where N_{ik} refers to the number of actions of the k -th type that firm i undertook in a given year.

4.2.3 Repertoire Complexity

Three variables capture the construct domain of Repertoire Complexity. They are Competitive Range, Competitive Concentration, and Competitive Dominance. I adopt these measures based on earlier research into Repertoire Complexity by Miller and Chen (1996). From these individual complexity scores, I generate a single composite complexity score.

4.2.3.1 Competitive Range

I measured Competitive Range (R) by counting the different types of actions, A_{ijt} , that a pharmaceutical firm launches in a given year. All indexes are based on the number of actions in each of the j classifications (1 to 69) for each of the i pharmaceutical firms in year t . For instance, in a given year, a firm may launch only 6 different types of actions. Accordingly, their range score would be 6. Of course, the higher the number is, the greater the Repertoire Complexity of the firm is. Here's the formula:

$$R = \text{count } (A_{ijt}).$$

4.2.3.2 Competitive Concentration

I measured Competitive Concentration by computing a concentration index. The concentration index (C) captures the numerical emphasis on the most commonly employed types of actions. A firm with a high concentration score indicates that a firm continually emphasizes a few specific actions and lacks Repertoire Complexity. The C index is based on the standard deviation, S_{it} , of the standard scores across the types of actions for a pharmaceutical firm (i) in a given year (t). This standard deviation is then divided by the total number of actions, N_{it} , for that firm in a given year. This approach follows previous measures developed by Miller and Chen (1996). It is important to note that the index score can be converted to a natural log to meet assumptions required of OLS regression.

$$C_{it} = \ln (S_{it}/N_{it})$$

Note that the C index is an inverse measure of competitive complexity. The lower the C score, the more complex, varied, and sophisticated the repertoire.

4.2.3.3 Competitive Dominance

I measured Competitive Dominance by computing a dominance index. The dominance or D index is based on the number of actions in a firm's most emphasized action category in a given year. The D index is believed to be a "narrower" score of complexity than the previously described C index (Miller & Chen, 1996). The D index is then the total number of actions in the j action category with the highest number of actions for a given drug firm (i) in a given year (t),

$\max z_{ijt}$, divided by the total number of actions taken by that firm in that year, N_{it} . Again, the natural log function could be applied to meet normality distributions of OLS regression.

$$D_{it} = \ln ([\max z_{ijt}] / N_{it}).$$

Like the C score, a lower D score suggests higher Repertoire Complexity.

Correlations of these three indexes appear to indicate that all three measures do indeed, tap the same construct of complexity. However, of the three measures, the Range index seems to tap a slightly different dimension of a firm's competitive complexity. For instance, a firm may have a large range of actions (high R score), but choose to emphasize a select few moves (high C and R scores). The correlation matrix from the single study (Miller & Chen, 1996) that examined a firm's competitive simplicity (the inverse of complexity) is reproduced in Table 4.2.

Table 4.2

Reproduced Complexity Correlation Matrix (Miller & Chen, 1996)

Complexity Variable	1	2	3
1. Concentration	1.00		
2. Dominance	.89	1.00	
3. Range	.61	.44	1.00

4.2.3.4 Composite Complexity Score

I computed a composite complexity score using the measures of the following three variables: Competitive Concentration, Competitive Range, and Competitive Dominance. To generate this composite complexity score, I standardized the index scores of Competitive Concentration, Competitive Range, and Competitive Dominance. Standardizing scores transforms the mean to 0 and the standard deviation to 1 for all measures of Competitive Concentration, Competitive Range, and Competitive Dominance. This is necessary; otherwise

the standard deviations of unstandardized scores would determine the weighting of the composite score. I then added these scores to arrive at a single composite complexity score.

4.2.4 Competitive Magnitude

I chose Action Significance as the variable to assess the construct of Competitive Magnitude. Other researchers use this variable to assess magnitude (e.g., Hambrick *et al.*, 1996). Whereas previous studies have used graduate students or coders to assess action significance (Hambrick *et al.*, 1996), I use high-level managers within the pharmaceutical industry to simply rate the extent to which each competitive action is “significant.” This approach should bolster the validity and confidence in the rating of actions. Capturing the essence of firm competitiveness (Chen, 1996; D’Aveni, 1994; Porter, 1980; Smith & Grimm, 1997; Smith *et al.*, 2001), I asked the pharmaceutical contacts to rate action categories on their action significance, which I define as follows:

Involves the worth and consequences associated with a competitive move. Significant actions create value to the firm. Significant moves are instrumental in generating higher profits and a competitive advantage. Low action significance indicates that the launching of the move provided no or little benefit to the organization. Conversely, high action significance indicates that this action is crucial, critical, and central to a profit and market share advantage.

I asked managers to rate each of the 69 actions on a 5-point Likert scale to assess the significance of a move. I provided scale anchors for these high-level managers to assist in their orientation towards the scale. I include the exact protocol, assessment sheets, and anchors in Appendix D. I used the mean rater score, per item, to assign each action listing a significance score. An Action Significance score corresponded to each move a firm took in a given year. An annual Action Significance score was computed by adding the Action Significance ratings for all

moves that a firm undertook in a given year divided by the total number of moves a firm launched in a given year.

$$\text{Action Significance} = \sum_{k=1}^{69} AS_{ik} / N_{it},$$

where AS refers to the mean score for a given action of the k^{th} type (1 to 69) that firm i undertook in year t . N refers to the total number of actions firm i took in year t .

To capture the agreement of the pharmaceutical professionals regarding the significance of action moves, I calculated an agreement index: r_{wg} . The following formula is used to compute an r_{wg} score:

$$r_{wg} = 1 - s_x^2 / s_{EU}^2,$$

where s_x^2 is the variance of the respondents' ratings and s_{EU}^2 is the variance of uniformly distributed error. For a 5-category Likert scale, the $s_{EU}^2 = 2.0$ (Lindell & Brandt, 1999). This measure is preferable over other measures of agreement, such as Cohen's Kappa coefficient, which is used only for categorical scaling (e.g., yes or no to reflect the occurrence of an event). The average r_{wg} for the five managers across all 69 items was .664. This number reflects moderate to high agreement given that the r_{wg} is sensitive to number of raters. The average standard deviation per assessment on the 5-point Likert scale was .775. Given that purposeful sampling was used to target a diverse array of pharmaceutical professionals from different business disciplines, this number is within expectations and indicates adequate agreement on the action items.

4.2.5 Composite Competitive Intensity Score

I computed a composite Competitive Intensity score using the measures of the following variables: Competitive Activity, Repertoire Complexity (composite score of Competitive Concentration, Range, and Dominance), and Action Significance. To generate this composite Competitive Intensity score, I standardized the scores for the indexes and measures of Competitive Activity and Action Significance. The composite score of Repertoire Complexity was previously computed. Standardizing scores transforms the means to 0 and the standard deviation to 1 for all scores of Competitive Activity and Action Significance. This is necessary, otherwise the standard deviations of unstandardized scores would determine the weighting of the composite score. I then summed these scores (Competitive Activity, Repertoire Complexity, and Action Significance) to arrive at a single composite Competitive Intensity score.

4.2.6 Summary of Dependent Constructs, Variables, and Measures

I have summarized the information about dependent constructs, variables, and measures in Table 4.3.

Table 4.3

Summary of Dependent Constructs, Variables, and Measures

Construct	Variable	Measure
Competitive Propensity	Competitive Activity	$i: CA_i = \sum_{k=1}^{69} N_{ik}$ <p>where N_{ik} refers to the number of actions of the k-th type that firm i undertook in a given year.</p>
Repertoire Complexity	Competitive Concentration	$C_{it} = \ln (S_{it}/N_{it})$
	Competitive Range	$R_{it} = \text{count} (A_{ijt})$
	Competitive Dominance	$D_{it} = \ln ((\max z_{ijt})/ N_{it})$.
		Composite score consisting of the aggregate of the individual measures of Repertoire Complexity (C , R , & D)
Competitive Magnitude	Action Significance	$\text{Action Significance} = \sum_{k=1}^{69} AS_{ik} / N_{it}$ <p>where AS refers to the mean significance score for a given action of the k^{th} type (1 to 69) that firm i undertook in year t. N refers to the total number of actions firm i took in year t.</p>
Competitive Intensity	Competitive Intensity	Composite score consisting of the aggregate of Competitive Activity, complexity composite measure, and action significance

4.3 INDEPENDENT VARIABLES

4.3.1 Human Capital

There are two widely accepted variables of Human Capital: tenure and education. Tenure has two important sub-dimensions: firm and industry tenure. Firm tenure is an indicator of firm-specific Human Capital (Buchholtz *et al.*, 2003). Industry tenure reflects industry-specific

Human Capital (Pennings *et al.*, 1998). Finally, both quality and quantity of education have been used to assess more general aspects of Human Capital (Hitt *et al.*, 2001; Pennings *et al.*, 1998). These are addressed, in turn, below.

4.3.1.1 Firm-Specific Human Capital

I chose firm tenure as the variable to assess the construct of firm-specific Human Capital. I measured and operationalized the variable of firm tenure by counting the number of years an executive or director has had with the firm as of the years 1998, 1999, and 2000, respectively. Measures of TMT and BOD firm tenure were averaged across members into a single measure. I define the TMT as all executives above the vice-president level (e.g., senior vice president, vice chairman, chief executive officer). This operationalization has been used in prior studies (Hambrick *et al.*, 1996; Michel & Hambrick, 1992). This approach yields a more complete group than if only inside directors are included (e.g., Finkelstein & Hambrick, 1990) but a more restrictive group than if all officers are included (e.g., Wagner, Pfeffer, & O'Reilly, 1984). Capturing the TMT in this manner usually results in a team size between 5 and 8 with a standard deviation usually between 2.00 and 3.00 (Michel & Hambrick, 1992; Wiersema & Bantel, 1993). Based on reasoning identified by Buchholtz *et al.*, (2003), I took the log of years since the effect of firm tenure tends to have diminishing returns. For instance, the marginal impact of 5 years of service is higher when those years span the 2nd–7th years compared with the 25th–30th years of tenure (Buchholtz *et al.*, 2003).

4.3.1.2 Industry-Specific Human Capital

Due to data unavailability, I was unable to collect executive industry tenure to assess the construct of industry-specific Human Capital.

4.3.1.3 General Human Capital

Level of education, another common variable to Human Capital research, is unlikely to vary for this sample since most executives receive advanced degrees. Thus, the impetus is to find a proxy that can more finely discriminate Human Capital. I chose elite education as the variable to assess the construct of general Human Capital.

While some entry into elite undergraduate and graduate institutions is granted based on personal favor or legacy networks, most entry into U.S. elite colleges and universities is extremely competitive and decidedly merit-based. Many of the elite schools tend to screen applicants based on cognitive ability tests, such as the SAT, GMAT, or GRE. These tests are also applied with other measures of ability and motivation, such as prior Grade-Point Average (GPA) to arrive at a decision. Thus, entry into an elite undergraduate or graduate institution is a well-suited proxy for an individual's cognitive ability and general Human Capital.

Elite education has been used elsewhere as an indicator of power (Finkelstein, 1992; Halbelian & Finkelstein, 1993). Recent research has critiqued the use of elite education as a proxy of power based on poor loadings and reliability scores using factor analytic approaches (Offstein, 2003).

Recently Hitt and colleagues (2001) used quality of law school as an indicator of an attorney's Human Capital. They found widespread agreement on what schools were in an elite

class. Their Spearman rank order correlation of .85 between the *Gourman Report of Elite Law Schools* and the *U.S. News and World Report* is one indicator of this consensus.

I define elite education as those schools identified by Finkelstein (1992). His index is based on classic works by Coleman (1973), Pierson (1969), and Blau and Margulies (1974-1975) that attempted to identify the most prestigious and rigorous colleges and universities. The list is reproduced below. Based on a review of the last three years of *U.S. News and World Report* rankings, I added Carnegie Mellon University, Duke University, the University of Virginia, and the University of North Carolina, Chapel Hill. These additions are based on student selectivity scores as indicated by average SAT and GPA. This updated listing more closely approximates current *U.S. News and World Report* rankings. I acknowledge that this list is by no means exhaustive, but agree with Finkelstein (1992: 526) that the list “does appear to have considerable face validity and is similar to those used in previous studies.” See Table 4.4 for the list.

Table 4.4

Elite Colleges and Universities

Amherst College	Stanford University
Brown University	Swarthmore College
Carnegie Mellon University	United States Military Academy
Carleton University	United States Naval Academy
Cornell University	University of California, Berkeley
Dartmouth College	University of California, Los Angeles
Duke University	University of Chicago
Grinnell College	University of Michigan
Harvard University	University of North Carolina, Chapel Hill
Johns Hopkins University	University of Pennsylvania
Massachusetts Institute of Technology	University of Virginia
New York University	Wellesley University
Oberlin College	Williams College
Pomona College	Yale University
Princeton University	

I measured elite education variable by assigning a dummy variable. First, I coded undergraduate education only: 0, undergraduate school is non-elite; 1, undergraduate school is elite. Second, I coded graduate education only: 0, graduate school is non-elite; 1, graduate school is elite. Examining both undergraduate and graduate education, I assigned several dummy variables to more finely capture educational pedigree (e.g., 1, undergraduate and graduate schools are both non-elite; 2, undergraduate or graduate school (but not both) is elite; 3,

both undergraduate and graduate schools are elite). For the BOD and the TMT, I computed a proportion statistic of individuals with a given level of educational pedigree.

4.3.1.4 Composite Human Capital Score

I computed a composite Human Capital score using the measures of the following two variables: Firm Tenure and Elite Education. To generate this composite Human Capital score, I standardized the scores of Firm Tenure and Elite Education variables. Given the low variance of executives with an elite undergraduate or graduate degree, I used the measure of those with at least one elite degree in the composite score. Standardizing scores transforms the means to 0 and the standard deviation to 1 for all measures of the variables of Firm Tenure and Elite Education. This is necessary; otherwise the standard deviations of un-standardized scores would determine the weighting of the composite score. I then added these scores to arrive at a single Human Capital score.

4.3.2 Sources of Organizational Social Capital

There is precedent to use relational demography variables as indicators of social processes and relationship quality. For instance, Jackson and colleagues (1991) used attraction-selection-attrition models and Pfeffer's (1983) demography theory to argue that demographic dissimilarity influenced interpersonal processes. Examining 93 top-management teams within the banking industry, they found that dissimilarity in such demographic areas as age and tenure correlated with top management team turnover. Similarly, Tsui and O'Reilly (1989) found that differences in age, gender, and tenure between superior and subordinate dyads was related to

lower perceptions of effectiveness, less personal attraction, and increased role ambiguity.

Gender and tenure dissimilarity were the greatest predictors of perceptions of effectiveness and personal attraction. Wiersema and Bird (1993) improved inferences of external validity as they validated several of these findings with samples of top managers from Japan. In particular, they found that age and team tenure dissimilarity were significant correlates of team turnover. Other studies conducted by Tsui, Egan, & O'Reilly (1992) found that age, tenure, and gender dissimilarities impacted such outcomes as individual-level commitment, attendance behavior, and tenure intentions. Westphal and Zajac (1995) provide evidence that depending on the power differential between the CEO and the directors, the more powerful party (CEO or BOD) will attempt to fill CEO successors with individuals who are demographically similar to the more powerful party. For instance, if the current CEO is more powerful than the BOD, the succeeding CEO is more likely to be demographically similar to the current CEO. In general, researchers who use demography believe that demographic similarity is highly correlated with value congruency between two parties (Young & Bucholtz, 2002). In summary, several researchers argue that demographic differences affect social and interpersonal relationships, which, in turn, impact such individual and organizational outcomes to include turnover, attendance, commitment, and personal attraction.

While few proxies or demographic variables may be able to tap a construct as rich and broad as Social Capital, I contend that demographic variables can and do measure what Adler and Kwon describe as “sources” of Social Capital. Simply, these scholars suggest that for Social Capital to form there must be 1) opportunity 2) motivation, and 3) ability. Demographic theories described in Chapter 2 of this dissertation, such as Pfeffer's (1983) cohort theory, Byrne's (1971) similarity attraction perspective, and Zenger and Lawrence's (1989) communication theory among like peoples all support the notion that demographic differences

can directly impact the opportunity, motivation, and ability of people to engage in relationships, which are the prime sources for the formation of organizational Social Capital. Since other leading scholars suggest and use such variables as actor similarity and attitude similarity as antecedents of Social Capital (e.g., Brass & Labianca, 1999), the precedent to use demographic variables as indicators of sources of organizational Social Capital are not without support.

In an effort to further validate that these variables did, indeed, tap into the construct domain of organizational Social Capital, I contacted an expert in the field for suggestions and feedback. Specifically, I contacted Dr. Harry Van Buren, the second author of the *Academy of Management Review* article entitled, “Organizational Social Capital and Employment Practices” (Leana & Van Buren, 1999). I communicated with Dr. Van Buren via both phone and emails. Recognizing the limitations surrounding senior management research, he thought, “relational demography is a really interesting frame for Social Capital research in thinking about the ways in which people can be similar to each other” and that “certainly, demographic variables can be one marker of two people sharing different perspectives” (personal communication, 19 March, 2004, Harry Van Buren).

I chose four variables to assess sources of organizational Social Capital: age dissimilarity, tenure dissimilarity, gender dissimilarity, and functional background dissimilarity. I measured the continuous variables of age and tenure using a modified version of the Euclidean distance measure. This formula has been used in other relational demography studies (Jackson *et al.*, 1991; O’Reilly *et al.*, 1989; Westphal & Zajac, 1995). For the categorical variables of gender and functional background, I use a variant of Blau’s (1977) index of heterogeneity. In all relational demography measures, the CEO is used as the referent. Directors and members of the TMT are assessed on how demographically dissimilar they are when benchmarked against the CEO.

4.3.2.1 Age Dissimilarity

I chose Age Dissimilarity as the first variable to assess the construct of sources of organizational Social Capital. I chose to investigate age since it has been argued that generational differences are reflected in one's age. People of the same generation tend to share many non-work related experiences (e.g., marital status, children, and historical memories) (Zenger & Lawrence, 1989). All else being equal, generational differences help explain a person's beliefs and attitudes (Rhodes, 1983). Also, Hambrick and Mason (1984) even suggest a correlation between one's age and views of firm strategy.

$$\text{Age Dissimilarity} = \sum_{j=1}^n \sqrt{\left[\frac{(S_1 - S_j)^2}{n} \right]}$$

where n is the number of directors, s_i is the CEO's value on the demographic variable, and s_j was the j^{th} committee member's value on that variable. Age will be the CEO or committee member's age beginning in 1998, 1999, and 2000.

4.3.2.2 Gender Dissimilarity

I chose Gender Dissimilarity as the second variable to assess the construct of sources of organizational Social Capital. I chose to investigate gender given the prevalence of glass ceilings and a history of senior management dominated by white older males; the presence of women in senior management is likely to be related to different team dynamics. Also, there are

significant amounts of evidence that women and men communicate quite differently in work settings (Aries, 1987; Baker, 1991; Callan, 1993), which impede communication in mixed-gender groups. Furthermore, Maccoby (1990) notes that communication differences begin in adolescence and that, in general, there is social comfort when communicating with those of the same gender. I computed a $(P_i)^2$, where P_i is the proportion of CEO-board/TMT members sharing the i th category (Murray, 1989). Hence, this measure indicates the squared proportion of CEO-committee member dyads in which both individuals are of the same gender.

4.3.2.3 Tenure Dissimilarity

I chose Tenure Dissimilarity as the third variable to assess the construct of sources of organizational Social Capital. I chose to investigate tenure dissimilarity because tenure is linked to what Pfeffer (1983) terms the “cohort effect.” Similar tenure of senior management implies a cohort effect. This cohort effect indicates that individuals share similar experiences within the organization. As a result of these shared experiences, managers begin to develop similar mental models and world-views. All else being equal, individuals who share a cohort are more socially intimate than those that do not (Pfeffer, 1983).

$$\text{Tenure Dissimilarity} = \sum_{j=1}^n \sqrt{\left[\frac{(S_i - S_j)^2}{n} \right]}$$

where n is the number of directors, s_i is the CEO's value on the demographic variable, and s_j was the j^{th} committee member's value on that variable. Firm tenure was the number of years the CEO

or director has been employed by the firm as of 1998, 1999, and 2000, respectively. Both raw and LOG transformation measures were calculated.

4.3.2.4 Functional Background Dissimilarity

I chose Functional Background Dissimilarity as the fourth variable to assess the construct of sources of organizational Social Capital. I chose to investigate this variable because functional background implies similar training and experiences. This, in turn, can shape perceived organizational priorities and influences how individuals diagnose and understand organizational problems (Klein, 1998). I assigned a dummy variable to the functional area in which the executive spent the most time (e.g., finance, marketing, sales, human resources, accounting). In cases where the executive had substantial experiences in more than one category or equal amounts of time in categories, I coded the most recently assigned functional area. This approach is consistent with other TMT studies (Hambrick *et al.*, 1996). Since functional background is a categorical variable, I measured the variable of Functional Background Dissimilarity as a variant of Blau's (1977) index of heterogeneity, defined as $(P_i)^2$, where P_i is the proportion of CEO-board member dyads sharing the i^{th} category (e.g., finance, marketing, sales, human resources, accounting) (Murray, 1989). Hence, this measure indicates the squared proportion of CEO-board member dyads in which both individuals have primary experience in the same core functional area. This measure has been used in other studies that examine the relationship between the CEO and the BOD (Zajac & Westphal, 1996).

4.3.2.5 Composite Organizational Social Capital Score

I computed a composite organizational Social Capital score using the measures of the following four variables: Age Dissimilarity, Tenure Dissimilarity, Gender Dissimilarity, and Functional Background Dissimilarity. To generate this composite Human Capital score, I standardized the scores of Age Dissimilarity, Tenure Dissimilarity, Gender Dissimilarity, and Functional Background Dissimilarity. Because a lower number indicates greater similarity for age and tenure calculations, but indicates lower similarity in the functional background and gender calculations, I transformed the functional background and gender calculations by multiplying them by the constant of -1 . I then added these scores to arrive at a single organizational Social Capital score, which was adjusted based on directionality of the measures. In sum, a lower Social Capital score indicates greater similarity and a better source for Social Capital. There is particular precedent to develop a composite score since individuals tend to diagnose similarity on the basis of multiple social features (Zajac & Westphal, 1996).

4.3.3 Demographic Data Collection

Demographic data was collected via several sources to include *Dun and Bradstreet Executive Directories*, *Leadership Directory*, *Marquis Who's Who of Corporate Officers* database, letters to shareholders, 10K, and other SEC documents, and GOOGLE search. Data collection was particularly difficult because most colleges, universities, and databases keep only current executive data on file. For those reasons, SEC, 10K reports, and GOOGLE were the most productive sources of demographic information for pharmaceutical executives from 1998 through 2000. Even after using these sources, I was unable to capture executive industry tenure.

4.3.4 Summary of Independent Constructs, Variables, and Measures

I have summarized the information about independent constructs, variables, and measures in Table 4.5.

Table 4.5

Human Capital Variables and Measures

Human Capital Dimension	Variable	Measure
Firm-Specific Human Capital	Firm Tenure	Log of # of years an executive or director has had with the firm as of year 1998, 1999, and 2000
General Human Capital	Elite Education	Dummy variable as follows: 1, undergraduate and graduate schools are both nonelite; 2, undergraduate or graduate school (but not both) is elite; 3, both undergraduate and graduate schools are elite.
	Human Capital Composite	Composite score consisting of the aggregate of the individual measures of Human Capital dimensions (firm tenure and elite education)

Table 4.6

Social Capital Variables and Measures

Construct	Relational Demography Variables	Measures
Sources of Organizational Social Capital	Age Dissimilarity	$\sum_{j=1}^n \sqrt{\left[\frac{(S_i - S_j)^2}{n} \right]}$ <p>where n is the number of directors, s_i is the CEO's value on the demographic variable, and s_j was the jth committee member's value on that variable. Age will be the CEO or committee member's age beginning in 1998, 1999, and 2000.</p>
	Gender Dissimilarity	(P _i) ² , where P _i is the proportion of CEO-board member/TMT member dyads sharing the i th category
	Tenure Dissimilarity	$\sum_{j=1}^n \sqrt{\left[\frac{(S_i - S_j)^2}{n} \right]}$ <p>where n is the number of directors, s_i is the CEO's value on the demographic variable, and s_j was the jth committee member's value on that variable. Firm tenure will be the number of years the CEO or director has been employed by the firm as of 1998, 1999, and 2000, respectively.</p>
	Functional Background Dissimilarity	(P _i) ² , where P _i is the proportion of CEO-board member/TMT member dyads sharing the i th category
	Social Capital Composite	Composite score consisting of the aggregate of the individual measures of organizational social capital dimensions (age, gender, tenure, and functional background dissimilarity)

4.4 MODERATING VARIABLES

Although researchers do not often include moderating variables in Human and Social Capital research, a review of the literature suggests that moderating variables are instrumental in

understanding and predicting the effects of Human and Social Capital. Most notably, for Human and Social Capital to be of organizational significance, mechanisms are necessary to transform these unique forms of capital from a private good to a public good (Coff, 1997; Leana & Van Buren, 1999).

4.4.1 Variable Pay

4.4.1.1 Incentive Pay

The first moderating variable is incentive pay. Based on work conducted by Gray and Cannella (1997) and Miller and colleagues (2002), I measured the variable of incentive pay by computing a variable pay mix ratio, which measures the proportion of an executive's variable pay compared to his or her total pay package. Specifically, this is calculated by dividing total variable pay (e.g. bonus, total value of restricted stock granted, total value of stock options granted using the Black Scholes computation, and other incentive payouts) by the total compensation package. For TMT calculations, this ratio was averaged across the CEO and the four next highest paid executives (Henderson & Fredrickson, 2001).

4.4.1.2 Bonus Pay

The second moderating variable is executive bonus pay. I measured and operationalized bonus as lump annual sum (in dollars) (Gomez-Mejia & Balkin 1992). TMT Bonus was averaged across the CEO and the four next highest paid executives (Henderson & Fredrickson, 2001).

4.5 CONTROL VARIABLES

4.5.1 Firm Size

In general, the most significant drivers of a firm's competitive behavior are firm size (Chen & Hambrick, 1995). Firms are likely to gain economy of scale advantages that are often linked with large firms. Since this dissertation tests the importance of firm resources, it is necessary to investigate and account for effects of other firm resources previously studied in competitive behavior research. Therefore, I controlled for firm size. I measured the variable of firm size as annual sales (in dollars). The most common reflector of firm size is sales (Haleblian & Finkelstein, 1993; Wiersema & Bantel, 1992). Incidentally, firm size is also an important control variable in respect to compensation effects. Larger firms pay their executives more (Tosi, Werner, Katz, & Gomez-Mejia, 2000).

4.5.2 Organizational Slack

Organizational slack is an important variable because the other major resource that a firm has at its disposal is financial capital. When a firm has more financial capital than operating expenditures, a firm possesses organizational slack (Ferrier, 2001). Slack allows a firm to experiment with strategic innovation (Cyert & March, 1963). Further, slack is positively related to the volume of competitive moves a firm can launch (Young *et al.*, 1996). Not surprisingly, low levels of slack inhibit a firm's ability to mobilize and deploy resources necessary for Competitive Activity (Ferrier, 2001; Pettigrew, 1992; Young *et al.*, 1996). In a fairly comprehensive study conducted by Ferrier (2001) that encompassed several industries this measure of slack was a rather strong and significant predictor of both attack volume ($\beta = 2.82$,

$p < .10$) and attack duration ($\beta = .17, p < .10$). Therefore, I chose organizational slack as the second control variable. I measured the variable of organizational slack by computing an annual “quick ratio” for a firm. The “quick ratio” is computed by taking a firm’s current assets minus its inventory and dividing it by current liabilities.

4.5.3 Performance Measures

Firm performance is a multi-dimensional construct. Accordingly, I adopted three measures of firm performance: net income, return on assets, change in sales. Net income equals the excess of total revenues over total expenses. Also called net earnings or net profit, this measure is a global indicator of the profitability of a firm. The second measure of performance is return-on-assets (ROA). This measure is an indicator of how efficiently and profitably a firm uses its assets to generate their profits (Harrison & Horngren, 2001). The third performance measure is change in sales, which is the percent change by year of total sales. These measures are common in strategy research (e.g., Haleblan & Finkelstein, 1993; Li & Simerly, 1998). I also collect data regarding the amount and kind of blockbuster drugs a firm launched between 1998-2001.

5.0 ANALYSIS

I used Ordinary Least Squares (OLS) Regression to test my hypotheses. The main assumptions of OLS Regression are (1) the relationship between the independent and dependent measures are linear; (2) unless specified, additive properties are assumed (there are no interactions); and (3) variance of errors is the same at all levels of X (homoscedasticity). To verify these assumptions, I often plotted both the data and residual plots. This allowed me to gauge the normality of the distribution, to identify outliers that may be abnormally affecting the beta coefficients, and to verify that error terms are scattered evenly around the mean of residuals. This is particularly important in small samples, where an extreme outlier can greatly influence a beta coefficient.

I used a time-lagged regression procedure to test the relationships between variables. For instance, I regressed the dependent variable in year 2000 onto independent and control variables in year 1999. This approach demonstrates time precedence and improves causality inferences of correlational designs (Pedhazur & Schmelkin, 1991). To preserve a reasonable sample size and to limit missing data, for most of my analysis I use average measures of all variables. In summary, I analyzed separately in a year-by-year fashion and also as a single data set consisting of three-year averages of the measures for variables. I tend to report results from the collapsed three-year data set.

Although I used composite scores as measures of independent and dependent variables, I also analyzed how separate measures of specific variables influenced the dependent variable of

interest. My analytical approach was to test all hypotheses for statistical significance of the overall Regression model and the beta coefficients that correspond to the independent and moderating variables. I also examined the effect of the predictor variables on the dependent variables by accounting for changes in R^2 or variance explained. I also examined the size of the beta coefficients as another indicator of strength of relationship between independent and dependent variables.

5.1 RESULTS

The descriptive statistics and correlations for all major variables that are presented later in regression tables is contained in an Excel spreadsheet that I have reproduced in the 6-page Table 5.

Table 5.1 *Entire Correlation Matrix*

	Variable	Mean	S.D	1	2	3	4	5	6
1	CEO-TMT Social Capital	-0.1201	2.075	1					
2	CEO-BOD Social Capital	-0.1489	2.096	.461***	1				
3	CEO-TMT Functional Dissimilarity	0.0677	0.0976	-.633***	-.198	1			
4	CEO-Director Functional Dissimilarity	0.1111	0.1369	-.171	-.569***	0.057	1		
5	CEO-TMT Gender Dissimilarity	0.8213	0.2263	-.445**	-.352*	0.187	0.199	1	
6	CEO-BOD Gender Dissimilarity	0.8117	0.1924	-.449**	-.567***	0.196	0.12	.556***	1
7	CEO-TMT Tenure Dissimilarity	17.3171	13.574	.626***	.348*	-.166	-.045	0.102	-.217
8	CEO-TMT Age Dissimilarity	16.3294	9.3051	.609***	0.056	-.157	0.05	0.077	0.005
9	CEO-BOD Age Dissimilarity	26.5333	10.1033	0.131	.617***	.111	-.227	-.149	-.086
10	CEO-BOD Tenure Dissimilarity	24.56919	21.8913	.294+	.511***	-.079	0.062	0.113	.108
11	TMT Human Capital	-0.028	1.3207	.502***	.384**	-.314*	0.085	-.022	-.182
12	BOD Human Capital	.0320	1.4209	.376*	.398*	-.036	-0.029	0.216	-0.055
13	BOD Tenure	0.9504	0.1755	0.187	.419**	0.16	0.049	0.142	-.015
14	TMT Tenure	1.0283	0.2338	.483**	.495**	-.111	0.103	-.008	-.394**
15	CEO Tenure	1.0474	0.3241	0.133	0.253	0.043	0.149	-.019	-.086
16	Competitive Intensity	0.01234	3.6221	.488***	0.153	-.300	-0.197	0.118	-.144
17	Competitive Activity	25.1833	33.1941	.510***	.312*	-.259+	-.334*	-0.051	-.297*
18	Action Significance	-0.05103	0.7246	-.180	.257+	0.049	-.171	0.006	-.170
19	Repertoire Complexity	0.023685	2.6246	-.455**	-.013	.322*	0.095	-.208	0.004
20	Competitive Concentration	0.061971	0.92819	-.453**	-.036	.344*	0.093	-0.195	0.029
21	Competitive Dominance	0.11605	0.96742	-.363*	0.148	.369*	-.034	-.295	-.143
22	Competitive Range	9.05448	8.76538	.526***	.340*	-.313*	-.324*	-.035	-.292*
23	Change in Sales	27.6426	38.2755	-.236	-.384*	0.045	0.036	0.016	.340*
24	Total Sales	4238.891	7735.173	.463**	.285+	-.199	-.294+	-.076	-.317*
25	Net Income	778.2564	1652.783	.505***	.291*	-.224	-.297+	-0.078	-.302+
26	Return on Assets	5.0058	12.224	0.246	0.246	0.018	0.124	-.081	-.404*
27	Organizational Slack	3.6325	3.83976	-.178	-.046	0.073	0.077	-.424**	-.155
28	TMT Incentive Pay	0.70354	0.18761	0.18	0.218	.219	-.177	0.253	0.013
29	TMT Bonus Pay	339.154	336.604	.418**	.399**	-.232	-.350**	0.029	-.328
30	CEO Incentive Pay	0.72403	0.22228	0.241	0.179	-.284+	-.165	0.128	-0.028
31	Int Term (CEO tenure X CEO incentive)	0.76792	0.35796	.271+	0.212	.192	0.053	0.092	-0.031
32	Int Term (CEO-TMT SC X CEO-TMT Incentive)	-.12209	1.3347	-.966***	-.374*	.492***	0.206	.351*	.348*
33	Int Term (CEO-TMT SC X CEO-TMT Bonus)	299.3227	955.612	-.730***	-.321*	.293+	.279+	0.175	.307*
34	Int Term (TMT Human Capital X TMT Bonus)	163.965	549.869	.474**	.283+	-.176	-0.054	0.052	-.146
35	Int Term (TMT Human Capital X BOD Human Capital)	-1.00974	2.72457	.277+	-.073	-.140	.336*	0.024	0.027

Table 5.1 continued

	Variable	Mean	S.D	7	8	9	10	11	12
1	CEO-TMT Social Capital	-0.1201	2.075						
2	CEO-BOD Social Capital	-0.1489	2.096						
3	CEO-TMT Functional Dissimilarity	0.0677	0.0976						
4	CEO-Director Functional Dissimilarity	0.1111	0.1369						
5	CEO-TMT Gender Dissimilarity	0.8213	0.2263						
6	CEO-BOD Gender Dissimilarity	0.8117	0.1924						
7	CEO-TMT Tenure Dissimilarity	17.3171	13.574	1					
8	CEO-TMT Age Dissimilarity	16.3294	9.3051	.310*	1				
9	CEO-BOD Age Dissimilarity	26.5333	10.1033	-.047	0.11	1			
10	CEO-BOD Tenure Dissimilarity	24.56919	21.8913	.574***	0.099	0.094	1		
11	TMT Human Capital	-0.028	1.3207	.489**	.287+	.259+	.475***	1	
12	BOD Human Capital	.0320	1.4209	.568***	.390*	.302+	.526***	.584***	1
13	BOD Tenure	0.9504	0.1755	.470***	0.194	.366*	.615***	.559***	.805***
14	TMT Tenure	1.0283	0.2338	.674***	0.199	0.149	.681***	.700***	.577***
15	CEO Tenure	1.0474	0.3241	.319*	0.034	-.041	.643***	.502***	0.252
16	Competitive Intensity	0.01234	3.6221	.493***	.313*	-.058	0.082	0.167	.364*
17	Competitive Activity	25.1833	33.1941	.464***	.312*	-.068	0.14	0.252	0.237
18	Action Significance	-0.05103	0.7246	0.021	-0.163	.265+	-.028	-.049	0.228
19	Repertoire Complexity	0.023685	2.6246	-.472***	-.339*	0.112	-.067	-.139	-.356*
20	Competitive Concentration	0.061971	0.92819	-.405**	-.318*	0.083	-.066	-.106	-.383*
21	Competitive Dominance	0.11605	0.96742	-.379*	-.313*	0.159	-.027	-.102	-.324+
22	Competitive Range	9.05448	8.76538	.475***	.325*	0.043	0.137	0.259+	.273*
23	Change in Sales	27.6426	38.2755	-.285+	-0.07	-.058	-.391*	-.285+	-.501**
24	Total Sales	4238.891	7735.173	.444**	.271+	-0.11	0.143	0.218	0.173
25	Net Income	778.2564	1652.783	.444**	.317*	-.137	0.142	0.199	0.138
26	Return on Assets	5.0058	12.224	0.229	0.162	-.036	.269+	0.134	0.047
27	Organizational Slack	3.6325	3.83976	-.430**	-.243	-.021	-.214	-.003	-.413*
28	TMT Incentive Pay	0.70354	0.18761	.411**	0.17	0.181	0.142	-.347*	.549***
29	TMT Bonus Pay	339.154	336.604	.573***	0.124	-.023	0.24	.332*	.365*
30	CEO Incentive Pay	0.72403	0.22228	.378*	0.077	0.096	0.107	.391*	.544**
31	Int Term (CEO tenure X CEO incentive)	0.76792	0.35796	.452**	0.071	-.037	.498***	.559***	.460***
32	Int Term (CEO-TMT SC X CEO-TMT Incentive)	-.12209	1.3347	-.612***	-.658**	-.015	-.273+	-.449**	-.376*
33	Int Term (CEO-TMT SC X CEO-TMT Bonus)	299.3227	955.612	.617***	-.487***	0.088	-.238	-.392*	-.301+
34	Int Term (TMT Human Capital X TMT Bonus)	163.965	549.869	.667***	0.198	-.048	.449**	.698***	.443**
35	Int Term (TMT Human Capital X BOD Human Capital)	-1.00974	2.72457	0.127	.374*	0.147	0.045	0.2	0.226

Table 5.1 continued

	Variable	Mean	S.D	13	14	15	16	17	18
1	CEO-TMT Social Capital	-0.1201	2.075						
2	CEO-BOD Social Capital	-0.1489	2.096						
3	CEO-TMT Functional Dissimilarity	0.0677	0.0976						
4	CEO-Director Functional Dissimilarity	0.1111	0.1369						
5	CEO-TMT Gender Dissimilarity	0.8213	0.2263						
6	CEO-BOD Gender Dissimilarity	0.8117	0.1924						
7	CEO-TMT Tenure Dissimilarity	17.3171	13.574						
8	CEO-TMT Age Dissimilarity	16.3294	9.3051						
9	CEO-BOD Age Dissimilarity	26.5333	10.1033						
10	CEO-BOD Tenure Dissimilarity	24.56919	21.8913						
11	TMT Human Capital	-0.028	1.3207						
12	BOD Human Capital	.0320	1.4209						
13	BOD Tenure	0.9504	0.1755	1					
14	TMT Tenure	1.0283	0.2338	.700***	1				
15	CEO Tenure	1.0474	0.3241	.471**	.629**	1			
16	Competitive Intensity	0.01234	3.6221	0.051	.383*	0.007	1		
17	Competitive Activity	25.1833	33.1941	0.061	.437**	0.112	.890**	1	
18	Action Significance	-0.05103	0.7246	0.177	0.187	-.185	.343*	0.128	1
19	Repertoire Complexity	0.023685	2.6246	-.001	-.290+	-.008	-.965	-.813***	-.157
20	Competitive Concentration	0.061971	0.92819	-.030	-0.243	0.071	-.912***	-.681***	-.114
21	Competitive Dominance	0.11605	0.96742	0.099	-.139	-0.02	-.852***	-.629***	-.066
22	Competitive Range	9.05448	8.76538	0.082	.419**	0.071	.911***	.962***	0.128
23	Change in Sales	27.6426	38.2755	-.386*	-.396*	-.060	-.085	-.161	.090
24	Total Sales	4238.891	7735.173	0.05	.398**	0.101	.778***	.893***	0.142
25	Net Income	778.2564	1652.783	-.016	.387*	0.065	.741***	.891***	0.088
26	Return on Assets	5.0058	12.224	0.194	.520***	0.024	.274+	.439***	0.003
27	Organizational Slack	3.6325	3.83976	-.327*	-.219	0.195	-.557	-.396**	-.324*
28	TMT Incentive Pay	0.70354	0.18761	.330*	.397**	0.17	.712***	.540***	.361*
29	TMT Bonus Pay	339.154	336.604	0.106	.496***	0.167	.790***	.835***	.256+
30	CEO Incentive Pay	0.72403	0.22228	0.245	.332*	0.138	.630***	.491***	0.207
31	Int Term (CEO tenure X CEO incentive)	0.76792	0.35796	.440**	.615***	.766***	.456**	.416**	0.044
32	Int Term (CEO-TMT SC X CEO-TMT Incentive)	-.12209	1.3347	-.138	-.452**	-.156	-.538	-.604***	0.122
33	Int Term (CEO-TMT SC X CEO-TMT Bonus)	299.3227	955.612	-.038	-.418**	-.170	-.590***	-.737***	0.073
34	Int Term (TMT Human Capital X TMT Bonus)	163.965	549.869	.372*	.533***	.399*	0.248	.384*	-.082
35	Int Term (TMT Human Capital X BOD Human Capital)	-1.00974	2.72457	0.248	.327*	0.086	0.251	0.119	0.094

Table 5.1 continued

	Variable	Mean	S.D	19	20	21	22	23	24
1	CEO-TMT Social Capital	-0.1201	2.075						
2	CEO-BOD Social Capital	-0.1489	2.096						
3	CEO-TMT Functional Dissimilarity	0.0677	0.0976						
4	CEO-Director Functional Dissimilarity	0.1111	0.1369						
5	CEO-TMT Gender Dissimilarity	0.8213	0.2263						
6	CEO-BOD Gender Dissimilarity	0.8117	0.1924						
7	CEO-TMT Tenure Dissimilarity	17.3171	13.574						
8	CEO-TMT Age Dissimilarity	16.3294	9.3051						
9	CEO-BOD Age Dissimilarity	26.5333	10.1033						
10	CEO-BOD Tenure Dissimilarity	24.56919	21.8913						
11	TMT Human Capital	-0.028	1.3207						
12	BOD Human Capital	.0320	1.4209						
13	BOD Tenure	0.9504	0.1755						
14	TMT Tenure	1.0283	0.2338						
15	CEO Tenure	1.0474	0.3241						
16	Competitive Intensity	0.01234	3.6221						
17	Competitive Activity	25.1833	33.1941						
18	Action Significance	-0.05103	0.7246						
19	Repertoire Complexity	0.023685	2.6246	1					
20	Competitive Concentration	0.061971	0.92819	.961***	1				
21	Competitive Dominance	0.11605	0.96742	.944***	.924***	1			
22	Competitive Range	9.05448	8.76538	-.851***	-.740***	-.657***	1		
23	Change in Sales	27.6426	38.2755	0.016	-.074	-.036	-.107	1	
24	Total Sales	4238.891	7735.173	-.702***	-.572***	-.543***	.851***	-.184	1
25	Net Income	778.2564	1652.783	-.642***	-.503***	-.477**	.819***	-.154	.930***
26	Return on Assets	5.0058	12.224	-.174	-.099	0.011	.381*	-.535***	.402**
27	Organizational Slack	3.6325	3.83976	.555***	.561***	.442**	-.446**	0.243	-.367*
28	TMT Incentive Pay	0.70354	0.18761	-.709***	-.712***	-.652***	.600***	-.002	.447**
29	TMT Bonus Pay	339.154	336.604	-.710***	-.606	-.551***	.839***	-.327*	.762***
30	CEO Incentive Pay	0.72403	0.22228	-.645***	-.638**	-.624***	.528***	-.066	.417**
31	Int Term (CEO tenure X CEO incentive)	0.76792	0.35796	-.456**	-.416**	-.463**	.405**	-.062	.338*
32	Int Term (CEO-TMT SC X CEO-TMT Incentive)	-.12209	1.3347	.505***	.408**	.392*	-.588***	0.238	-.560***
33	Int Term (CEO-TMT SC X CEO-TMT Bonus)	299.3227	955.612	.529***	.386*	.389*	.716***	0.181	-.677***
34	Int Term (TMT Human Capital X TMT Bonus)	163.965	549.869	-.213	-.083	-0.145	.368*	-.323*	.345*
35	Int Term (TMT Human Capital X BOD Human Capital)	-1.00974	2.72457	-.264+	-.349*	-.238	0.202	0.259	0.093

Table 5.1 continued

	Variable	Mean	S.D	25	26	27	28	29	30
1	CEO-TMT Social Capital	-0.1201	2.075						
2	CEO-BOD Social Capital	-0.1489	2.096						
3	CEO-TMT Functional Dissimilarity	0.0677	0.0976						
4	CEO-Director Functional Dissimilarity	0.1111	0.1369						
5	CEO-TMT Gender Dissimilarity	0.8213	0.2263						
6	CEO-BOD Gender Dissimilarity	0.8117	0.1924						
7	CEO-TMT Tenure Dissimilarity	17.3171	13.574						
8	CEO-TMT Age Dissimilarity	16.3294	9.3051						
9	CEO-BOD Age Dissimilarity	26.5333	10.1033						
10	CEO-BOD Tenure Dissimilarity	24.56919	21.8913						
11	TMT Human Capital	-0.028	1.3207						
12	BOD Human Capital	.0320	1.4209						
13	BOD Tenure	0.9504	0.1755						
14	TMT Tenure	1.0283	0.2338						
15	CEO Tenure	1.0474	0.3241						
16	Competitive Intensity	0.01234	3.6221						
17	Competitive Activity	25.1833	33.1941						
18	Action Significance	-0.05103	0.7246						
19	Repertoire Complexity	0.023685	2.6246						
20	Competitive Concentration	0.061971	0.92819						
21	Competitive Dominance	0.11605	0.96742						
22	Competitive Range	9.05448	8.76538						
23	Change in Sales	27.6426	38.2755						
24	Total Sales	4238.891	7735.173						
25	Net Income	778.2564	1652.783	1					
26	Return on Assets	5.0058	12.224	.459**	1				
27	Organizational Slack	3.6325	3.83976	-.316*	-.259	1			
28	TMT Incentive Pay	0.70354	0.18761	.407**	0.001	-.397**	1		
29	TMT Bonus Pay	339.154	336.604	.697***	.421**	-.420**	.591***	1	
30	CEO Incentive Pay	0.72403	0.22228	.372*	-.028	-.213	.900***	.565***	1
31	Int Term (CEO tenure X CEO incentive)	0.76792	0.35796	.286+	-.003	-.025	.701***	.468**	.719**
32	Int Term (CEO-TMT SC X CEO-TMT Incentive)	-.12209	1.3347	-.620***	-.279+	0.251	-.183	-.482***	-.215
33	Int Term (CEO-TMT SC X CEO-TMT Bonus)	299.3227	955.612	-.787	-.315*	0.233	-.286+	-.603***	-.266+
34	Int Term (TMT Human Capital X TMT Bonus)	163.965	549.869	.385*	0.194	-.167	0.207	.458**	0.181
35	Int Term (TMT Human Capital X BOD Human Capital)	-1.00974	2.72457	0.032	0.151	-.207	.387*	0.035	.316*

Table 5.1 continued

	Variable	Mean	S.D					
1	CEO-TMT Social Capital	-0.1201	2.075					
2	CEO-BOD Social Capital	-0.1489	2.096					
3	CEO-TMT Functional Dissimilarity	0.0677	0.0976					
4	CEO-Director Functional Dissimilarity	0.1111	0.1369					
5	CEO-TMT Gender Dissimilarity	0.8213	0.2263					
6	CEO-BOD Gender Dissimilarity	0.8117	0.1924					
7	CEO-TMT Tenure Dissimilarity	17.3171	13.574					
8	CEO-TMT Age Dissimilarity	16.3294	9.3051					
9	CEO-BOD Age Dissimilarity	26.5333	10.1033					
10	CEO-BOD Tenure Dissimilarity	24.56919	21.8913					
11	TMT Human Capital	-0.028	1.3207					
12	BOD Human Capital	.0320	1.4209					
13	BOD Tenure	0.9504	0.1755					
14	TMT Tenure	1.0283	0.2338					
15	CEO Tenure	1.0474	0.3241					
16	Competitive Intensity	0.01234	3.6221					
17	Competitive Activity	25.1833	33.1941					
18	Action Significance	-0.05103	0.7246					
19	Repertoire Complexity	0.023685	2.6246					
20	Competitive Concentration	0.061971	0.92819					
21	Competitive Dominance	0.11605	0.96742					
22	Competitive Range	9.05448	8.76538					
23	Change in Sales	27.6426	38.2755					
24	Total Sales	4238.891	7735.173					
25	Net Income	778.2564	1652.783					
26	Return on Assets	5.0058	12.224					
27	Organizational Slack	3.6325	3.83976					
28	TMT Incentive Pay	0.70354	0.18761					
29	TMT Bonus Pay	339.154	336.604					
30	CEO Incentive Pay	0.72403	0.22228					
31	Int Term (CEO tenure X CEO incentive)	0.76792	0.35796	1				
32	Int Term (CEO-TMT SC X CEO-TMT Incentive)	-.12209	1.3347	-.252	1			
33	Int Term (CEO-TMT SC X CEO-TMT Bonus)	299.3227	955.612	-.304+	.839***	1		
34	Int Term (TMT Human Capital X TMT Bonus)	163.965	549.869	.390*	-.528***	-.667***	1	
35	Int Term (TMT Human Capital X BOD Human Capital)	-1.00974	2.72457	0.25	-.163	0.004	-.167***	1

5.1.1 Hypothesis 1a-1

The greater the TMT Human Capital of a firm, the greater the Competitive Activity of the firm.

Table 5.2 displays the results from the OLS regression for Hypothesis 1a-1. Because the control variable of firm size accounted for over 70% of the variance explained of firm Competitive Activity, I chose to remove the size control variable from the regression equation to assess the impact of TMT Human Capital while controlling for organizational slack. To provide a more comprehensive relationship between the variables, I decided to average all years of Competitive Activity (1999-2001) and all years of the control variables and the independent variable. Table 5.2 then presents the average of a 3-year time period between the sets of variables.

Model 1 is the base model and accounts for only control variables. Model 2 reflects the addition of the independent variable. In this model, TMT Human Capital is non-significant and provides little explanatory power to the model. Model 3 illustrates the influence of TMT Human Capital when the control variable of firm size is omitted. Here TMT Human Capital has significant and positive effects, thereby suggesting that as TMT Human Capital increases, a firm's Competitive Activity also increases. Models 4 and 5 display the impact of firm-specific Human Capital, which is assessed through the relational demography variable of TMT firm tenure. In model 4, TMT firm tenure has positive, but non-significant results. Model 5 reflects the impact of TMT firm tenure when size is omitted as a control. Under these circumstances,

TMT firm tenure is significant and enhances the explanatory power of the model in excess of 14%.

Consistent with predictions in Hypothesis 1a-1, the Human Capital of the TMT does appear to impact a firm's Competitive Activity. The extent of that impact, however, is not conclusive. When the control variable of size is entered into the regression equation, a substantive portion of variance of Competitive Activity is accounted for. Since sales can reflect both size, and, perhaps, performance, I also ran the analysis with number of employees as a size control variable. In this scenario, size explains slightly less variance, while the remaining variables of slack and TMT Human Capital explain slightly more. It is important to acknowledge that the standard errors for both TMT firm tenure and TMT Human Capital often exceed the standard errors for both firm size and slack. A methodical examination of TMT general Human Capital (educational pedigree) failed to indicate a relationship with Competitive Activity. In sum, it appears that a TMT's educational pedigree does not impact the ability of a firm to launch a high volume of competitive moves. Since the effect of both TMT Human Capital and TMT firm-specific Human Capital is both positive and significant, I find modest support for Hypothesis 1a-1, stating that higher levels of TMT Human Capital will increase a firm's Competitive Activity.

Table 5.2

Regression Results. Competitive Activity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	Model 3 (without firm size)	Model 4 (Firm Specific Human Capital)	Model 5 (Firm Specific Human Capital without size)
Firm Sales (1998-2000)	.848 (.000)***	.822 (.000)***		.815 (.000)***	
Firm Quick Ratio (1998-2000)	-.112 (.735)	-.123 (.740)	-.434 (1.280)**	-.095 (.725)	-.326 (1.254)*
TMT Human Capital (1998-2000)		.078 (2.219)	.311 (4.034)*		
TMT Firm Tenure (1998-2000)				.093 (12.616)	.413 (21.209)**
Adjusted R-Square	.797	.797	.246	.797	.299
R-Square Change		.000	.079	.001	.148
F	73.565***	49.389***	7.189**	30.122***	9.325***
N	38	38	39	39	40

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below

5.1.2 Hypothesis 1a-2

The greater the TMT Human Capital of a firm, the greater the Repertoire Complexity of the firm.

Table 5.3 displays the results from the OLS regression for Hypothesis 1a-2. Like previous analysis, the results presented reflect the average 3-year time period. Model 1 is the base model and accounts for the controls of firm size and firm slack. In model 2, the independent variable is included. While the TMT Human Capital beta coefficient is in the predicted direction it is non-significant. Model 3 illustrates the influence of TMT Human Capital when the control variable of size is removed. In this scenario, TMT Human Capital has significant and positive effects. Since a lower complexity score indicates greater Repertoire Complexity, the results suggest that as TMT Human Capital increases there is a corresponding increase in a firm's Repertoire Complexity. These results are replicated when the separate dimensions of Repertoire Complexity (i.e., Competitive Range, Concentration, and Dominance) are regressed onto TMT Human Capital.¹ While not reported here, I investigated the impact of both firm-specific Human Capital and general Human Capital on Repertoire Complexity and its related dimensions. The results of these tests indicate a significant and positive relationship between TMT firm tenure and Competitive Range (beta =.348, $p < .05$).

Table 5.3

Regression Results. Repertoire Complexity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	Model 3 (TMT Human Capital without firm size)
Firm Sales (1998-2000)	-.564 (.000)***	-.553 (.000)***	
Firm Quick Ratio (1998-2000)	.341 (.084)**	.345 (.086)**	.647 (.088)***
TMT Human Capital (1998-2000)		-.032 (.257)	-.305 (.289)*
Adjusted R-Square	.564	.552	.464
R-Square Change		.000	.079
F	24.884***	16.176***	14.841***
N	38	38	38

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below 2.0.

In summary, there is some support for Hypothesis 1a-2 that TMT Human Capital influences a firm's Repertoire Complexity. The caveat to this relationship is that it fails to clearly appear when organizational size is included as a control variable. Organizational slack, a much weaker predictor of a firm's Competitive Activity, did seem to meaningfully influence a firm's Repertoire Complexity above and beyond the impact of organizational size. The beta coefficients of organizational slack variables indicate that as firms accumulate more slack, they produce less complex repertoires.

¹ The beta coefficient for TMT Human Capital to Competitive Dominance was just outside conventional levels for significance testing.

5.1.3 Hypothesis 1b-1

The greater the BOD Human Capital of a firm, the greater the Action Significance of the firm.

This hypothesis predicted that high levels of director Human Capital would influence the Action Significance of a firm. In general, analysis revealed this relationship to be tenuous. Director Human Capital failed to adequately predict a firm's Action Significance in any of the individual time frames. Removing the control of organizational size failed to meaningfully improve the relationship between director Human Capital and Action Significance. Table 5.4 presents the regression results when the data is averaged across time periods.

Table 5.4

Regression Results. Action Significance as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
Firm Sales (1998-2000)	-.046 (.000)	-.047 (.000)	1.192
Firm Quick Ratio (1998-2000)	-.385 (.025)*	-.381 (.086)+	1.373
BOD Human Capital (1998-2000)		.012 (.080)	1.209
Adjusted R-Square	.079	.047	
R-Square Change		.000	
F	2.369	1.528	
N	33	33	

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below 2.0.

It is interesting to note that organizational size does not predict a firm's Action Significance. Of all three variables, organizational slack seems to have the strongest relationship with Action Significance. When compared to the other predictor variables, the beta coefficient of organizational slack is the largest. The negative beta coefficient suggests that as a firm

accumulates more slack, there is likelihood that the firm will engage in less significant competitive moves. In more detailed analysis, I investigated the individual dimensions of director Human Capital and their relationship on a firm's Action Significance. Here, the results seem to favor the importance of director tenure as a predictor of Action Significance but only in certain time periods. For instance, 1998 director tenure was a significant and positive predictor of year 1999 Action Significance (beta = .398, $p < .05$). For these reasons, I find little support for Hypothesis 1b-1.

5.1.4 Hypothesis 1b-2

The greater the BOD Human Capital of a firm, the greater the Repertoire Complexity of the firm.

This hypothesis predicted that the Human Capital of a firm's directors would influence the complexity of moves that a firm launches. Like the other hypotheses tested, the empirical evidence for this relationship is tenuous. Table 5.5 presents the results demonstrating the influence of BOD Human Capital on Repertoire Complexity. Model 2 illustrates that the beta coefficient is in the predicted direction, but is not significant. In addition, including BOD Human Capital fails to adequately improve the explanatory power of Model 2. When the dimensions of both the independent and dependent variables are analyzed, some interesting results do emerge. Notably, as BOD Human Capital increases, there is less likelihood that the firm concentrates on a select few competitive moves (beta = -.276, $p < .05$).

Table 5.5

Regression Results. Repertoire Complexity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
Firm Quick Ratio (1998-2000)	.625 (.092) ^{***}	.532 (.099) ^{***}	1.205
BOD Human Capital (1998-2000)		-.224 (.304)	1.205
Adjusted R-Square	.371	.394	
R-Square Change		.023	
F	19.869 ^{***}	11.419 ^{***}	
N	33	33	

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients.

In conclusion, the findings do not strongly support the relationship between BOD Human Capital and a firm's Repertoire Complexity. While BOD Human Capital does seem to impact some dimensions of Repertoire Complexity, such as Competitive Concentration, its impact on other dimensions is less pronounced. For these reasons, Hypothesis 1b-2 is not supported.

5.1.5 Hypothesis 2a-1

The greater the Social Capital between the CEO and TMT, the greater the Repertoire Complexity of the firm.

This hypothesis was the first of this dissertation to assess the influence of sources of Social Capital through relational demography variables. I predicted that, as sources for Social Capital between the CEO and the TMT increased, a firm's Repertoire Complexity would also increase. Table 5.6 displays the results of my analysis. Model 1 is the base model and accounts for only control variables. Model 2 reflects the addition of the independent variable. In this model, CEO-TMT Social Capital has a negative and non-significant effect. Model 3 illustrates the influence of CEO-TMT Social Capital when the control variable of size is removed. Here,

the effect of CEO-TMT Social Capital is negative and significant, suggesting when the CEO and TMT are more demographically dissimilar and have fewer sources of Social Capital, a firm's Repertoire Complexity actually increases. Models 4 and 5 illustrate the impact of separate demographic dissimilarity variables on Repertoire Complexity. Model 4 suggests that when the CEO and TMT have a similar functional background, the resulting Repertoire Complexity is likely to be lower. Similarly, the results in model 5 suggest that when the CEO and TMT possess similar tenure marks within a firm, the firm is less likely to engage in complex repertoires. These significant and inverse relationships do not support Hypothesis 2a-1 that states that more sources of CEO-TMT Social Capital, as evidenced by greater relational similarity, will result in greater Repertoire Complexity. In fact, the empirical evidence suggests that dissimilarity, not similarity, contributes meaningfully to a complex competitive repertoire. More detailed testing on the separate dimensions of Repertoire Complexity reinforce these findings. For instance, the effect of CEO-TMT Social Capital is negative and significant for both Competitive Concentration (beta = $-.353$, $p < .01$) and Competitive Range (beta = $-.442$, $p < .01$). For these reasons, Hypothesis 2a-1 is not supported.

Table 5.6

Regression Results. Repertoire Complexity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	Model 3 (without firm size)	Model 4 (Functional Dissim.)	Model 5 (Tenure Dissim. without firm size)
Firm Sales (1998-2000)	-.570 (.000)***	-.465 (.000)**		-.506 (.000)**	
Firm Quick Ratio (1998-2000)	.321 (.096)**	.334 (.095)**	.479 (.098)***	.347 (.081)**	.370** (.093)**
CEO-TMT Social Capital (1998-2000)		-.182 (.204)	-.416 (.191)**		
CEO-TMT Functional Dissimilarity (1998-2000)				.231 (3.219)**	
CEO-TMT Tenure Dissimilarity (1998-2000)					-.436 (.030)**
Adjusted R-Square	.550	.561	.234	.599	.311
R-Square Change		.011	.157	.042	.144
F	22.379***	15.916***	14.735***	18.891***	15.980***
N	36	36	37	37	40

+ $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$; All coefficients reported are standardized coefficients. All VIF factors were below 2.0

5.1.6 Hypothesis 2a-2

The greater the Social Capital between the CEO and the TMT, the greater the Competitive Activity of the firm.

Table 5.7 displays the results from the OLS regression for Hypothesis 2a-2. Because the control variable of firm size accounted for over 70% of the variance explained of firm Competitive Activity, I chose to remove the size control variable from the regression equation to assess the impact of sources of CEO-TMT Social Capital of a firm's Competitive Activity.

Model 1 is the base model with the control variables of firm size and slack. Model 2 presents the addition of the independent variable of sources of CEO-TMT Social Capital. Here the effect is in the inverse direction and is non-significant. Model 3 reflects the results when firm size is dropped from the model. In this scenario, sources of CEO-TMT Social Capital are significant, but in the inverse direction. As the sources of Social Capital between the CEO and TMT decline, as evidenced by greater demographic dissimilarity, there is an actual increase in firm Competitive Activity. Accounting for this Social Capital variable in Model 3 increases the explanatory power of the model by 20%. Models 4 and 5 illustrate the effects of separate demographic variables on Competitive Activity. In both models, the beta coefficients for the demographic variables are significant, but inversely related to Competitive Activity. Model 4 suggests that when the CEO and TMT have a similar functional background, they deploy fewer actions and have lower Competitive Activity. Model 5 suggests that when the CEO and the TMT share similar tenure records within a firm, the firm produces a lower volume of competitive actions. These results suggest that lower sources of Social Capital between the CEO

and the TMT, as captured in high demographic differences between the two, results in more, not less, competitive moves. Thus, Hypothesis 2a-2 is not supported.

Table 5.7

Regression Results. Competitive Activity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	Model 3 (without firm size)	Model 4 (Functional Dissim.)	Model 5 (Tenure Dissim. without firm size)
Firm Sales (1998-2000)	.856 (.000)***	.795 (.000)***			
Firm Quick Ratio (1998-2000)	-.091 (.827)	-.092 (.815)	-.324 (1.347)*	-.376 (1.337)*	-.208 (1.313)
CEO-TMT Social Capital (1998-2000)		.124 (1.609)	.473 (2.531)***		
CEO-TMT Functional Dissimilarity (1998-2000)			.348	-.258 (55.581)+	
CEO-TMT Tenure Dissimilarity (1998-2000)			.205		.476 (.402)**
Adjusted R-Square	.789	.797	.348	.180	.321
R-Square Change		.008	.205	.047	.172
F	135.746***	68.884***	10.870***	5.268**	10.441***
N	37	37	38	40	41

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below 2.0

5.1.7 Hypothesis 2b-1

The greater the Social Capital between the CEO and the BOD, the greater the Action Significance of the firm.

This hypothesis posed that as sources of Social Capital between the CEO and the BOD increased, the Action Significance of a firm's competitive repertoire would also increase. Table 5.8 displays the results from the OLS regression for Hypothesis 2b-1. Unlike previous analysis, firm size does not appear to meaningfully influence a firm's Action Significance. Model 1 is the base model with only the control variables. Note that the effect of firm size is not significant and counter to expectations. The effect of firm slack on Action Significance is significant and negative suggesting that as firms accumulate more slack they are less likely to engage in substantive and forceful competitive moves. Model 2 illustrates the inclusion of the independent variable of CEO-BOD Social Capital. Here the effect is in the inverse direction and is significant. The results in this model provide evidence that as sources of CEO-BOD Social Capital decrease, as reflected in wider demographic differences between the CEO and BOD, there is a corresponding increase in a firm's Action Significance. Models 4 and 5 display the effects of separate demographic variables on Action Significance. In both models, the beta coefficients for the demographic variables of gender and age dissimilarity are significant, but inversely related to Action Significance. Model 4 suggests that when the CEO and BOD tend to be of the same gender, the likelihood of launching forceful actions decreases. Model 5 suggests that as age differences between the CEO and BOD become less pronounced, there is less

likelihood that a firm will deploy significant competitive moves. These results suggest that lower sources of Social Capital between the CEO and the BOD, as captured in high demographic differences between the two, results in stronger and more forceful, not weak, competitive moves. Thus, Hypothesis 2b-1 is not supported.

Table 5.8

Regression Results. Action Significance as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	Model 3 (Gender Dissim.)	Model 4 (Age Dissim.)
Firm Sales (1998-2000)	-.108 (.000)	-.238 (.000)	-.269 (.000)	-.056 (.000)
Firm Quick Ratio (1998-2000)	-.429 (.024)*	-.449 (.022)**	-.553 (.024)**	-.399 (.023)*
CEO-BOD Social Capital (1998-2000)		.389 (.043)*		
CEO-BOD Gender Dissimilarity (1998-2000)			-.351 (.455)*	
CEO-BOD Age Dissimilarity (1998-2000)				.261 (.008)+
Adjusted R-Square	.111	.233	.191	.156
R-Square Change		.122	.080	.045
F	3.307*	4.740**	3.914**	3.287*
N	38	38	38	38

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below 2.0.

5.1.8 Hypothesis 2b-2

The greater the Social Capital between the CEO and the BOD, the greater the Repertoire Complexity of the firm.

I predicted in this hypothesis that as sources of Social Capital between the CEO and the BOD increased, the Repertoire Complexity of the firm would also increase. To test this hypothesis, I used relational demography variables to capture possible sources for executive Social Capital between the CEO and the BOD. Tested in this way, a firm's Repertoire Complexity would increase when the CEO and the BOD were more similar on pivotal demographic traits.

Table 5.9 presents the results when Repertoire Complexity is regressed onto the CEO-BOD Social Capital variable. The results did not change when size was omitted as a control. I analyzed the separate relational demography variables (functional area, gender, age, and tenure) with the individual dimensions of Repertoire Complexity (competitive range, dominance, and concentration). Some significant relationships did surface with additional hypothesis testing. CEO-BOD Social Capital was related to Competitive Dominance (beta = .312, $p < .01$): CEOs and directors that shared more demographic traits in common tended not to launch a dominant type of action. Overall, analysis failed to conclusively support Hypothesis 2b-2. In general, it appears that sources for Social Capital between the CEO and the BOD do not meaningfully impact a firm's Repertoire Complexity.

Table 5.9

Regression Results. Repertoire Complexity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
Firm Sales (1998-2000)	-.564 (.000)***	-.621 (.000)	1.312
Firm Quick Ratio (1998-2000)	.341 (.084)**	.332 (.082)**	1.191
CEO-BOD Social Capital (1998-2000)		.172 (.160)	1.112
Adjusted R-Square	.475	.564	
R-Square Change		.089	
F	24.884***	18.003***	
N	38	38	

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below 2.0.

5.1.9 Hypothesis 3

When the executive Human Capital of the firm interacts with a firm's executive Organizational Social Capital, a firm will demonstrate more Competitive Intensity.

This hypothesis posed that when high levels of TMT Human Capital interact with greater sources of CEO-BOD Social Capital, a firm's Competitive Intensity would be positively impacted. Table 5.10 displays the results. After computing an interactive term consisting of a firm's TMT Human Capital and sources of Social Capital between the CEO and the BOD, I regressed a firm's Competitive Intensity onto the main predictor variables and the new interactive term. Model 1 is the base model with the typical controls and the main effects of TMT Human Capital and sources of CEO-BOD Social Capital included. Size has a large, significant, and positive effect. Firm slack has a moderate, negative, and significant effect. The weak and non-significant beta coefficients of the main effect variables of Human Capital and Social Capital indicate a minimal contribution to the model. To conserve degrees of freedom with the small sample, I ran a third regression model. Model 3 shows the results when the controls of slack and size are removed. In this model, neither the main effects or

interaction term are significant. In addition, the inclusion of these three variables explains 2.2% of the variance in Competitive Intensity. Notice that the F-ratio is not significant, suggesting a poorly fitting regression model. In summary, there is little empirical support for Hypothesis 3.

Table 5.10

Regression Results. Competitive Intensity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	Model 3 (without controls)
Firm Sales (1998-2000)	.647 (.000)***	.668 (.000)***	
Firm Quick Ratio (1998-2000)	-.326 (.101)**	-.282 (.104)*	
TMT Human Capital (1998-2000)	.064 (.315)	-.027 (.363)	.072 (.472)
CEO-BOD Social Capital (1998-2000)	-.064 (.202)	-.027 (.205)	.136 (.313)
Interactive term (TMT Human Capital X CEO-BOD Social Capital)		-.164 (.164)	-.254 (.215)
Adjusted R-Square	.656	.666	.022
R-Square Change		.010	
F	18.601***	15.769***	1.306
N	38	38	42

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below 2.0.

5.1.10 Hypothesis 4a-1 & 4a-2

Higher levels of bonus pay will strengthen the relationship between Human Capital and Competitive Activity.

Higher levels of bonus pay will strengthen the relationship between Human Capital and Repertoire Complexity.

This set of hypotheses stressed that bonus pay would interact with a firm’s Human Capital to impact a firm’s Competitive Activity and Variety. To test these hypotheses, I computed an interactive term consisting of a firm’s TMT Human Capital and TMT bonus pay. Next, I regressed a firm’s Competitive Activity and Repertoire Complexity onto the predictor variables and the new interactive

term. Tables 5.11 show the results of the analysis with Competitive Activity as the dependent variable. Model 1 is the base model with only the main effects of Human Capital and bonus pay included. Here, the effect of TMT bonus is strong, significant, and positive. Model 2 presents the results when the interactive term is included. In this scenario, the beta coefficient for the interactive term is weak and non-significant, suggesting a negligible impact. Thus, there is little support for Hypothesis 4a-1, stating that that TMT Human Capital would interact with TMT bonus pay to drive a firm's Competitive Activity.

Table 5.11

Regression Results. Competitive Activity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2
TMT Human Capital (1998-2000)	-.048 (2.523)	-.092 (3.354)
TMT Bonus Pay (1998-2000)	.842 (.010)***	.824 (.011)***
Interactive term (TMT Human Capital X TMT Bonus Pay)		.072 (.009)
Adjusted R-Square	.668	.662
F	41.243***	27.064***
N	41	41

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below 2.0.

While these results do not support an interaction affect on Competitive Activity, it does illuminate the importance of bonus pay as a predictor of Competitive Activity. To capture a more accurate vantage in which to gauge the impact of TMT bonus pay, I conducted hierarchical regression, where TMT bonus was entered into a separate block of the regression equation. A large beta coefficient, a high threshold of statistical significance ($p < .001$), and a large R-square value of over .660 all indicate that TMT bonus is a rather strong predictor of Competitive Activity.

Table 5.12 show the results of two models used to test the hypothesis regarding the interactive effect of TMT Human Capital and TMT Bonus on a firm's Repertoire Complexity. Model 1 is the

base model and presents the results of only the main effects of TMT Human Capital and TMT bonus pay. The results in this model suggest that as the bonuses of the TMT increase, there is a corresponding increase in the Repertoire Complexity of a firm. The standardized beta coefficient for TMT bonus pay is strong and significant. In addition, TMT bonus pay and TMT Human Capital explain close to half of the variance of a firm's Repertoire Complexity. In separate analysis (not reported here), TMT bonus pay emerged as a powerful predictor of each dimension of Competitive Complexity. Notably, as TMT bonus pay increased, firms tended to employ a more diverse array of competitive moves evidenced by low concentration and dominance scores and a high range score. Model 2 in Table 5.12 illustrates the impact to a firm's Repertoire Complexity when the interactive term is included. The non-significant beta coefficient does not support an interaction and, therefore, does not provide support for Hypothesis 4a-2.

Table 5.12

Regression Results. Repertoire Complexity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2
TMT Human Capital (1998-2000)	.126 (.240)	.065 (.319)
TMT Bonus Pay (1998-2000)	-.755 (.001)***	-.780 (.001)***
Interactive term (TMT Human Capital X TMT Bonus Pay)		.099 (.001)
Adjusted R-Square	.498	.489
F	20.814***	13.754***
N	41	41

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients. All VIF factors were below 2.5.

In summary, analysis failed to support Hypotheses 4a-1 and 4a-2 in which joint effects were put forth. What is noteworthy, however, is the magnitude of TMT bonus pay in explaining both major dependent variables: Competitive Activity and Repertoire Complexity.

5.1.11 Hypothesis 4b-1 & 4b-2

Higher levels of incentive pay will strengthen the relationship between Human Capital and Action Significance.

Higher levels of incentive pay will strengthen the relationship between Human Capital and Repertoire Complexity.

Table 5.13 presents the results for Hypothesis 4b-1, which states that incentive pay would strengthen the relationship between an executive's Human Capital and the Action Significance of the firm. Given the poor explanatory power of the educational variables, I regressed Action Significance onto a CEO's firm tenure, onto a CEO's incentive pay, and an interactive term that I computed comprising CEO tenure and CEO incentive pay. Model 1 shows the results when only the main effects are included. In Model 1, CEO incentive pay is positive and significant, which suggests that as the

incentives to the CEO increase, a firm’s Action Significance is likely to increase as well. Model 2 in Table 5.13 includes the interactive term and illustrates the impact to a firm’s Repertoire Complexity. The beta coefficient of the interactive term was narrowly outside accepted significance thresholds. Notice in Model 2 that including the interactive term slightly improved the fit and explanatory power of the model evidenced by a higher F-ratio and an increase in the R-square term of about 4%. The VIF diagnostic tests that exceeded 10.0 for each variable indicate the presence of multicollinearity. Hence, Hypothesis 4b-1 is not supported.

Table 5.13

Regression Results. Action Significance as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
CEO Firm Tenure (1998-2000)	-.248 (.272)	-1.206 (1.091)+	16.950
CEO Incentive Pay (1998-2000)	.266 (.382)+	-.623 (1.427)	14.728
Interactive term (CEO Firm Tenure X CEO Incentive Pay)		1.396 (1.407)	33.798
Adjusted R-Square	.069	.105	
F	2.414	2.491+	
N	39	39	

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients.

Table 5.14 presents the results for Hypothesis 4b-2, which states that CEO incentive pay would strengthen the relationship between a CEO’s Human Capital and the Repertoire Complexity of the firm. Model 1 illustrates the impact of the main effects of CEO tenure and incentives. The beta coefficient for CEO incentives is strong and significant, which suggests that as CEO incentives increase, there is a corresponding increase in the complexity of moves that a firm employs. In Model 1, the main effects account for 38% of the variance in Repertoire Complexity. In Model 2, the results reflect the impact of the interactive term that I computed comprising CEO tenure and CEO incentive pay. Here the beta coefficient of the interactive term is significant. In addition, including this variable

explained an additional 4.6% variance in Repertoire Complexity. Thus, there is support for an interaction.

Table 5.14

Regression Results. Repertoire Complexity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
CEO Firm Tenure (1998-2000)	.061 (1.072)	1.023 (4.223)*	16.950
CEO Incentive Pay (1998-2000)	-.648 (1.505)***	.244 (5.527)	14.728
Interactive term (CEO Firm Tenure X CEO Incentive Pay)		-1.401 (5.446)+	33.798
Adjusted R-Square	.383	.429	
R-Square Change		.046	
F	12.810***	10.508***	
N	39	39	

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients.

To better understand this interactive effect, I constructed a table of main effects and marginal means. This is presented in Table 5.15. The cell means were computed by inputting 1.00 and -1.00 into the regression equation signifying high and low values as 1 standard deviation above and below the mean.

Table 5.15

Tabular Display of Main Effects and Marginal Means with Repertoire Complexity as the Dependent Variable

	LOW CEO INCENTIVE	HIGH CEO INCENTIVE	MARGINAL MEANS
LOW CEO TENURE	-5.6	-2.4	-4.0
HIGH CEO TENURE	-0.8	-3.1	-2.0
MARGINAL MEANS	-3.2	-2.8	

These results suggest a small main effect for CEO tenure and CEO tenure by incentive interaction. Lower tenured CEOs are associated with more complex repertoires. A firm's Repertoire Complexity appears to be particularly impacted when high tenured CEOs also possess lower incentive packages. In this scenario, Repertoire Complexity is at its lowest. These results provide moderate support for Hypothesis 4b-2.

5.1.12 Hypothesis 5a-1 & 5a-2

Higher levels of bonus pay will strengthen the relationship between Social Capital and Repertoire Complexity.

Higher levels of bonus pay will strengthen the relationship between Social Capital and Competitive Activity.

Table 5.16 presents the results for Hypothesis 5a-1, which states that incentive pay would strengthen the relationship between CEO-TMT Social Capital and a firm’s Repertoire Complexity. To test this hypothesis, I computed an interactive term consisting of a firm’s sources of CEO-TMT Social Capital and TMT bonus pay. Model 1 displays the result when only the main effects are accounted for. The effect for TMT bonus is strong and significant in Model 1 suggesting that higher TMT bonuses result in more complex repertoires. Model 2 in Table 5.16 includes the interactive term and reflects the impact of this interactive term on a firm’s Repertoire Complexity. The beta coefficient of this interactive term is small and non-significant. In addition, adding this interactive term does not improve the explanatory power of the model. Hence, there is no support for Hypothesis 5a-1.

Table 5.16

Regression Results. Repertoire Complexity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
TMT Social Capital (1998-2000)	-.147 (.194)	-.087 (.269)	2.463
TMT Bonus Pay (1998-2000)	-.633 (.001)***	-.604 (.001)***	1.586
Interactive term (CEO-TMT Social Capital X TMT Bonus Pay)		-.096 (.001)	2.975
Adjusted R-Square	.486	.475	
F	19.441***	12.768***	
N	40	40	

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients.

Table 5.17 presents the results for Hypothesis 5a-2, which states that sources of CEO-TMT Social Capital would interact with TMT bonus pay to drive a firm’s Competitive Activity. Model 1 displays the main effects. Both the Social Capital and bonus pay variables are statistically significant. The large beta coefficient for TMT bonus pay indicates a strong relationship between TMT bonus and Competitive Activity. These two variables in Model 1 explain almost 70% of the variance in firm Competitive Activity. In Model 2, the results reflect the impact of the interactive term that I

computed consisting of sources of CEO-TMT Social Capital and TMT bonus pay. In this model, the beta coefficient of the interactive term is significant providing evidence of an interaction.

Furthermore, the inclusion of this interactive term increases the explanatory power of the model by more than 5%. Thus, an interaction is supported.

Table 5.17

Regression Results. Competitive Activity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
TMT Social Capital (1998-2000)	.188 (1.779)+	-.050 (2.129)	2.463
TMT Bonus Pay (1998-2000)	.749 (.010)***	.600 (.010)***	1.586
Interactive term (CEO-TMT Social Capital X TMT Bonus Pay)		.412 (.005)**	2.975
Adjusted R-Square	.699	.756	
R-Square Change		.057	
F	47.361***	42.383***	
N	41	41	

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients.

Interpreting interactions can be difficult and once an interaction is detected, main effects must be reexamined (Whitley, 2002). To better understand this interactive effect, I constructed a table of main effects and marginal means. This is presented in Table 5.18. The cell means were computed by inputting 1.00 and -1.00 into the regression equation signifying high and low values as 1 standard deviation above and below the mean.

Table 5.18

Tabular Display of Main Effects and Marginal Means with Competitive Activity as the Dependent Variable

	LOW TMT BONUS	HIGH TMT BONUS	MARGINAL MEANS
LOW SOCIAL CAPITAL	2.2	3.4	2.4
HIGH SOCIAL CAPITAL	1.4	2.6	2.4
MARGINAL MEANS	1.8	3.0	

Taken together, these results support a strong main effect for TMT bonus. Also, there appears to be a small interaction effect between sources of Social Capital and TMT bonus. When CEO-TMT Social Capital is low, the impact of TMT Bonus is more pronounced. For these reasons, there is some support for Hypothesis 5a-2, but the interaction appears stronger when the CEO and TMT are more demographically dissimilar.

5.1.13 Hypothesis 5b-1 & 5b-2

Higher levels of incentive pay will strengthen the relationship between Social Capital and Repertoire Complexity.

Higher levels of incentive pay will strengthen the relationship between Social Capital and Action Significance.

Table 5.19 displays the results for Hypothesis 5b-1, which state that incentive pay of the TMT would interact with CEO-TMT Social Capital to increase the complexity of a firm’s competitive repertoire. To test this hypothesis, I computed an interactive term consisting of a firm’s sources of CEO-TMT Social Capital and TMT incentive pay. Model 1 displays the result when only the main effects are included. In the first model, both coefficients for Social Capital and incentive pay are significant. Incentive pay appears to be a particularly strong predictor variable in this model evidenced by a large beta coefficient. Together, these two variables account for 57% of the variance in the dependent variable of Repertoire Complexity. Model 2 presents the results then the interactive term is included. Notably, the beta coefficient of the interactive term is significant ($p < .001$) and improves the predictive power of the model by almost 10%. Hence, an interaction is supported. To illuminate the nature of this interaction, I constructed a table of main effects and marginal means. This is presented in Table 5.20. The cell means were computed by inputting 1.00 and -1.00 into the regression equation signifying high and low values as 1 standard deviation above and below the mean.

Table 5.19

Regression Results. Repertoire Complexity as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
TMT Social Capital (1998-2000)	-.288 (.160)*	1.001 (.569)*	17.559
TMT Incentive Pay Mix (1998-2000)	-.645 (1.598)***	-.673 (1.409)***	1.079
Interactive term (TMT Social Capital X TMT Incentive Pay)		-1.321 (.780)***	17.314
Adjusted R-Square	.574	.671	
R- Square change		.097	
F	27.255***	27.542***	
N	40	40	

+ $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$; All coefficients reported are standardized coefficients.

Table 5.20

Tabular Display of Main Effects and Marginal Means with Repertoire Complexity as the Dependent Variable

	LOW TMT INCENTIVE	HIGH TMT INCENTIVE	MARGINAL MEANS
LOW TMT SOCIAL CAPITAL	10.0	6.0	8
HIGH TMT SOCIAL CAPITAL	5.4	6.6	6
MARGINAL MEANS	7.7	6.3	

Based on this information, there appears to be a modest main effect for TMT incentive pay, a main effect for sources of Social Capital, and a Social Capital by TMT incentive interaction. As TMT incentives increase a firm's repertoire becomes more complex. Also, as sources for Social Capital increase there is a corresponding increase in the complexity of a firm's competitive repertoire. This signals a departure from previous findings that examined only main effect relationships between sources of Social Capital and Repertoire Complexity and associated complexity dimensions. From the above table it appears that a firm's repertoire is least complex when there are low sources for Social Capital and low TMT incentives. At lower levels of executive Social Capital, high TMT incentives can appear to counter these effects and drive complex competitive repertoires, despite fewer sources of Social Capital. Thus, the main effects and the interaction lend empirical evidence in support of Hypothesis 5b-1.

Table 5.21 presents the results for Hypothesis 5b-2, which states that incentive pay of the TMT would interact with sources of CEO-TMT Social Capital to increase a firm's Action Significance. Model 1 highlights the results when only the main effects are included. In this first model, the beta coefficient for TMT incentive pay is significant and positive, suggesting that higher TMT incentives correspond to actions of greater force and magnitude. The standardized beta coefficient for TMT Social Capital is not significant. Together, these variables explain just over 10% of the variance in a firm's Action Significance. Model 2 presents the results when the interactive term is added to the regression model. Here the coefficient for the interactive term is not significant. Also, the modest increase in the R-square value of 1.5% suggests a low effect size. Given the lack of statistical significance coupled with the low effect size, Hypothesis 5b-2 is not supported.

Table 5.21

Regression Results. Action Significance as Dependent Variable in Years 1999-2001

Independent Variables	Model 1 (base)	Model 2	VIF
TMT Social Capital (1998-2000)	-.173 (.050)	.605 (.200)	17.559
TMT Incentive Pay Mix (1998-2000)	.397 (.497)*	.380 (.495)*	1.079
Interactive term (TMT Social Capital X TMT Incentive Pay)		-.798 (.274)	17.314
Adjusted R-Square	.106	.121	
F	3.313*	27.542+	
N	40	40	

+ p < .1, * p < .05, ** p < .01, *** p < .001; All coefficients reported are standardized coefficients.

5.1.14 Hypothesis 6

Higher levels of Competitive Activity will result in higher firm performance.

This hypothesis predicted that Competitive Activity would influence the performance measures of net income and return on assets. In simple bivariate regression, firm Competitive Activity appears to influence the overall profitability of the firm. Competitive Activity explained 79% of the variance

in net income (beta = .891; $p < .001$) and 18% of a firm's Return on Assets (beta = .439; $p < .01$). I entered the control variable of firm size to further discern the performance implications of Competitive Activity. Because sales are so closely related to Net Income, I used an alternate measure of firm size, total employees (in thousands) as a control. In this case, firm size explained 70% of the variance in Net Income, but was not statistically significant. The addition of firm Competitive Activity explained an additional 10% variance of firm Net Income (beta = .676; $p < .001$). Neither firm size nor firm Competitive Activity were statistically significant predictors of a firm's Return on Assets. The R-square change associated with including firm Competitive Activity was 1.5%. I continued by regressing an alternative performance measure, change in sales, onto a firm's Competitive Activity. This beta coefficient was not significant nor was there an increase in explanatory power of the simple regression model. In fact, Competitive Activity explained less than 1% variance of a firm's change in sales.

It is important to note that the relationship between firm Competitive Activity and firm performance appears higher in this study when compared against the several studies that were reviewed in Chapter 2. In those studies, correlations between firm Competitive Activity and firm performance were rarely above .20. The simple weighted average of the zero order correlations for those studies was .18. The high correlations in this study between firm Competitive Activity and Net Income (.891) and Return on Assets (.439) suggest a slightly stronger effect size in this study when benchmarked against previous competitive behavior research that report relationships with firm performance.

For these reasons, I find modest support for Hypothesis 6.

5.1.15 Hypothesis 6a

Higher levels of Repertoire Complexity will result in higher firm performance.

This hypothesis predicted that a firm's Repertoire Complexity would influence firm profitability variables. Like firm Competitive Activity, a firm's Repertoire Complexity seemed to have its largest impact on the Net Income measure. Without control variables, a firm's Repertoire Complexity explained 40% of the variance in Net Income (beta = -.642; $p < .001$). This impact was largely negated, however, when the control of size was entered into the regression equation. Although in the predicted direction, a firm's Repertoire Complexity was not a statistically significant or potent predictor of a firm's Return on Assets ($r = -.174$; less than 1% change in R-squared) without the inclusion of any controls. In addition, Repertoire Complexity did not appear to have a statistically significant impact on other alternative performance measures, such as change in sales.

Benchmarked against previous studies identified in Chapter 2 of this dissertation that examined complexity measures of competitive behavior with firm performance, the results, here, appear more robust. The highest correlation between previously studied complexity variables and firm performance is work conducted by Miller and Chen (1994) who found a .33 correlation between Competitive Inertia and revenue per available seat mile flown (RPSM). Also, the simple weighted average of the zero order correlations for all studies that examine variants of competitive complexity and organizational performance was under .10. In this analysis, Repertoire Complexity was more strongly correlated to firm performance (-.642 with Net Income; -.174 with Return on Assets). In general, these results suggest a slightly stronger firm complexity behavior to firm performance relationship than previously conducted studies that examine similar links to firm performance. For these reasons and largely consistent with previous research, I find weak support for the inference that a firm's Repertoire Complexity influences a firm's overall performance.

5.1.16 Hypothesis 6b

Higher levels of Action Significance will result in higher firm performance.

This hypothesis predicted that a firm's Action Significance would positively influence several performance measures. This hypothesis was not supported. In simple bivariate linear regression, correlations for Action Significance were not statistically significant nor impacted the simple regression model for any of the firm performance measures: Net Income ($r = .003$), Return on Assets ($r = .088$), and Change in Sales ($r = -.090$).

5.1.17 Hypothesis 6c

Higher levels of Competitive Intensity will result in higher firm performance.

Hypothesis 6c suggested that a firm's overall Competitive Intensity would positively influence a firm's financial performance. Simple bivariate regression analysis supports this hypothesis. The beta coefficient for Competitive Intensity is positive and significant when predicting Return on Assets (beta = .274; $p < .10$) and Net Income (beta = .741; $p < .001$). In terms of effect size, firm Competitive Intensity explains 5% of the variance in a firm's Return on Assets and over 53% of a firm's Net Income. Firm Competitive Intensity did not appear to predict a firm's change in sales evidenced by low effect sizes and failure to meet conventional levels of statistical significance. Based on these results, I find moderate support for Hypothesis 6c.

5.2 RESULTS SUMMARY

Table 5.22 summarizes the results of the analyses for each hypothesis

Table 5.22

Results Summary.

Hypothesis	Status	Key Findings
1a-1	Modest Support	<ul style="list-style-type: none"> • TMT Human Capital was positively related to firm Competitive Activity when firm size not included as a control. • Firm Specific Human Capital, as measured by TMT firm tenure, was a significant and strong predictor of Competitive Activity when size was omitted as a control <ul style="list-style-type: none"> ○ TMT firm tenure explained an additional 15% of variance in firm Competitive Activity
1a-2	Modest Support	<ul style="list-style-type: none"> • TMT Human Capital is a positive and significant predictor of Repertoire Complexity when size is omitted as a control. • Firm Specific Human Capital, as measured by TMT firm tenure, was positively related to a firm's Repertoire Complexity when size was omitted as a control. <ul style="list-style-type: none"> ○ Firm tenure positive and strong impact on the Complexity dimension of Range
1b-1	Not Supported	<ul style="list-style-type: none"> • Only firm slack was a significant predictor of Action Significance.
1b-2	Not Supported	<ul style="list-style-type: none"> • BOD Human Capital was not a significant predictor of Repertoire Complexity. <ul style="list-style-type: none"> ○ BOD Human Capital a significant predictor of separate dimensions of Repertoire Complexity, such as Competitive Concentration
2a-1	Not Supported	<ul style="list-style-type: none"> • Low sources of CEO-TMT Social Capital, as reflected in greater demographic dissimilarity, resulted in greater Repertoire Complexity when size was omitted as a control. <ul style="list-style-type: none"> ○ Greater demographic dissimilarity between CEO and TMT resulted in less Competitive Concentration and more Competitive Range • High functional demographic dissimilarity, an indicator of a poor source of CEO-TMT Social Capital, resulted in higher Repertoire Complexity. This relationship held when size was included as a control. • High tenure dissimilarity also corresponded to higher levels of Repertoire Complexity when size was omitted as a control. • Changes in R-square values were quite high—the higher the demographic differences, the greater the Repertoire Complexity.
2a-2	Not Supported	<ul style="list-style-type: none"> • Low sources of CEO-TMT Social Capital, as reflected in greater demographic dissimilarity, resulted in greater Competitive Activity when size was omitted as a control. <ul style="list-style-type: none"> ○ Large changes in R-square values suggesting strong effect size • High tenure dissimilarity, an indicator of poor sources of Social Capital, was associated with higher Comp Activity.

Table 5.22 continued

Hypothesis #	Status	Key Findings
2b-1	Not Supported	<ul style="list-style-type: none"> • With both controls of size and slack entered, low sources of CEO-BOD Social Capital, as reflected in greater demographic dissimilarity, were significant predictors of Action Significance. <ul style="list-style-type: none"> ○ Adding demographic variables to the model explained 12% of the variance in a firm’s Action Significance above and beyond firm size and slack • The more gender diverse the BOD compared to the CEO, the greater the Action Significance. • The greater the age differences between the CEO and the BOD, the more likely the firm is to launch significant actions.
2b-2	Mixed Support	<ul style="list-style-type: none"> • High sources of CEO-BOD Social Capital, as reflected in greater demographic similarity, resulted in less Competitive Dominance—a key dimension of Repertoire Complexity with both size and slack entered as controls. • Gender and functional dissimilarity emerged as significant predictors of Competitive Range. These variables were in the direction opposite of that predicted. <ul style="list-style-type: none"> ○ A higher proportion of directors who shared the same gender and functional background of the CEO corresponded to a more restricted Competitive Range of competitive behavior ○ Findings are suspect due to the large standard errors
3	Not Supported	<ul style="list-style-type: none"> • Only firm size and slack were significant predictors of a firm’s Competitive Intensity.
4a-1/4a-2	Not Supported	<ul style="list-style-type: none"> • TMT bonus pay demonstrated a strong and significant main effect for both Competitive Activity and Repertoire Complexity <ul style="list-style-type: none"> ○ The higher the bonus, the more active and complex a firm’s repertoire ○ Each dimension of Repertoire Complexity (i.e., Concentration, Range, and Dominance) were influenced by TMT bonus pay
4b-1	Not Supported	
4b-2	Supported	<ul style="list-style-type: none"> • Interaction supported. CEO incentive pay interacts with CEO tenure to influence a firm’s Repertoire Complexity. <ul style="list-style-type: none"> ○ High tenured, lowly incentivized CEO’s appear to drive more simplistic, not complex, competitive behaviors

Table 5.22 continued

Hypothesis #	Status	Key Findings
5a-1	Not Supported	
5a-2	Supported	<ul style="list-style-type: none"> • An interaction effect between TMT bonus pay and CEO-TMT Social Capital on firm Competitive Activity was supported. <ul style="list-style-type: none"> ○ Lower sources of CEO-TMT Social Capital, as reflected in greater demographic dissimilarity, interacted with high bonus pay to drive firm Competitive Activity ○ Results support a strong main effect of TMT bonus pay on firm Competitive Activity
5b-1	Supported	<ul style="list-style-type: none"> • Main effects for TMT incentive pay, sources of CEO-TMT Social Capital, and the interaction of the main effects were supported. <ul style="list-style-type: none"> ○ Firm's repertoire is least complex when there are low sources for Social Capital and low TMT incentives ○ Interactive term enhances the predictive power of the model by almost 10% ○ Each dimension of Repertoire Complexity (i.e., Concentration, Range, and Dominance) were influenced by TMT bonus pay
5b-2	Not Supported	<ul style="list-style-type: none"> • TMT incentives was a significant and positive predictor of Action Significance.
6	Modest Support	<ul style="list-style-type: none"> • Competitive Activity was positively related to performance indices of Net Income and Return on Assets. <ul style="list-style-type: none"> ○ Not significant when firm size was included as a control
6a	Modest Support	<ul style="list-style-type: none"> • Repertoire Complexity was significantly related to a firm's Net Income. <ul style="list-style-type: none"> ○ Repertoire Complexity explained 40% of the variance in Net Income ○ Not significant when firm size was included as a control
6b	Not Supported	
6c	Modest Support	<ul style="list-style-type: none"> • Competitive Intensity was positively correlated with both Return on Assets and Net Income. <ul style="list-style-type: none"> ○ Competitive Intensity accounted for 53% of the variance in Net Income

6.0 DISCUSSION

I have argued that Upper-Echelon management provides a firm awareness, motivation, and capability to vigorously compete. In addition, I put forth that a firm's executive compensation policy, particularly, incentive-laden systems, motivate these strategic human assets to competitively engage. This dissertation does provide some evidence that the strategic management group of an organization can impact firm competitive behavior.

Empirical evidence offers some support regarding the importance of executive Human Capital as a driver of competitive moves. While organizational size was the most capable predictor of volume of competitive moves, other factors, such as TMT Human Capital, and, in particular firm tenure, could also drive competitive behavior. Human Capital, especially that of the TMT, seemed to influence a firm's Repertoire Complexity and its respective competitive dimensions. Interestingly, organizational slack was as potent a predictor of many dimensions of complexity as firm size or executive Human Capital. Unlike previous studies, however, (Ferrier, 2001), the consequence of possessing too much slack was lower activity and, in particular, lower Repertoire Complexity and Action Significance. Having too much slack seems to detract from a firm's overall competitive repertoire.

Educational pedigree, a reflective indicator of general Human Capital, could not explain any of the competitive dimensions with great certainty or clarity. It may be that holding a prestigious degree is helpful to gain entry into an organization or even provide an initial boost into certain managerial positions. However, earning senior management positions could be a function of experience and success in previous jobs within and outside the firm. Said differently,

stakeholders may place more emphasis on prior work experience rather than educational pedigree in filling the top posts of an organization.

A theme that appeared to receive support from the data was the importance of senior management diversity—not similarity, or as I describe, sources of Social Capital. For instance, results suggest that as the CEO and TMT become more dissimilar on key demographic traits, especially in such areas as functional diversity or tenure, firm competitive moves become more complex and sophisticated. It may be that heterogeneity leads to organization innovation as some propose (Bantel & Jackson, 1989) driven by breadth of experiences and diverse cognitive frameworks. But even in competitive scenarios that emphasize organizational efficiency, as opposed to creativity, such as vigorous Competitive Activity, dissimilarity between the CEO and other high level managers had an impact. Of particular note, findings indicate that dissimilarity between the BOD and the CEO is associated with more significant competitive moves. This is surprising given some of the command and control difficulties and social acrimony that can arise in diverse groups (Ancona & Caldwell, 1992; Wagner, Pfeffer, & O'Reilly, 1984). One plausible explanation is that senior executives rely less on demographic characteristics to generate Social Capital. Many of them are well trained with polished interpersonal skills that they can easily leverage to form or generate Social Capital. An interesting possibility is that lower level managers and workers may rely more on relational demography characteristics, and, in particular, demographic similarity to build Social Capital via the similarity attraction paradigm (Byrne, 1971) and improved communication perspective (Zenger & Lawrence, 1989). Executives may not need demographic similarity to form Social Capital, but may leverage demographic *dissimilarity* to deal with diverse and changing environments (Wiersema & Bantel, 1992). It is important to note, however, that demographic dissimilarity works differently

between the CEO and the TMT and the CEO and the BOD. For instance, an increase in sources for CEO-BOD Social Capital results in greater Repertoire Complexity. Conversely, increases in sources for CEO-TMT Social Capital result in lower Repertoire Complexity. This may be due, in part, to the infrequent and sporadic working nature shared between the CEO and the BOD.

It is important to acknowledge firm size as a strong predictor of both Competitive Activity and Repertoire Complexity. Omitting this variable from several rounds of my analysis should not dismiss the importance of this variable. Moreover, the findings in support of some of this study's hypotheses need to be couched in the understanding that the pivotal control variable of size was removed. With few exceptions (Chen & Hambrick, 1995), little empirical or theoretical research has attempted to understand the phenomenon of exactly how size impacts a firm's competitive behavior. It appears that several studies, including this one, have addressed the "if and to what extent" question regarding firm size and firm competitive behavior. Future research may wish to tease out the "why" and "how" questions surrounding the impact of firm size on competitive behavior.

Other important takeaways include the importance of compensation systems both as main drivers and, also, as possible levers that interact with a firm's Human and Social Capital to influence firm competitive behavior. In separate analysis not reported here, TMT bonus pay was the equal of or better than organizational size as a predictor of Competitive Activity. Bonus and incentive systems also positively impact a firm's Repertoire Complexity. Empirical testing suggests that bonuses and incentives interact with executive Human Capital and sources of Social Capital to influence firm competitive behavior. These findings may link well with other demographic research that implies that demographic characteristics are static and will remain

static unless a process or mechanism exposes the diversity associated with demographic characteristics (Smith *et al.*, 1994).

Finally, analysis indicates that the competitive dimensions of Activity, Complexity, and the overall construct of Competitive Intensity impact a firm's financial performance, especially in regard to Net Income.

6.1 LIMITATIONS

There are several limitations to this study that must be acknowledged. First, there are several issues relating to data collection. The relational demography measures are a well-intended, but distal, attempt to capture executive Social Capital or "sources" of Social Capital. I acknowledge that Social Capital may, indeed, be one of the most rich and robust constructs in organizational research. One should approach the construct validity of Social Capital as it is measured in this dissertation aware of limitations to demography research. Second, the integrity of the data, particularly the independent variables, is open to question. Retrieving information on executives who served four to six years ago with a firm that is no longer in business either through merger or bankruptcy was problematic. Accordingly, data collection did not come from a single source. Rather, data was extracted from a variety of different outlets, some of which maintained the highest standards of legitimacy (e.g., SEC reports). Efforts were made to demonstrate convergent validity of data when feasible (e.g., same executive information from different sources). This multi-source approach is problematic because it adds variability to the data. Third, I employ a single industry sample. Competitive norms vary among industries (Smith *et al.*, 2001). By keeping industry context constant, I sacrifice external validity to achieve appropriate thresholds of internal validity. The sample also represents only large U.S.

pharmaceutical firms. Admittedly, these firms dominate the industry, but my sample fails to include smaller, more entrepreneurial firms, that are known to compete differently (Chen & Hambrick, 1995). In addition, I fail to capture subsidiaries of these major pharmaceutical firms. Fourth, the small sample leads to statistical and methodological challenges that are difficult to ignore or overcome. For instance, high standard errors often accompany analysis conducted on small samples. Indeed, in some analysis standard errors exceeded 50.000. This indicates a significant variability around the beta coefficients. The beta coefficients are not anchored and the confidence that one places in those coefficients should be tempered. Thus, the stability of the regression model is an open question. Also, more advanced statistical approaches, such as Exploratory/Confirmatory Factor models are also difficult to execute with samples less than 200 (Pedhazur & Schmelkin, 1991). Also, the small sample restricted degrees of freedom, and as a result, limited the number of control or endogenous variables that could be entered into the regression equation. Consequently, the regression model is not fully specified. Fifth, I suggest in my theory development the possibility of reverse causality. Specifically, firm competitive behavior could actually impact or influence the independent and moderating variables. Indeed, there is some evidence that Competitive Activity and some dimensions of Repertoire Complexity influence the amount that CEOs are paid (Offstein & Gnyawali, 2004). Since the non-recursive or reverse causality possibility is not tested in this dissertation, it must be acknowledged as a limitation. Finally, the actions as we captured them are news reports. Although great effort was used to detect and differentiate between an action and signal, we cannot say with full confidence that the reported action actually occurred. In a similar vein, report bias embedded in the news articles likely existed but was negated since the coders used multiple and diverse outlets to capture the competitive moves.

6.2 CONTRIBUTIONS TO RESEARCH

This dissertation makes several contributions to both theoretical and empirical research. To begin with, the model and arguments that I develop in Chapter 3 should advance theory in the competitive behavior research stream. To this point, scholars have emphasized factors outside the boundaries of the firm as drivers of competitive activity. Chen (1996) highlights that market commonality and resource similarities with a rival firm affect the awareness, motivation, and capability of firms to launch competitive moves. Others, such as Gnyawali and Madhavan (2001), stress the position of a firm within a network to accumulate resources necessary for competitive behavior. The Upper-Echelon perspective that I put forth differs in that it calls attention to the resources that exist within the boundaries of the firm. Not surprisingly, this theoretical vantage challenges some of the core assumptions that underpin much of competitive dynamics work---that competitive behavior is solely driven by firms reacting to rival firms within the market (Smith *et al.*, 1991; Smith *et al.*, 2001). My theory suggests that firms may not always be provoked by a rival to act. Rather, the human capital within a firm can exercise their own discretion and agenda when deciding to launch competitive moves, irrespective of competitive attacks from rival firms.

While the empirical testing of the Competitive Intensity construct that I develop in Chapter 3 is quite limited and inconclusive to its effect on firm performance, the theoretical importance of this construct should not be overlooked. A solid and comprehensive literature review reveals that firms must visit all three competitive dimensions of force, volume, and complexity to enjoy a competitive advantage. Examining only one dimension of competitive behavior presents a skewed and inconclusive picture in which to gauge the efficacy of a firm's competitive repertoire. Firms that launch a high volume of actions without requisite variety or

force are less likely to earn competitive advantages when compared to a firm that launches a flurry of forceful and complex moves. Thus, the value of the Competitive Intensity construct is that it forces researchers to avoid studying competitive behavior in a piecemeal manner. Rather, this construct better reflects the totality of the competitive experience. Moreover, embracing this more holistic construct allows scholars to better assess the significance of antecedents that drive firm behavior. Both theoretically and practically, researchers should attempt to identify and study those drivers that affect all three dimensions of competitive behavior. At the very least, research is needed to pinpoint which competitive dimension an antecedent impacts the most. Take for example, firm size as a driver of firm competitive behavior. My analysis indicates that firm size is an important driver of Competitive Activity and, to a lesser extent, Repertoire Complexity. Firm size, however, does not appear to influence the Action Significance of a firm. When organizational size is complimented with high TMT incentives, which my analysis links to Action Significance, the key competitive dimensions of volume, variety, and force are addressed. Thus, embracing the Competitive Intensity construct may help competitive behavior researchers define, develop, and implement their research agenda.

Also, this dissertation offers a new setting in which to study competitive behavior. This change of setting is important since much of the most cited competitive behavior articles stem from the study of a single industry--the U.S. Airline Industry (e.g., Chen & Hambrick, 1995). Studying a phenomenon with different samples and across settings is critical in improving the external validity of research findings and conclusions (Pedhazur & Schmelkin, 1991). In this dissertation, for example, the relationship between organizational slack and competitive behavior is contrary to findings in other studies. While previous research suggests that higher slack contributes to a firm's competitive volume (Ferrier, 2001), my results suggest otherwise. Within

the U.S. Pharmaceutical Industry, the amount of organizational slack is inversely related to the amount of actions a firm launches. This contradiction underscores the importance of examining the competitive phenomenon against different industry backdrops.

Next, the methodology that is used to capture actions is both novel and rigorous and may serve as an exemplar to other researchers aiming to capture and record specific observable moves. Building off the work of Gnyawali and colleagues (2002), I sought out direct managerial input, via qualitative semi-structured interviews, to construct the listing and definitions of the competitive actions and the appropriate coding schemes. Furthermore, this dissertation is among the first to use actual high-level managers to assess and rate each action listing along several competitive dimensions, of which only Action Significance is reported here. The computation of an inter-rater agreement score, r_{wg} , also contributed to the content and face validity of the coding approach.

Finally, this dissertation is among the first empirical examinations of the CEO and the BOD as drivers of firm competitive behavior. To date, there is a wide disparity between the media coverage of the CEO and the BOD and actual research that examines their contributions to firm survival and competitiveness. While the TMT receives the most research scrutiny, probably as a result of Hambrick and Mason's (1984) Upper-Echelon perspective, the sole contributions of the CEO and the BOD to a firm's competitive behavior, by and large, have fallen under many research radars. Results from this dissertation offer some empirical support linking the CEO and the BOD to a firm's Action Significance and Repertoire Complexity. Findings such as these help substantiate the importance of other strategic partners of the firm, the CEO and BOD, as drivers of a firm's competitive strategy.

6.3 MANAGERIAL IMPLICATIONS

Corporate managers, directors, and strategic human resource planners could benefit from both the theory and testing put forth in this dissertation. First, the Upper-Echelon perspective is a model of opportunity. Unlike previously studied antecedents of competitive dynamics such as organizational size, slack, or age, the human dimensions here are subject to continual renewal and can be fluidly changed. People can always become more educated, more skilled, and more committed. Likewise, relationships between people can be enhanced via trust and open dialogue. Consequently, the executive focused variables are more prone to influence and manipulation than non-human factors. Second, executives may use offshoots of this model as a diagnostic heuristic to determine where human barriers exist for Competitive Intensity. A CEO may come to realize that her cohort consisting of the top management team and firm directors are very talented but lack the requisite Social Capital or integration needed for Competitive Intensity. Alternatively, a CEO or strategic human resource executive can develop appropriate HR action plans to build on strengths or overcome weaknesses. Changes to recruitment, selection, training, compensation, or performance appraisal systems could be used, either separately or in harmony, as corrective measures in response to these shortcomings. Finally, managers may feel more secure in investing in people related resources. Due to the causal ambiguity and social complexity that surround these forms of capital, rival replication can be minimized (Barney, 1991).

6.4 DIRECTIONS FOR FUTURE RESEARCH

The richness of the Upper-Echelon perspective of competitive behavior becomes more apparent with its future research implications. I outline four of the most promising avenues for future theoretical and empirical inquiry: (1) impact of labor and workforce, (2) role of other HR systems, (3) possibilities relating to understanding competitive response, and (4) potential of integrating non-human and human predictors into an omnibus type model.

First, for parsimony, I only pursue relationships between the human assets at the pinnacle of an organization. While firmly rooted in theoretical (e.g., Hambrick & Mason, 1984) and empirical work (e.g., Wiersema & Bantel, 1992), it is quite likely that characteristics of the labor force impact the competitive posture of a firm. It would seem then that the Human Capital embedded within the firm's workforce could be of particular appeal in examining a firm's Competitive Intensity. Using typical variables and measures of Human Capital, such as education and experience, one could examine how a firm with low turnover and higher education levels of their workers competes compared to rivals with lower marks in these areas. Intriguing possibilities begin to surface when one examines the interaction between the Human Capital of the strategic partners of a firm (CEO, the TMT, and the BOD) and the Human Capital of the workforce. For example, how is the Competitive Intensity of a firm affected when Upper-Echelons possess low Human Capital, but the workforce is highly educated and trained? Can superior Human Capital at the lower levels of an organization, counter or neutralize potential damaging competitive consequences resulting from poor planning and decision making at the Upper Echelons? For reasons relating to scope, I limit the discussion of organizational Social Capital to one level of analysis. By focusing on relationships just among strategic partners, we

have not captured other potentially rich social relationships that are likely to exist across hierarchal levels within a firm. Several meaningful questions can emerge from investigating Social Capital in this manner. For example, how is Competitive Intensity affected when strong relationships exist between senior executives and components of the labor force? Further, what does it mean to the Social Capital and Competitive Intensity relationship when senior management adopts a more egalitarian or democratic culture as opposed to a more autocratic one? These questions reveal the potential in adopting a broader perspective of firm Competitive Intensity.

Second and in regard to HR systems, the lion's share of discussion has focused on executive compensation. This focus is well deserved because of the motivational properties embedded within compensation plans. Other HR functions, however, meaningfully influence a firm's human assets, and, by so doing, should impact a firm's awareness, motivation, and capability to compete (Chen, 1996). Investigation into other HR functions should prove a worthwhile endeavor. For example, expansive recruiting efforts and rigorous selection standards are likely to increase the initial levels of a firm's Human Capital. Once within the firm, executive-training programs at the apex, or workforce training throughout the organization, is likely to develop and refine a firm's Human Capital. Maybe more important than the type of HR function is the nature of a firm's HR practices. For instance, Arthur (1994) developed a taxonomy of HR systems, which he identified as either "control" or "commitment" oriented. Further, he found that firms that applied "commitment" based HR functions to their workforce improved organizational performance. Since commitment has been identified as an instrumental factor in securing and developing Human Capital (Coff, 1997), it would be interesting to determine the impact of a firm's HR orientation ("control" or "commitment") on the Competitive

Intensity of a firm. Other work has examined the innovativeness of certain HR practices and its corresponding relationship with organizational performance and outcomes (Ichniowski, Shaw, & Crandall, 1995). To the extent that innovative HR systems can drive creativity, risk taking, and spirited collaboration, one would expect a corresponding impact on a firm's Competitive Intensity. Based on this reasoning, it is likely that the Upper-Echelon model offered here only scratches the surface regarding the potential of both the type and nature of a firm's HR system on its Competitive Intensity.

Third, I only examine one half of competitive dynamics—the action. Future theoretical development and empirical testing could also examine how Human and Social Capital may influence competitive response. For instance, one could imagine a scenario where extremely high levels of Human Capital may deter competitive response. At high levels of Human Capital, competitors may socially construct or inflate individual ability of another firm's executive team. Consequently, a rival could become paralyzed by fear and fail to respond or delay their response. Several competitive dynamics researchers use military strategy to reinforce certain competitive points (D'Aveni, 1994). Using a similar practice, this point can easily be seen in the Civil War battle of Chancellorsville where General Robert E. Lee defeated a Union Army three times its size. Many contemporary historians believe that Union inaction and the gross failure to respond despite having known superior resource advantages was simply due to the legend and fear of GEN Lee as a leader and military strategist (Freeman, 1997). In summary, just as high levels of Human Capital may serve as symbols for legitimacy, it is plausible that it can also deter rival firms from attacking or responding. Since action response is critical in competitive dynamics (Chen & Hambrick, 1995), future research may want to pursue this line of inquiry.

Finally, future theory building may want to incorporate both human and non-human resources to arrive at a more comprehensive theoretical model. When integrated, the predictive power of such a theory should be robust. It is likely that the absence of one or the other forms of capital (human or non-human) constrains the Competitive Intensity of a firm. Take, for instance, a firm with large financial resources and high organizational slack, but low levels of human forms of capital. In this scenario, the firm possesses great resources to engage in spirited rivalry, but the strategic partners may be either unaware or lack the cognitive wherewithal to deploy their non-human assets in a competitively astute or sophisticated manner. Conversely, a bright, innovative, and integrated cohort of strategic partners that exhibit high levels of Human and Social Capital may be constrained internally from a lack of non-human assets (e.g., financial/liquid assets). Not surprisingly, a firm's Competitive Intensity is likely at its highest when the firm possesses high human forms of capital coupled with non-human firm assets in which to deploy. Empirical examination into this could be accomplished by including both types of assets as predictors into the regression model. As the competitive dynamics research stream continues to progress, models that account for both human and non-human resources should become the order of the day.

In addition to these possible research venues, there is also room in the competitive behavior research agenda to address important construct and measurement related issues. An ancillary pursuit in this dissertation was to set the stage for more refined, and sophisticated thinking regarding the idea of Competitive Intensity. A thorough review of the literature reveals certain themes that seem instrumental in securing a competitive advantage. They are competitive volume, variety, and force. While each dimension of a firm's competitive repertoire is important, firms are likely to attain a market advantage when they adopt all three critical

dimensions into their competitive repertoire. Competitively intense firms indicate that a firm is aggressive and sophisticated in its competitive activity. Accordingly, rival firms may face response issues to actions that they view as aggressive, complex, and forceful. Since all three dimensions have been separately affirmed as important to a firm's competitive behavior, there may be a theoretical and empirical imperative to explore a construct that incorporates these dimensions. The intercorrelations of the major dimensions of Competitive Intensity in Table 5.1 provide preliminary evidence that these variables are distinct and separate. Follow on analysis and the testing of a three dimensional versus single higher order factor model could contribute to the development and understanding of this construct.

In summary, I argue and provide some preliminary evidence that the competitive behavior of a firm is enhanced through the talent, knowledge, and skills that exist both within individuals and the relationships between key executives. Further, it appears that these intangible assets can be influenced by as executive compensation plans, which impacts firm competitive behavior. The Upper-Echelon perspective outlined here should not only strengthen and enrich the empirical and theoretical foundations of competitive behavior but also is in direct response to calls for studying and better understanding the strategic choice that underlie all firm competitive activity (Smith *et al.*, 2001).

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8.0 APPENDICES

8.1 Appendix A: Definition and Listing of Action Categories²

For Coding Competitive Actions of Global Pharmaceutical Firms

(The functional groupings such as marketing and production are meant only for tentatively organizing the actions to make them cognitively easier to understand)³

Marketing

Price

1. **Price increase**—Raising the price for one or more products.
2. **Price decrease**—Reducing the price for one or more products.
3. **Change in pricing structure**—Modifying the overall pricing structure (e.g. increasing or decreasing bulk discount percentage or changing dealer commissions).
4. **Entry (temporary) price cut**—A price reduction that is clearly associated with a firm's entry into a new market.

Advertising/Promotion

5. **Change in advertising/promotion approach** (e.g. direct to Consumer/DTC, office promotion, providing samples to health care providers, journal advertisement, E-commerce, hospital promotion).
6. **Achievement of Major endorsements**—Applying for and gaining the endorsement of the firm's product by a major organization (e.g. an HMO or physicians' organization) or a famous person (e.g. professional athlete).

Product/service—A specific move focused on a particular product or service (including after sale service) *within* a product-market segment in which the firm is already active.

7. **Launching of new product/service**—Introducing a new product or service in a product/market segment including a geographic region in which the firm is already active.
8. **Withdrawal of product/service**—Withdrawing a product or service while remaining in a product/market segment.
9. **Product/service improvement**—Adding features or specifically improving the quality of an existing product or service (e.g. changing the state of drug from

² These listings were primarily generated through qualitative interviews with high-level managers within the pharmaceutical industry.

³ Coding decision rules are included at the end of these action definitions and listings

pill to suspended form, repackaging the drug, and slight modifications such as the time-delayed release of the drug).

10. ***Changing classification of product***—declassifying a drug from prescriptive to Over-the-Counter (OTC) status, or vice versa.
11. ***Increased emphasis on existing product***—Purposeful effort by firm to stress or accent an existing product (e.g. spending more marketing dollars, more investment, or increased expenditures in support of a product).
12. ***Decreased emphasis on existing product***—Purposeful effort by firm to lessen commitment to an existing product (e.g. spending fewer marketing dollars, less investment, or reduced expenditures in support of a product).

Distribution

13. ***Creation of new distribution channel***—Opening of a distribution line that was previously non-existent.
14. ***Change in distribution channel***—Altering a current distribution channel.

Production/Operations

Production Volume: A specific volume-related move as follows (not an increase or decrease in installed capacity).

15. ***Production increase***—Increasing the actual volume of production of a drug.
16. ***Production decrease***—Decreasing the actual volume of production of a drug.

Production Capacity: A specific-capacity related move as follows (not a temporary increase or decrease in actual production).

17. ***Capacity increase***—Increasing the installed production capacity.
18. ***Capacity decrease***—Decreasing the installed production capacity.

Production Units

19. ***Opening new production unit***—opening of new production facility.
20. ***Closing a production unit***—closing of existing production facility.

Productivity Improvement

21. ***Operational efficiency enhancement***—Actions such as re-engineering, total quality management, business process improvement, and enterprise resource planning that are aimed at enhancing operational drug making efficiency. This action does not involve the implementation of technology; rather it involves the alteration of processes.

Technology/R&D

Technology

22. ***Acquiring new technology for drug discovery***—Acquiring and installing any new technology useful in the drug discovery process.
23. ***Acquiring new technology for drug manufacturing***—Acquiring and installing any new technology aimed primarily at improving the manufacturing or production process.

24. ***Developing new technology for drug discovery***—The in-house development of technology that aims to improve the firm’s ability to discover new drugs.
25. ***Developing new technology for drug manufacturing***—The in-house development of technology that aims to improve the drug manufacturing/production process.
26. ***Acquiring intellectual property rights***—Acquiring the rights to intellectual property developed outside the firm (e.g. licenses, copyrights, patents, and trademarks).
27. ***Selling intellectual property rights***—Selling the rights to intellectual property developed by the firm (e.g. licenses, copyrights, patents, and trademarks).
28. ***Performing In-house scientific trials***—Conducting or announcing the completion of scientific research within the firm on a product that is currently in use (e.g. a firm conducts its own internal trials); these trials are discretionary and are not to be confused with FDA mandated clinical trials, which is action #31.

R&D Process

29. ***FDA filing***—The filing of a new drug with the FDA.
30. ***Discovery of a new molecule***—A significant scientific discovery in which the firm discovers a new molecule.
31. ***Conducting clinical tests***—Performing clinical tests that are mandated by the FDA to achieve FDA approval. The coded news items will often be the results of these clinical tests. This is different from Action #28 in that these test trials are not optional for the firm to undertake.
32. ***Discovering New application of existing drug***—An action in which a firm determines that an existing drug addresses a distinctly separate condition or population subgroup (e.g. drug previously thought to lower cholesterol also lowers blood pressure, drug previously used for men is found useful for women).
33. ***Patent filing***—The necessary actions that a firm takes to file a patent with the United States Patent and Trademark office.

R&D Investment

34. ***Increase in R&D investment***—An increase in the amount of resources devoted to R&D (can include financial, capital, and human forms of investment).
35. ***Decrease in R&D investment***—A decrease in the amount of resources devoted to R&D (can include financial, capital, and human forms of investment).

Management/Human Resources

36. ***Compensatory practices***—Actions taken to change, alter, or modify the compensatory practices of significant groupings of employees within the firm.

37. **Major Recruiting/Selection Initiative**—Specific hiring practices aimed at improving the competitiveness of the firm (e.g. hiring 3000 representatives for launching of a new drug).
38. **Major Training/Development Initiatives**—HR practice aimed at improving the work force (may address soft skills such as diversity training as well as hard skills such as product education).

Aspects of Value Chain Not Captured Elsewhere

39. **Inbound logistics**--Actions associated with receiving, storing, and disseminating inputs to production process (e.g. material handling, warehousing, inventory control).
40. **After sales service**—Actions associated with providing service to enhance or maintain the value of the product (e.g. training physicians on the side effects of the product or teaching nurses how to properly administer the product).
41. **Procurement**-Actions associated with purchasing of inputs (e.g. qualifying new suppliers, monitoring of supplier performance, machinery and equipment) or of general materials (e.g. computers).

Corporate

Specific Product/Market Segment—A move focused on a specific product/market segment (e.g. anti-depressants vs. antibiotics).

42. **E-Commerce initiative**—Utilizing the internet or web into business operations (e.g. business to business e-commerce interaction).
43. **Entry into product/market**—Entering a product-market segment in which the firm was not a participant so far (e.g. for the first time a firm offers a generic or therapeutic equivalent in a specific market).
44. **Exit from product/market**—Withdrawing from a product/market segment in which the firm was previously a participant.

Alliance—A specific move focused on creating or dissolving an alliance (cooperative agreements regarding technical training programs, long-term supply relationships, marketing/service agreements, non-equity cooperative arrangements, JV in existing unit, Greenfield joint ventures).

45. **Customer alliance**—The creation or dissolution of an alliance with a downstream partner (e.g. hospitals, insurance companies, HMOs, or pharmacies).
46. **Competitor alliance**—The creation or dissolution of an alliance with a horizontal partner.
47. **Supplier alliance**—The creation or dissolution of an alliance with an upstream partner.
48. **Other alliance**—The creation or dissolution of an alliance with a partner who does not belong to any of the above categories.

Vertical Integration—A specific move related to the firm's extent of vertical integration as follows:

49. ***Increase in vertical integration***—The acquisition or creation of an owned unit or joint venture (upstream or downstream) that increases the firm's extent of vertical integration (e.g. firm purchase of pharmacies).
50. ***Decrease in vertical integration***—The divestment or dissolution of an owned unit or joint venture (upstream or downstream) that decreases the firm's extent of vertical integration (e.g. a firm sells off its pharmacies).

Intra-Industry Acquisition:

51. ***Increased horizontal integration***—Acquisition of any drug company, drug manufacturing facility, drug testing company, or R&D unit.
52. ***Decreased horizontal integration***—Divestment in the form of sale or closure of any drug business unit, R&D facility, manufacturing site, or related business unit.
53. ***Other acquisition***—Acquisition of any non-drug business unit or operation.
54. ***Divestment of other assets***—Sale or closure of non-drug business units (e.g. real estate or property divestment).

Organizational restructuring—Significant changes in internal organizational structure and systems (primarily focused on improving overall organizational efficiency) by eliminating divisions, departments, hierarchies; downsizing by reducing the number of employees.

55. ***Administrative efficiency enhancement***—Actions such as installing new management information systems and related computers that are aimed at enhancing administrative efficiency.
56. ***Structural changes***—Organizational structure-based actions, such as elimination of divisions, departments, hierarchies that are focused on achieving organizational efficiency.
57. ***Downsizing/layoffs***--Actions focused on reducing the number of employees.

Legal and Lobbying Actions

58. ***Political/Bureaucratic lobbying***—Actions taken to influence governments and related stakeholders in favor of the firm or the drug industry. This entails communication directed towards a regulatory government agency in an effort to influence bureaucratic decision- making (e.g. FDA).
59. ***Lawsuits against competitor***—Legal actions taken against another drug firm.
60. ***Lawsuits against others*** (e.g. suppliers, customers, etc.)—Any legal action against external stakeholders other than competitors.
61. ***Filing of patent infringements***—A regulatory or legal action undertaken by a competitor to prevent other companies from capitalizing on an existing patent.

Gaining Approvals from Regulatory Agencies and Major Stakeholders

62. ***Securing FDA approval***—Gaining favorable FDA approval to manufacture a drug for public use.
63. ***Receiving FDA disapproval***—FDA final decision to disapprove the drug for public use.
64. ***Securing Patent approvals***—Earning patent rights by the United States Patent and Trademark office.
65. ***Patent expiration***—Firm actions that accompany and are associated with the expiration of a patent.
66. ***Securing other regulatory approvals***—Any other regulatory approval (except by the FDA, which is # 59) such as by the Federal Trade Commission, international regulatory agencies, regulatory bodies from other countries (e.g. the European Union or World Health Organization).

Public Relations/Ethical Orientation

67. ***Positive public relations***—Socially responsible actions, such as corporate giving, specific positive steps to influence reputation, ethical based initiatives, and environmentally friendly actions.
68. ***Negative public relations***—Socially irresponsible actions to include ethical breaches, corruption, price collusion, and environmentally unfriendly actions etc.
69. ***Other Competitive Actions***—any competitive action that is not encompassed by the above codes. Note: coders need to note the nature of action in the remarks column.
70. ***Competitively Relevant News***—This is not an action. This item is meant to capture news that is of competitive significance or that is noteworthy and of value to those engaged in and/or monitoring the industry (e.g. news about superior performance of a drug or quarterly earnings that are above expectations). Note: Coders need to note 2-3 key words in the remarks column to describe the coded news.

8.2 Appendix B: Coding Decision Rules

KEY

1. Use the *Enhanced Title* as the primary basis for coding the data. **There is no need to drill down the text if the enhanced title suggests that the report is not relevant.** Drill down into the text ONLY IF you know that it is a relevant report but cannot discern the nature of action from the enhanced title. Don't go to the text only to find the action date; instead use the report date as action date.
2. Remember that not all reports will be relevant. News about actions taken by the company are the only relevant report for our purpose. General reports about the company are not relevant and should be coded as NA in the "action code" column. **If the report is coded as NA, there is no need to complete the rest of the columns**
3. Many reports will be "repeats" of the same basic action—in such cases, only the first report is to be coded; code all others as **RP** in the "action code" column. **If the report is coded as RP, there is no need to complete the rest of the columns.**
4. In order to be able to catch the earliest report of an action, always code from the back of the file—e.g., in a file with 175 records, code in the order of record 175, 174, 173... (This is necessary because the data file has records in reverse chronological order).
5. Some reports will have multiple actions in them. In such cases, all actions are to be coded. Code each such action in a separate row. **Thus, when there are multiple actions in a report, the coding sheet will have multiple rows for that report.**
6. The *R/NA* and *Link* columns are for capturing any action sets that may be related to each other in the sense of being action-response pairs or sequences. For example, while coding a Merck action, if we recognize it as a response to another firm's action, we should note "R" in the *R/NA* column and note the record number with details of the other firm's action (if available) in the *Link* column. If the record number of the other firm's action is not available, any information that would be helpful to track down that action should be entered in the *Link* column. (For example, we may remember some sketchy details from another file we coded earlier.) The goal is to flag all *potential* action-response pairs (so that we can track them down later), not necessarily to capture all the details at this stage.
7. Use the "Remarks" column for specifying important information not captured in the coding sheet. For example, you should (1) note some key words to capture the exact nature of action if an action is coded as "General Action" (#.., and (2) note any issues you may want to remember or revisit during the reconciliation phase.
8. In case of a diversified company only the actions pertaining to the pharmaceutical industry or the pharmaceutical subsidiary are relevant for coding. Others should be coded as NR.
9. An action will be coded as international if it has any of these conditions: (a) aimed at non-domestic market of the firm (import or export); (b) investment in a foreign country; and (c) alliance relationship with a non-domestic partner. Domestic actions taken because of increased competitive pressure from foreign competitors will not qualify as international actions.
10. Save one coded excel file per period per company by using the following file name format: companyname-year.xls. Thus, if you coded five years of data for the same company, you need to have five different excel files.

OTHER RULES

11. If an event is mentioned retrospectively in a report about another event:
 - a. Include it if it can be dated as during the time frame of interest (e.g., you are coding 2001 data and the event is of 2001);
 - b. Otherwise, do not include it.
12. "Increase in R&D" (action # ... should literally be a reported increase in the resources devoted to R&D. Normal, ongoing R&D expenditure should not be included in this action.
13. Outcome reports with news of outcomes of earlier actions are not to be included—e.g., outcome of a legal case which was filed earlier. However, see #11 above.
14. If a firm closes a single unit, code it as "plant closing." If multiple units are being closed, code it as "organizational restructuring."
15. Remember, any action will be coded as "General Action" (action # ...) only if the action does not fit to the other kinds of actions.

Rules/Notes on Various Columns of the Data Coding Sheet

No.: Simple sequence number for each year's records.

Year: Year of the data file (such as 2001)

Record #: Record # as mentioned in the news report

Action Code: Codes range from 1 to .. as specified in the Word file, "Coding Structure." If the report is not relevant, write NA in this column and proceed to the next news record. If the report is repetition of earlier report, write RP and proceed to the next record. There is no need to fill in rest of the columns if the report is not relevant or is a repeat report.

Sub Code: Applies only to action # Refer to the "Coding Structure" file. The cells are preprogrammed to (a) ask for sub code if the action code you entered in the preceding column needs a sub code, and (b) automatically enter NA if no sub code is needed.

Past action/Signal: Code "0" if an action has already taken place. Code "1" if the report is a signal or the firm's intent to take the action (examples of key words that indicate a signal are: vows, promises, says, seeks, aims, intends, mulls, is studying, is considering)

Title or Text: write "T" if you had to go to the text in order to code the action.

Report Date: Date of the news report

Action Date: Date of the action as reported. Write NA if not available

R/NA: Response to competitors' move (R); Not Available (NA). An action should be coded as a response "R" only if it is in response to competitors' prior actions. Response to general trends should not be coded as response (but should be coded as NA).

Link: Relevant only if the report is a response to other firms' actions (i.e., coded as "R" in the preceding column). In that case, note any information (including the prior record number) that would be helpful to track down that action. The cells are preprogrammed to (a) ask for link if you entered "R" in the preceding column, and (b) automatically enter NA if no link is to be mentioned.

Remarks: Note any remarks, if necessary. For example, you should (1) note some key words to capture the exact nature of action if an action is coded as "Other Action" (69), and (2) note any issues you may want to remember or revisit during the reconciliation phase.

8.3 Appendix C: Coding Verification

1. (37) *Abbott Labs' Ross Products division will begin marketing a soy protein powder shake called Health Source.*

_____ First Choice: _____ Second Choice: _____

2. (14) *Bausch & Lomb is entering the corrective eye surgery market, with 400,000 Americans having corrective surgery in 1998 vs. 180,000 in 1997.*

_____ First Choice: _____ Second Choice: _____

3. (113) *BMS Westwood Squibb Pharmaceuticals launches Pre Sun Fisher Price Sunscreen for Kids; the waterproof lotion offers an SPF of 30.*

_____ First Choice: _____ Second Choice: _____

4. (1) *Carter Wallace is adding 25,000 sq ft. to 220,000 sq ft condom plant in Colonial Heights, VA; plant will have almost 245,000 sq ft after expansion is completed; sales of Trojan condoms rose almost 10% to 114.1 mil in 1998.*

_____ First Choice: _____ Second Choice: _____

5. (28) *Cephalon's Provigil was approved by the FDA for narcolepsy symptoms: Predictions for Provigil's 1999 sales are 12.5 mil, growing to \$90 million by 2001.*

_____ First Choice: _____ Second Choice: _____

6. (27) *DepyCyt will be marketed in US by Chrion.*

_____ First Choice: _____ Second Choice: _____

7. (7) *Cor Therapeutics' oral glycoprotein IIb/IIIa inhibitor cromafiban has shown effective dose-dependent inhibition of platelet aggregation in Phase I and early Phase II trials.*

_____ First Choice: _____ Second Choice: _____

8. (4) *Dura Pharmaceuticals Maxipime injection treatment for empiric monotherapy pediatric patients receives approval from Food & Drug Administration.*

_____ First Choice: _____ Second Choice: _____

9. (14) *ICN Pharmaceuticals and Schering Plough launch Rebetol in Germany for use in combination with Schering's Intron A for treating hepatitis C.*

_____ First Choice: _____ Second Choice: _____

10. (6) *Immologic Pharmaceutical Corp will sell assets following setbacks in development of drugs to combat allergies and treat multiple sclerosis.*

_____ First Choice: _____ Second Choice: _____

11. (28) *IVAX's Paxene cleared in Europe: IVAX's Paxene anticancer therapy has received pan-European approval; Paxene indicated as an AIDS-related Kaposi's sarcoma treatment for patients failing liposomal anthrocycline treatment.*

_____ First Choice: _____ Second Choice: _____

12. (50) *Eli Lilly & Co sells it Lorabid antibiotic in the US and Puerto Rico to King Pharmaceuticals for \$158 million.*

_____ First Choice: _____ Second Choice: _____

13. (1) *Marsam Pharmaceuticals voluntarily recalls products and ingredients made at its Cherry Hill, NJ, facility; recall is in response to investigation into record keeping and lab deficiencies.*

_____ First Choice: _____ Second Choice: _____

14. (12) *Medicis Pharmaceutical launches Lustra-AF as line extension of Lustra.*

_____ First Choice: _____ Second Choice: _____

15. (3) *Merck & Co teams up with Oxford GlycoSciences to apply proteomics to diabetes research; financial terms remain undisclosed.*

_____ First Choice: _____ Second Choice: _____

16. (8) *Schein Pharma and MGI end promotional relationship on INFeD. Schein Pharmaceuticals and MGI Pharma terminate their co-promotion agreement for the iron dextran injection INFeD, the leading injectible iron treatment on the US market.*

_____ First Choice: _____ Second Choice: _____

17. (4) *Phar-Mor, NBTY to sell vitamins on the Internet.*

_____ First Choice: _____ Second Choice: _____

18. (104) *Inhale Therapeutics and Pfizer testing inhalable insulin product in Phase III of clinical trial.*

_____ First Choice: _____ Second Choice: _____

19. (79) *Rhone Poulenc is marketing Dioralyte Relief Oral Rehydration Therapy in Blackcurrant and Raspberry flavors.*

_____ First Choice: _____ Second Choice: _____

20. (9) *Scherer Corps signs supply agreement with GlaxoWellcome.*

_____ First Choice: _____ Second Choice: _____

8.4 Appendix D: Managerial Assessments of Competitive Moves within the Pharmaceutical Industry⁴

Positions Held in Firm: _____	Firm Tenure: _____	Industry Tenure: _____					
		SIG	SC	V/N	R	RA	IR
1. In general, rate the significance of pricing actions within your industry.		___	___	___	___	___	___
2. <i>Price increase</i> -Raising the price for one or more of your products.		___	___	___	___	___	___
3. <i>Price decrease</i> - Reducing the price for one or more of your products.		___	___	___	___	___	___
4. <i>Change in pricing structure</i> -Modifying the overall pricing structure (e.g. increasing or decreasing bulk discount percentage or changing dealer commissions).		___	___	___	___	___	___
5. <i>Entry (temporary) price cut</i> -A price reduction that is clearly associated with a entry into a new market.		___	___	___	___	___	___
6. In general, rate the significance of advertising and promotion actions within your industry.		___	___	___	___	___	___
7. <i>Change in advertising/promotion approach</i> (e.g. direct to consumer/DTC, office promotions, providing samples to health care providers, journal advertisement, E-commerce, or hospital promotions).		___	___	___	___	___	___
8. <i>Achievement of major endorsements</i> -Endorsement of the firm's product by a a major organization (e.g. an HMO or physicians' organization) or a famous person (e.g. professional athlete).		___	___	___	___	___	___
9. In general, how important are product and service actions within your industry.		___	___	___	___	___	___
10. <i>Launching of a new product or service.</i>		___	___	___	___	___	___
11. <i>Withdrawing of product or service from the market.</i>		___	___	___	___	___	___

⁴ Pharmaceutical Professionals were instructed to rate the following actions on a given action characteristic (e.g., action significance) on a 5-point Likert scale.

	SIG	SC	V/N	R	RA	IR
12. Product/Service improvement —Adding features or specifically improving the quality of an existing product or service (e.g., changing the state of the drug from pill to suspended form or repackaging the drug).	___	___	___	___	___	___
13. Changing classification of product —declassifying a drug from prescriptive to Over-the-Counter (OTC) status, or vice versa.	___	___	___	___	___	___
14. Increased emphasis on existing product —Purposeful effort by firm to stress or accent an existing product (e.g. spending more marketing dollars, more investment, or increased expenditures in support of a product).	___	___	___	___	___	___
15. Decreased emphasis on existing product —Purposeful effort by firm to lessen commitment to an existing product (e.g. spending fewer marketing dollars, less investment, or reduced expenditures in support of a product).	___	___	___	___	___	___
16. In general, how significant are distribution related actions within your industry.	___	___	___	___	___	___
17. Creation of new distribution channel —Opening of a distribution line that was previously non-existent.	___	___	___	___	___	___
18. Change in distribution channel —Altering a current distribution channel.	___	___	___	___	___	___
19. In general, how important are production related moves within your industry.	___	___	___	___	___	___
20. Production increase —Increasing the actual volume of production of a drug.	___	___	___	___	___	___
21. Production decrease —Decreasing the actual volume of production of a drug.	___	___	___	___	___	___

	SIG	SC	V/N	R	RA	IR
22. <i>Capacity increase</i> —Increasing the installed production capacity.	___	___	___	___	___	___
23. <i>Capacity decrease</i> —Decreasing the installed production capacity.	___	___	___	___	___	___
24. <i>Opening new production unit</i> —opening of new production facility.	___	___	___	___	___	___
25. <i>Closing a production unit</i> —closing of existing production facility.	___	___	___	___	___	___
26. <i>Operational efficiency enhancement</i> —Actions such as re-engineering, total quality management, business process improvement, and enterprise resource planning that are aimed at enhancing operational drug making efficiency. This action does not involve the implementation of technology; rather it involves the alteration of processes.	___	___	___	___	___	___
27. In general, how important are technology related actions within your industry.	___	___	___	___	___	___
28. <i>Acquiring new technology for drug discovery</i> —Acquiring and installing any new technology useful in the drug discovery process.	___	___	___	___	___	___
29. <i>Acquiring new technology for drug manufacturing</i> —Acquiring and installing any new technology aimed primarily at improving the manufacturing or production process.	___	___	___	___	___	___
30. <i>Developing new technology for drug discovery</i> —The in-house development of technology that aims to improve the firm’s ability to discover new drugs.	___	___	___	___	___	___
31. <i>Developing new technology for drug manufacturing</i> —The in-house development of technology that aims to improve the drug manufacturing/production process.	___	___	___	___	___	___

	SIG	SC	V/N	R	RA	IR
32. <i>Acquiring intellectual property rights</i> —Acquiring the rights to intellectual property developed outside the firm (e.g. licenses, copyrights, patents, and trademarks).	___	___	___	___	___	___
33. <i>Selling intellectual property rights</i> —Selling the rights to intellectual property developed by the firm (e.g. licenses, copyrights, patents, and trademarks).	___	___	___	___	___	___
34. <i>Performing In-house scientific trials</i> —Conducting or announcing the completion of scientific research within the firm on a product that is currently in use (e.g. a firm conducts its own internal trials); these trials are discretionary and are not to be confused with FDA mandated clinical trials, which is action #31.	___	___	___	___	___	___
35. In general, how significant is R&D actions within your industry?	___	___	___	___	___	___
36. <i>FDA filing</i> —The filing of a new drug with the FDA.	___	___	___	___	___	___
37. <i>Discovery of a new molecule</i> —A significant scientific discovery in which the firm discovers a new molecule.	___	___	___	___	___	___
38. <i>Conducting clinical tests</i> —Performing clinical tests that are mandated by the FDA to achieve FDA approval. The coded news items will often be the results of these clinical tests. This is different from Action #28 in that these test trials are not optional for the firm to undertake. 71.	___	___	___	___	___	___
39. <i>Discovering New application of existing drug</i> —An action in which a firm determines that an existing drug addresses a distinctly separate condition or population subgroup (e.g. drug previously thought to lower cholesterol also lowers blood pressure, drug previously used for men is found useful for women).	___	___	___	___	___	___

	SIG	SC	V/N	R	RA	IR
40. Patent filing —The necessary actions that a firm takes to file a patent with the United States Patent and Trademark office.	___	___	___	___	___	___
41. Increase in R&D investment —An increase in the amount of resources devoted to R&D (can include financial, capital, and human forms of investment).	___	___	___	___	___	___
42. Decrease in R&D investment —A decrease in the amount of resources devoted to R&D (can include financial, capital, and human forms of investment).	___	___	___	___	___	___
43. In general, how significant are Human Resource Management practices within your industry?	___	___	___	___	___	___
44. Compensatory practices —Actions taken to change, alter, or modify the compensatory practices of significant groupings of employees within the firm.	___	___	___	___	___	___
45. Major Recruiting/Selection Initiative —Specific hiring practices aimed at improving the competitiveness of the firm (e.g. hiring 3000 representatives for launching of a new drug).	___	___	___	___	___	___
46. Major Training/Development Initiatives —HR practice aimed at improving the work force (may address soft skills such as diversity training as well as hard skills such as product education).	___	___	___	___	___	___
47. Inbound logistics --Actions associated with receiving, storing, and disseminating inputs to production process (e.g. material handling, warehousing, inventory control).	___	___	___	___	___	___
48. After sales service —Actions associated with providing service to enhance or maintain the value of the product (e.g. training physicians on the side effects of the product or teaching nurses how to properly administer the product).	___	___	___	___	___	___

	SIG	SC	V/N	R	RA	IR
49. Procurement —Actions associated with purchasing of inputs (e.g. qualifying new suppliers, monitoring of supplier performance, machinery and equipment) or of general materials (e.g. computers).	___	___	___	___	___	___
50. E-Commerce initiative —Utilizing the internet or web into business operations (e.g. business to business e-commerce interaction).	___	___	___	___	___	___
51. Entry into product/market —Entering a product-market segment in which the firm was not a participant so far (e.g. for the first time a firm offers a generic or therapeutic equivalent in a specific market).	___	___	___	___	___	___
52. Exit from product/market —Withdrawing from a product/market segment in which the firm was previously a participant.	___	___	___	___	___	___
53. Customer alliance —The creation or dissolution of an alliance with a downstream partner (e.g. hospitals, insurance companies, HMOs, or pharmacies).	___	___	___	___	___	___
54. Competitor alliance —The creation or dissolution of an alliance with a horizontal partner.	___	___	___	___	___	___
55. Supplier alliance —The creation or dissolution of an alliance with an upstream partner.	___	___	___	___	___	___
56. Other alliance —The creation or dissolution of an alliance with a partner who does not belong to any of the above categories.	___	___	___	___	___	___
57. Increase in vertical integration —The acquisition or creation of an owned unit or joint venture (upstream or downstream) that increases the firm’s extent of vertical integration (e.g. firm purchase of pharmacies).	___	___	___	___	___	___

	SIG	SC	V/N	R	RA	IR
58. Decrease in vertical integration —The divestment or dissolution of an owned unit or joint venture (upstream or downstream) that decreases the firm’s extent of vertical integration (e.g. a firm sells off its pharmacies).	___	___	___	___	___	___
59. Increased horizontal integration —Acquisition of any drug company, drug manufacturing facility, drug testing company, or R&D unit.	___	___	___	___	___	___
60. Decreased horizontal integration —Divestment in the form of sale or closure of any drug business unit, R&D facility, manufacturing site, or related business unit.	___	___	___	___	___	___
61. Other acquisition —Acquisition of any non-drug business unit or operation.	___	___	___	___	___	___
62. Divestment of other assets —Sale or closure of non-drug business units (e.g. real estate or property divestment).	___	___	___	___	___	___
63. Administrative efficiency enhancement —Actions such as installing new management information systems and related computers that are aimed at enhancing administrative efficiency.	___	___	___	___	___	___
64. Structural changes —Organizational structure-based actions, such as elimination of divisions, departments, hierarchies that are focused on achieving organizational efficiency.	___	___	___	___	___	___
65. Downsizing/layoffs --Actions focused on reducing the number of employees.	___	___	___	___	___	___
66. Political/Bureaucratic lobbying —Actions taken to influence governments and related stakeholders in favor of the firm or the drug industry. This entails communication directed towards a regulatory government agency in an effort to influence bureaucratic decision making (e.g. FDA).	___	___	___	___	___	___

	SIG	SC	V/N	R	RA	IR
67. Lawsuits against competitor —Legal actions taken against another drug firm.	___	___	___	___	___	___
68. Lawsuits against others (e.g. suppliers, customers, etc.)—Any legal action against external stakeholders other than competitors.	___	___	___	___	___	___
69. Filing of patent infringements —A regulatory or legal action undertaken by a competitor to prevent other companies from capitalizing on an existing patent.	___	___	___	___	___	___
70. Receiving FDA approval —FDA final decision to approve drug to be manufactured for public use.	___	___	___	___	___	___
71. Receiving FDA disapproval —FDA final decision to disapprove the drug for public use.	___	___	___	___	___	___
72. Receiving Patent approval —The recognition and awarding of patent rights by the United States Patent and Trademark office.	___	___	___	___	___	___
73. Patent expiration —Firm actions that accompany and are associated with the expiration of a patent.	___	___	___	___	___	___
74. Receiving other regulatory approval —Any other regulatory approval (not FDA) such as by the Federal Trade Commission, international regulatory agencies, regulatory bodies from other countries (e.g., the European Union or World Health Organization).	___	___	___	___	___	___
75. Positive public relations —Socially responsible actions, such as corporate giving, specific positive steps to influence reputation, ethical based initiatives, and environmentally friendly actions.	___	___	___	___	___	___
76. Negative public relations —Socially irresponsible actions to include ethical breaches, corruption, price collusion, and environmentally unfriendly actions etc.	___	___	___	___	___	___

CHARACTERISTIC DEFINITIONS

Action Significance: Involves the worth and consequences associated with a competitive move. Significant actions create value to the firm. Significant moves are instrumental in generating higher profits and a competitive advantage. For example, applying a rating of **1** to an action indicates that the launching of the move provided no or little benefit to the organization. It was an expense of firm resources that produced little return. Conversely, a rating of **5** indicates that this action is crucial, critical, and central to a profit and market share advantage.

Action Scope. This refers to the extent of a firm's operations that are affected by a competitive move. For instance, applying a rating of **1** would indicate that the action impacts a very small portion of a company's operation. The action would be narrow in scope. Conversely, a rating of **5** would indicate that launching this type of action will affect or impact almost every facet of the organization's operations.

Action Visibility/Noteworthiness. Action visibility is the amount of attention that a competitive move is likely to receive in the competitive market. For example, applying a rating of **1** here would indicate when a firm launches a move, it goes undetected by competitors. Learning and detecting of these types of moves requires great effort from competing organizations. Conversely, a rating of **5** would indicate that the competitive action is easily noticed by competitors with no or little effort on their part.

Action Irreversibility. This involves engaging in actions that are difficult to reverse or undo. These actions tend to go beyond economic investment. Actions that are irreversible create legal and moral obligations to other parties, often demand high coordination, and tend to disrupt organizational systems and routines. Irreversible actions are good indicators of organizational commitment to an action. For example, a rating of **1** would indicate that the action can be reversed or undone readily without disrupting the organization and at little cost. A rating of **5** would indicate that reversing the action would be extremely difficult and require heavy resources to undo to include time and money. A rating of **5** would also indicate severe disruption to the organization if they reversed the action.

Action Risk. The variability of returns associated with an action. Risk involves potential pay-offs in conjunction with uncertainty or ambiguity. For example, applying a rating of **1** here would indicate that outcomes usually associated with this action are certain and pay-offs are low. Conversely, a rating of **5** indicates extremely large pay-offs with tremendously high thresholds of uncertainty.

Action Radicality. The extent to which an action deviates from the norms and practices of a given industry. For instance, applying a rating of **1** here would indicate that the action is quite common and expected within the industry. Conversely, applying a rating of **5** would indicate that the action is rarely undertaken and surprising within the context of the industry.

Action Significance

1

2

3

4

5

<p>Applying a rating of 1 to an action indicates that the launching of the move provided no or little benefit to the organization. It was an expense of firm resources that produced little return.</p>				<p>Conversely, a rating of 5 indicates that this action is crucial, critical, and central to a profit and market share advantage.</p>
--	--	--	--	--

Action Scope

1

2

3

4

5

<p>Applying a rating of 1 would indicate that the action impacts a very small portion of a company's operation. The action would be narrow in scope.</p>				<p>A rating of 5 would indicate that launching this type of action will affect or impact almost every facet of the organization's operations.</p>
---	--	--	--	--

Action Visibility/Noteworthiness

1	2	3	4	5
<p>A rating of 1 here would indicate when a firm launches a move, it goes undetected by competitors. Learning and detecting of these types of moves requires great effort from competing organizations.</p>				<p>A rating of 5 would indicate that the competitive action is easily noticed by competitors with no or little effort on their part.</p>

Action Irreversibility

1	2	3	4	5
<p>A rating of 1 would indicate that the action can be reversed or undone readily without disrupting the organization and at little cost.</p>				<p>A rating of 5 would indicate that reversing the action would be extremely difficult and require heavy resources to undo to include time and money. A rating of 5 would also indicate severe disruption to the organization if they reversed the action.</p>

Action Risk

1

2

3

4

5

<p>Applying a rating of 1 here would indicate that outcomes usually associated with this action are certain and pay-offs are low.</p>				<p>A rating of 5 indicates extremely large pay-offs with tremendously high thresholds of uncertainty.</p>
--	--	--	--	--

Action Radicality

1

2

3

4

5

<p>Applying a rating of 1 here would indicate that the action is quite common and expected within the industry.</p>				<p>Applying a rating of 5 would indicate that the action is rarely undertaken and surprising within the context of the industry.</p>
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9.0 VITA

As of October 1, 2004

Evan H. Offstein

EDUCATION

Master of Science in General (Business and Government) Administration (MSA)
Central Michigan University, 2001

Bachelor of Science (BS) in American Politics (Minor in Systems Engineering)
United States Military Academy at West Point, 1994
Graduated in top 15% of class
Dean's List: 7 out of 8 semesters
Selected for Company Command: 36 out of 1048

ACADEMIC APPOINTMENTS

01/04–current Assistant Professor, **Department of Management, Frostburg State University**

09/01–12/03 Instructor, **Department of Management, Virginia Polytechnic Institute and State University**

PEER-REVIEWED JOURNAL PUBLICATIONS

Offstein, E. H., & Gnyawali, D. R. CEO compensation and firm competitive behavior: Empirical evidence from the U.S. pharmaceutical industry. *Journal of Engineering and Technology Management*. Accepted for Publication.

Offstein, E. H., Tootoonchi, A., & Harrell-Cook, G. Top management discretion and impact: Drivers of a firm's competitiveness. *Competitiveness Review*. Accepted for Publication in January 2005 issue.

Offstein, E. H., Larson, M. B., McNeill, A. L., & Mwale, H. M. Are we doing enough for today's graduate student? *International Journal of Educational Management*. Accepted for Publication in December 2004 issue.

Offstein, E. H., Tootoonchi, A., & Harrell-Cook, G. Executive discretion as a driver of firm competitiveness. *Competition Forum*. Accepted for Publication in October 2004 issue.

Offstein, E. H., & Shah, A. Making the decision to mentor. *SAM Management in Practice*. Accepted for Publication in October 2004 issue.

Offstein, E. H., & Gnyawali, D. R. A humanistic perspective of firm competitive behavior. *Competition Forum*. Accepted for Publication in October 2004 issue. *Winner of Best Conceptual Paper for the Annual American Society for Competitiveness Conference*.

Childers, J. P., Offstein, E. H., & Geiger, B. D. Entrepreneurship and e-commerce: Using trust to attain competitive advantage. *Competition Forum*. Accepted for Publication in October 2004 issue.

Offstein, E. H., & Morwick, J. Mentoring our way to improved quality. *Quality Progress*. Accepted for Publication in September 2004 issue.

Shah, A., Phipps, T., & Offstein, E. H. (2004). Wal-Mart Stores, Inc. 2002 case. In F. David (Ed.), *Strategic Management Cases* (10th ed.). New York: Prentice Hall.

Offstein, E. H., & Neck, C. P. (2003). From acing the test to touching base: The sports metaphor in the classroom. *Business Communication Quarterly*, 66(4), 23-35.

PAPERS UNDER REVIEW

Offstein, E. H., & Gnyawali, D. R. It pays to behave: Firm competitive behavior as a determinant of CEO pay. *Journal of Managerial Psychology*. Revise & Resubmit offered September 20, 2004.

Offstein, E. H. Revisiting the construct of power within the top management team: An empirical investigation. *Strategic Management Journal*. May 2003.

Dufresne, R., & Offstein, E. H. Student ethical development: Lessons learned from the United States Military Academy at West Point. *Academy of Management Learning and Education*. October 2003.

PROCEEDINGS PUBLICATIONS

Offstein, E. H., Shah, A., & Morwick, J. (2004). Mentoring programs and jobs: A contingency approach. *Best Paper Proceedings of the International Conference on Creating Global Competitive Advantage*, Udaipar, India.

Offstein, E. H. (2003). Revisiting the construct of power within the top management team: An empirical investigation. *Best Paper Proceedings of the Southern Management Association*, Clearwater, Florida.

PAPER PRESENTATIONS

Offstein, E., & Gnyawali, D. R. (2004). It pays to behave: Firm competitive behavior as a determinant of CEO pay. Paper presented at the annual meeting of the Academy of Management, New Orleans, LA. *Winner of the 2004 Best Doctoral Paper of the HR Division of the Academy of Management.*

Gnyawali, D. R., Offstein, E., and Srivastava, M. (2003). Intersection between executive compensation and competitive strategy: Empirical evidence from the U.S. pharmaceutical industry. Paper presented at the 2003 International Conference of the Strategic Management Society, Baltimore, MD. *Strategic Management Society/McKinsey Finalist for Best Paper Award.*

Offstein, E., Gnyawali, D. R., and Srivastava, M. (2003). Executive compensation and firm competitive behavior. Paper presented at the 2003 Annual Meeting of the Academy of Management, Seattle, WA.

TEACHING AT VIRGINIA TECH & FROSTBURG STATE UNIVERSITY

MBA Level

Strategic Change, Summer 2004 (capstone MBA)

Undergraduate Level

International Management, Spring 2004

Staffing and Development, Spring 2004

Introduction to Management, Spring 2004

Human Resources Management, Fall 2003

Human Resources Management, Fall 2002

Organizational Behavior, Spring 2002

Organizational Behavior, Fall 2001

TEACHING AND RESEARCH AWARDS

Hoover Award Winner for Teaching Excellence within the Department of Management, College of Business, Virginia Tech, May 2004.

Graduate Student of the Month at Virginia Tech for Excellence in Teaching, Research, Course work, and Citizenship, February 2003.

Finalist for Graduate Teacher of the Year at Virginia Tech, Commendation from the University, March 2003, Blacksburg, Virginia.

Phi Beta Delta Honor Society Graduate Merit Award for essay entitled, “Rethinking International Education One Classroom at a Time,” April 9, 2003, Blacksburg, Virginia.

Keynote speaker and Honorary Inductee for the Golden Key International Honor Society, November 9, 2002, Blacksburg, Virginia.

SPEAKING & CONSULTING

Keynote speaker to the Society for Human Resources (SHRM), Blacksburg Student Chapter; October 13, 2003.

Guest speaker for the Virginia Tech Engineering Honor Society, February 2002

Guest speaker for the Phi Sigma Pi National Honor Fraternity, October 2002

Panelist speaker for the Virginia Tech Career Night, October 2002

Organizational Consulting for Western Maryland Medical Group. Topic: Employee Development and Coaching; August 27, 2004.

Organizational Consulting for Legal Firm Harrison & Ford, Atlanta, GA. Topic: Diagnosis and Response to Unionization, Spring 2003.

PROFESSIONAL SERVICE

Reviewer for the Southern Management Association Annual Meeting
San Antonio, TX; 2004

PROFESSIONAL AFFILIATIONS

Academy of Management

Southern Management Association

PROFESSIONAL EXPERIENCE

NOV 00-AUG 01

Assistant Commandant for Logistics and Personnel; Virginia Military Institute; Lexington, VA

Responsible for all logistics and personnel actions for 1200 cadets at the Virginia Military Institute. Leader and manager of all major logistics operations that involve the Corps of Cadets to include furloughs, graduation, and ceremonial procedures.

- Designed and developed a leadership mentoring program that was eventually introduced by the Commandant of Cadets and other senior administrators.
- Oversaw the logistics of a cadet community service project that encompassed more than 500 cadets over 3 days throughout the Shenandoah Valley.

FEB 99-NOV 00

Group Leader; Target Corporation; Stuarts Draft, VA

Supervise, lead, and motivate 68 teammates in the largest department of Target's highest volume distribution center. Improve operations of Target's receiving department through supply-chain vision and quality control.

- Earmarked within first 30 days as "High Potential Executive"; given high visibility projects to lead and manage.
- Chosen over 70 other Target Executives to lead, manage, and implement a Corporate Common Dynamic Method that involved re-engineering the employee to management communication infrastructure.
- Selected by the General Manager within the first 60 days to lead and facilitate bi-monthly meetings of all Target Executives (90) that involved presentation and communication skills and the ability to think strategically.
- Earned one of the best Target Opinion Surveys ever in Target's Receiving department.

APR 99-JAN 00

Production Supervisor; Corning Telecommunications; Wilmington, NC

Supervise and coach a 29 person shift in the most demanding department of Corning's fiber optic production plant. Ensure customer satisfaction through quality control and meeting deadlines.

- Earned "Best Shift" honors every month of my tenure for production efficiency and output, setting a department record of 7 consecutive months of "Best Shift."
- Within 3 months increased shift's productivity by almost 20% through first listening then giving clear guidance, implementing needed changes, and reallocating resources through quality control.

APR 98-MAY 99

**Captain, Military Intelligence Officer, U.S. Army
Battalion Logistics Officer**

Managed and supervised all logistic efforts for a 415 man intelligence battalion. Directly responsible for the accountability of over 1100 major items of equipment valued in excess of \$129 million.

- On short notice, successfully supported the deployments of 80 soldiers and 15,000 lbs of equipment to 5 countries, with only a two-person shop. Gained invaluable international experience with Army Central Command (Qatar, Bahrain, and Saudi Arabia) and Army Southern Command (Ecuador, Panama, and Honduras).
- Turned in more excess and unused equipment (64 vehicles, trailers, & generators) in 45 days than last 4 supply officers did in 4 years, ridding the battalion of a \$32 million maintenance burden.

DEC 96-MAR 98

Executive Officer; Fort Gordon, GA

Second in command of a 129 person highly deployable company. Responsible for unit's logistics, maintenance, deployment readiness, security posture, common skills training, and overall operations.

- Handpicked (1 out of 11) to lead a diverse 15-person team on an experimental high threat mission to Honduras. Because of our successful pioneering, unit now has habitual relationship with Army ground forces in region.
- Developed the best maintenance plan in the battalion evidenced by a consistently higher Operational Readiness rate (over 95%) and by the unit winning 5 of 7 events during the 1997 Maintenance Gunnery competition.
- Orchestrated an Adopt-A-School program, which helped improve the grades, attendance, and discipline record of 7 middle school students. Recognized by the Commanding General of Fort Gordon as the unit's Volunteer of the Year.