THE INTERACTION OF CEO CHARACTERISTICS AND COMPENSATION STRUCTURE AS DETERMINANTS OF STRATEGIC CHANGE

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CHAPTER I

INTRODUCTION

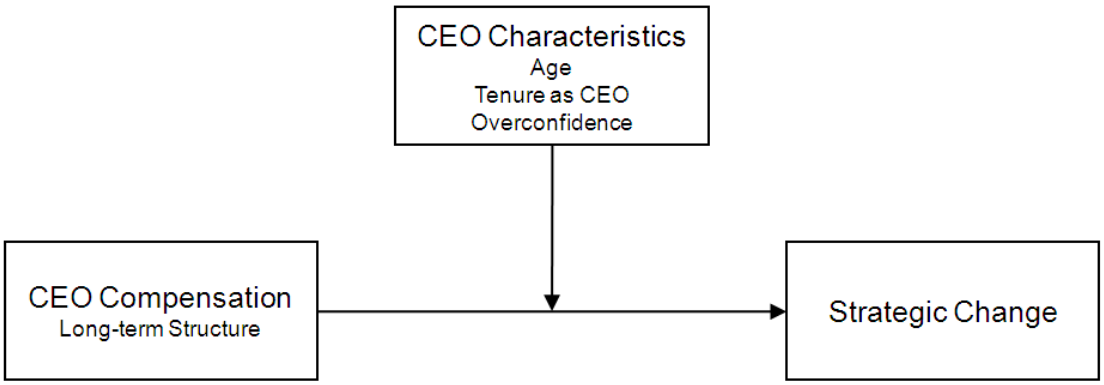
Strategic management researchers have long dealt with the question of how executives affect organizational outcomes. Much of this research has utilized one of two theoretical lenses (Cannella & Monroe, 1997; Hambrick, 2007; Jensen & Zajac, 2004). The first lens, upper echelons theory (Hambrick & Mason, 1984), emphasizes the role of executives' individual-based differences. This view argues that the characteristics of an organization's executives are related to their strategic choices (for reviews, see Carpenter, Geletkanycz, & Sanders, 2004; Finkelstein, Hambrick, & Cannella, 2009). As such, research utilizing upper echelons theory has related executive demographic and personality characteristics to organizational outcomes. The second line of research, much of which adopts an agency theory view (Fama, 1980; Jensen & Meckling, 1976), emphasizes the role of executives' situational-based differences. Accordingly, research employing agency theory has related executive compensation structures to the strategic initiatives of their organizations (for reviews, see Denis, 2001; Devers, Cannella, Reilly, & Yoder, 2007; Gomez-Mejia & Wiseman, 1997). Although these perspectives differ in emphasis, scholars have noted that a "joint consideration of insights from each stream can enhance our understanding" of how executives affect organizational outcomes (Jensen & Zajac, 2004: 507). With few exceptions (e.g. Cho & Hambrick, 2006; McLaughlin,

1991; Sanders, 2001), however, “almost no literature examines executive characteristics and compensation structures in tandem” (Hambrick, 2007: 339). Because prior studies have not accounted for personal differences that may influence how individuals respond to varying forms of compensation, we lack understanding of how individual characteristics of executives and their compensation structures jointly determine the actions of their organizations. This leads to the basic research question: “How do the individual characteristics of executives and the compensation structure under which they operate mutually affect organizational outcomes?”

This dissertation argues that individual executive characteristics moderate the relationship between executive compensation and organizational outcomes. Specifically, this dissertation analyzes the role that a chief executive officer’s (CEO) age, tenure in position, and overconfidence (Busenitz & Barney, 1997; Malmendier & Tate, 2005, 2008; Roll, 1986) play in moderating the relationship between the long-term pay structure of CEO compensation and strategic change. The relationship is depicted in Figure 1.

FIGURE 1

Framework for Studying the Interaction of CEO Characteristics and Compensation



Theoretical Basis for Research

This dissertation combines concepts from upper echelons theory and agency theory to investigate strategic change. The following section provides an overview of these three areas.

Upper Echelons Theory

As Hambrick (2007) notes, upper echelons theory is based upon two interconnected concepts:

> (1) that executives act on the basis of their personalized interpretations of the strategic situations they face, and
> (2) these personalized construals are a function of the executives' experiences, values, and personalities (page 334).

This logic is derived from the view that executives have limits in their ability to process information (March & Simon, 1958; Simon, 1947). While executives may be 'intendedly rational,' they are only limitedly so because they cannot assimilate all of the available information to arrive at a 'perfectly rational' decision (Simon, 1957). Consequently, executive decisions are not completely objective, but rather, are affected by the individualized interpretation of information (Mischel, 1977). Hambrick and Mason (1984) conceptualized upper echelons theory to explain organizational outcomes as a function of individual characteristics that affect how executives interpret, and subsequently act upon, information. In accordance with the theory, upper echelons research has related a variety of executive experiences, values, and personality characteristics to organizational outcomes (for reveiws, see Carpenter et al., 2004; Finkelstein et al., 2009).

Beyond the two main premises of the theory, Hambrick (2007) notes "two subordinate ideas, each of which seems to have stimulated major streams of research" (p. 334). The first involves the level of analysis. Researchers have analyzed both the effects of top management teams as a whole (e.g. Cho & Hambrick, 2006; Finkelstein & Hambrick, 1990; Wiersema & Bantel, 1992) as well as the CEO in isolation (e.g. Chatterjee & Hambrick, 2007; Hayward & Hambrick, 1997; Sanders, 2001). Because the management of an organization is a shared activity, studying the group of individuals (i.e. the top management team) that share in operating the organization "increases the potential strength of the theory to predict" (Hambrick & Mason, 1984: 196). On the other hand, due to the disproportionate influence of the CEO (Mintzberg, 1978; Tushman & Romanelli, 1985), some scholars have investigated the top executive alone.

While both approaches have added to our understanding of organizational outcomes, debate exists regarding the validity of aggregating the top management team (cf. Hambrick, 2007; Jensen & Zajac, 2004). Although this discussion is ongoing, scholars on both sides have acknowledged the predictive significance of utilizing only the CEO (Jensen & Zajac, 2004) because CEO's "account for a considerable portion of the variance" in organizational outcomes that "remains unexplained by contextual considerations" (Hambrick, 2007: 341). To avoid problems with aggregation of the top management team and to capitalize on the merits of analyzing the CEO alone, this dissertation investigates the characteristics of the CEO only. Throughout this dissertation the term 'executive,' 'manager,' and 'CEO' are used interchangeably to describe the chief executive officer of an organization.

The second subordinate concept of upper echelons theory is that the "demographic characteristics of executives can be used as valid, albeit incomplete and imprecise, proxies of executives' cognitive frames" (Hambrick, 2007: 335). Early work in this view utilized demographic characteristics only (e.g. Bantel & Jackson, 1989; D'Aveni, 1990; Finkelstein & Hambrick, 1990; Grimm & Smith, 1991). This approach was taken for two reasons: first, "upper level managers are not convenient to measure or even amenable to direct measurement;" and second, certain demographic characteristics (e.g. tenure, age, education and functional background) "do not have close psychological analogs" but still affect decision making (Hambrick & Mason, 1984: 196).

Despite the merits of using demography, researchers have also assessed executive personality characteristics. Some of this research has utilized direct, psychometric assessment (e.g. Busenitz & Barney, 1997; Hambrick, Geletkanycz, & Fredrickson, 1993; Miller & Droge, 1986; Miller & Toulouse, 1986; Wally & Baum, 1994). In contrast to direct measurement, researchers have developed procedures to assess executive personality characteristics using unobtrusive measures (e.g. Chatterjee & Hambrick, 2007; Hayward & Hambrick, 1997; Malmendier & Tate, 2005; 2008). These methods allow scholars to avoid problems with securing executive responses (e.g. low-response rates, non-response biases, and social desirability biases) while taking advantage of the benefits of 'nonreactive' measures (Webb, Campbell, Schwartz, & Sechrest, 1966; Webb & Weick, 1979). In this dissertation, demographic measures of age and tenure as CEO are utilized as well as unobtrusive measures of overconfidence. Overconfidence is defined as the tendency to overestimate one's own ability (Busenitz & Barney, 1997; Malmendier & Tate, 2008).

Agency Theory and Executive Compensation

One avenue to investigate the influence of executive compensation has been through the lens of agency theory (Jensen & Meckling, 1976). Agency theory explains the problems that arise when ownership and control of the organization are divided between two parties, as is the case in the public corporation (Berle & Means, 1932). As Mahoney (2005) notes,

> the separation of ownership and control produces a condition where the interests of the owner(s) and managers may, and often do, diverge and where many of the checks that formerly operated to limit the use of such discretionary managerial power disappear (page 143).

Because the agent (i.e. executive) has control over the actions of the organization but does not bear the risks of failure directly, he or she faces incentives to pursue self-interest rather than the interest of the owners (i.e. shareholders). When agents pursue self-interest, owners may suffer an 'agency loss' unless they are able to align the incentives of the agent with their own (Jensen & Meckling, 1976).

One way to align the incentives of the two parties is to structure the compensation of the executive so that it is tied to the value created for the owners (Jensen & Murphy, 1990). To accomplish this, owners can shift a greater proportion of the executive's pay to long-term forms. Long-term compensation serves to align the executive's interest with those of the owners since his or her pay is directly linked to how the organization performs over time (Carpenter, 2000; Eisenhardt, 1989; Sanders & Carpenter, 1998). Thus, long-term compensation provides incentives for the executive to focus on long-term organizational performance to maximize pay (Carpenter, 2000; Wiseman & Gomez-Mejia, 1998).

Long-term compensation is defined as the percentage of total compensation that is paid in long-term forms. Forms of payment that are considered long-term are those that are based on future value, such as stock options, restricted stock grants, and long-term incentive plan (LTIP) payouts. In contrast, short-term compensation is comprised of salary, benefits, and annual bonuses. A compensation plan is said to be long-term when a greater percentage of total compensation (i.e. the sum of long-term and short-term compensation) is comprised of long-term components. Structuring a CEO's compensation in a long-term format not only aligns the interests of the CEO with those of the shareholders (Jensen & Murphy, 1990), but also induces the CEO to engage in risk-taking (Wiseman & Gomez-Mejia, 1998) and strategic change (Carpenter, 2000).

Strategic Change

As Hofer and Schendel (1978) note, to understand why organizations perform as they do, it is important to understand the "fundamental pattern of present and planned resource deployments" that constitutes the firm's strategy (page 25). Change to this pattern over time is defined as strategic change (Amburgey & Miner, 1992; Finkelstein & Hambrick, 1990). Because of the "substantive importance of strategic change for organizational survival," the concept "has been at the center of a growing literature in both the strategy and organizational theory fields" (Fiss & Zajac, 2006: 1173) for some time (e.g. Ansoff, 1965; Chandler, 1962; Hofer & Schendel, 1978; Mintzberg, 1978; Rumelt, 1974). One of the two primary research streams investigating strategic change focuses on the role of managers in the strategic change process (Rajagopalan & Spreitzer, 1997). This view is based on the notion that because executives are responsible for

initiating strategic change, it is essential to understand the role that they play (Tushman & Romanelli, 1985).

To investigate the role of executives in strategic change, scholars have employed both executive characteristics (e.g. Bantel & Jackson, 1989; Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997; Wiersema & Bantel, 1992) and compensation structures (e.g. Carpenter, 2000; Sanders & Carpenter, 1998). Because this research has yet to analyze the two in concert, it has "implicitly assumed that corporate elites' effects" on strategic change depend only on their individual characteristics or their compensation, not the two in concert (Jensen & Zajac, 2004: 508). As a result, the conclusions that have been drawn regarding executives initiation of strategic change have been incomplete (Rajagopalan & Spreitzer, 1997) because they have not considered the possibility that how individuals respond to various forms of compensation may differ based upon their personal characteristics. By analyzing both executive characteristics and compensation in tandem, this dissertation hopes to gain a greater understanding of how executives may affect strategic change.

Contributions of the Study

This dissertation attempts to contribute to the strategic management literature in three ways. First, to enhance our understanding of strategic change, several scholars have noted the necessity of utilizing multiple theoretical viewpoints in concert (e.g. Fiss & Zajac, 2006; Lamberg, Tikkanen, Nokelainen, & Suur-Inkeroinen, 2009; Zajac, Kraatz, & Bresser, 2000; Zhang, 2006). By combining the insights gained from upper echelons and agency theories, this dissertation answers that call. Doing so may advance our knowledge of executives' role in strategic change by considering personal characteristics

that may affect how individuals respond to various forms of compensation. Second, our knowledge of executive compensation may also be enhanced. Prior research has been unable to find a consistent relationship between compensation structure and organizational outcomes (Devers et al., 2007). By accounting for individual executive characteristics that may moderate this relationship, this study adds to our knowledge of how compensation structure is related to organizational outcomes. A third and final contribution of this dissertation is to the practice of corporate governance. By understanding how personal characteristics interact with compensation structure, this dissertation may help boards of directors devise more effective executive compensation plans.

Dissertation Overview

The remainder of this dissertation is dedicated to developing and evaluating these arguments in greater detail. Chapter II is comprised of two parts: first, a literature review of upper echelons theory, agency theory, and strategic change is provided; and second, hypotheses are developed that build upon the literature review. Chapter III discusses the research methodology to be used to test the hypotheses. This includes information about the sample, the analytical techniques to be used, and the measures of constructs. The results of the analysis are presented in Chapter IV. Chapter V concludes the study with a discussion that provides implications of the results, evaluates the strengths and limitations of the dissertation, and suggests avenues for future research.

CHAPTER II

LITERATURE REVIEW AND HYPOTHESES

In this chapter, arguments are developed that combine elements from upper echelons and agency theories to assess their relationship with strategic change. Prior to doing so, a review of upper echelons and agency theories as well as strategic change is provided. Three components of the strategic change literature are covered: first, what strategic change is; second, the value of strategic change to the organization; and third, antecedents of strategic change. Hypotheses development follows the literature review.

An Overview of Upper Echelons Theory

Upper echelons theory is one of the two most utilized viewpoints for investigating the effect that executives have on the strategic initiatives of their organizations (Canella & Monroe, 1997; Hambrick, 2007; Jensen & Zajac, 2004). This view stems from what researchers call the behavioral theory of the firm or the 'Carnegie School' (Bromiley, 2005; Mahoney, 2005). The Carnegie School argues that executive "decisions are largely the result of behavioral factors rather than perfectly rational analysis based upon complete information" (Finkelstein & Hambrick, 1990: 485). The logic of this view is that executives are confronted with large amounts of information that must be analyzed and then acted upon (Mintzberg, 1973). Further, executives have limited personal resources (i.e. time, energy and cognitive capacity) with which to respond. As such, they

rely on their experiences, values, and personalities to filter the information to make it more manageable. Because of the role that executives play in crafting organizational strategy (Mintzberg, 1978), those factors that affect how executives filter information to make decisions (i.e. their experiences, values, and personalities) will also have an effect on the actions of their organization (Hambrick & Mason, 1984).

Prior to Hambrick and Mason's (1984) presentation of upper echelons theory, scholars had been investigating the role that executive experiences, values, and personalities play in decision-making. Among the first to do so were Dearborn and Simon (1958), who illustrated that managers' functional backgrounds affected how they interpreted information. Similarly, Hage and Dewar (1973) investigated the role that executives' values play in decision-making while Miller and colleagues (Miller, 1983; Miller & Friesen, 1982; Miller, Kets de Vries, & Toulouse, 1982) noted the effects of executive personality characteristics on their organizations. Building on these studies, Hambrick and Mason (1984) presented upper echelons theory to explain organizational outcomes as a product of executive experiences, values, and personalities.

Research utilizing upper echelons theory has related a number of executive demographic and personality characteristics to organizational outcomes (for recent reviews, see Carpenter et al., 2004; Finkelstein et al., 2009). For example, Bantel and Jackson (1989) investigated top management team member age and tenure and found that organizations with older and longer tenured executives were less innovative. Similarly, Smith and colleagues (Smith, Grimm, Gannon, & Chen, 1991) found that longer tenured top management teams were less likely to respond to competitive moves of rivals and Carpenter, Sanders and Gregersen (2001) found that ROA was positively related to

having a CEO with international assignment experience. Executive personality characteristics have also been analyzed. For instance, Wally and Baum (1994) found that CEO tolerance for risk was positively related to the pace at which decisions were made while Chatterjee and Hambrick (2007) found that CEO narcissism was positively related to strategic dynamism.

An Overview of Agency Theory

Like the upper echelons perspective, agency theory is also one of the two most utilized viewpoints for researching the impact that executives have on organizations' strategic initiatives (Canella & Monroe, 1997; Hambrick, 2007; Jensen & Zajac, 2004). Agency theory builds on the insights of Adam Smith (1776) and Berle and Means (1932), who noted the difference in interests between the individuals that own a firm (referred to either as owners or principals) and those that are hired to oversee its operation (referred to as either managers or agents). Because the owner(s) and the manager(s) are both self-interested, they want to maximize personal welfare. As a result, "there is good reason to believe that" the managers "will not always act in the best interests of" the owners (Jensen & Meckling, 1976: 308). When this occurs, the owners suffer what is known as 'residual loss' because the owners' overall welfare is decreased when the manager pursues self-interest rather than the interests of the owners. Jensen and Meckling (1976) formulated agency theory to explain the occurrence of incentive differences between owners and managers and offer solutions to prevent the reduction of owner welfare.

The existence of incentive differences between the owners and managers are compounded in three ways. First, owners face 'informational asymmetry' because they do not know everything that the manager is doing or everything that the manager knows.

Further, the owner may not even be aware that residual loss is occurring, let alone its severity. The owner can expend resources (i.e. time, energy and capital) to monitor the performance of the agent and reduce information asymmetry. Because those resources could be allocated in another fashion if the owner was sure that the manager would act appropriately in the absence of monitoring, expending resources in this fashion reduces the owner's welfare.

Second, even if the owner does expend resources to monitor the agent, doing so may not reduce information asymmetry because monitoring the performance of agents is problematic (Alchian & Demsetz, 1972). This is because the principal may not possess knowledge of the tasks the agent performs or because the tasks are inherently difficult to monitor. In either case, the owner may be unable to recognize when the agent is acting inappropriately. Additionally, the agent may act appropriately in the presence of the owner but act inappropriately when the owner's attention is diverted. This further confounds the owner's ability to monitor the agent's performance. A potential solution would be for the owner to insist that the manager offer a bond (i.e. collateral in the form of assets or capital) that would be forfeited in the event that the manager acts inappropriately. Because of informational asymmetry, even a bond may not prevent executives from engaging in self-interested actions since these individuals may be able to calculate the net return of a self-interested action, accounting for the loss of bond, and pursue only those actions that enhance welfare. Further, the manager could eliminate or doctor evidence of inappropriate actions. Doing so would create difficulty for the owners in proving inappropriate actions, thus preventing the payment of the bond.

Third, although a solution would be to create contracts that stipulate how the agent should act in all situations, the presence of bounded rationality (March & Simon, 1958; Simon, 1947) prevents this. Because the owners cannot foresee all contingencies that may occur, they cannot write a perfect contract. For this reason, contracts may not be effective in preventing managerial self-interest. The result is that the threat of managers pursuing self-interest is a persistent concern. As Jensen and Meckling (1976) note:

> The problem of inducing an 'agent' to behave as if he were maximizing the 'principal's' welfare is quite general. It exists in all organizations and in all cooperative efforts – at every level of management in firms, in universities, in mutual companies, in cooperatives, in governmental authorities and bureaus, in unions, and in relationships normally classified as agency relationships such as are common in the performing arts and the market for real estate (page 309).

Since monitoring, bonding, and contracts may not be effective, owners must find other mechanisms to prevent reduced welfare that results from self-interested executive actions. One method is to attempt to align the interests of the executive with those of the owners (Jensen & Meckling, 1976). This may be accomplished by linking the compensation of the executive (which maximizes the executive's welfare) directly to the value created for the owners (which maximizes the owner's welfare). Paying a greater proportion of the executive's compensation in long-term forms is viewed as the primary way to align the interests of executives and shareholders (Devers et al., 2007) because when the executive pursues self-interest to maximize compensation, the welfare of the owner is also maximized (Jensen & Murphy, 1990).

Research on whether long-term compensation helps to align the interests of executives with owners has produced equivocal results (Tosi, Werner, Katz, & Gomez-

Mejia, 2000). Mehran, Nogler and Schwartz (1998) found that incentive-based compensation was positively related to the voluntary enactment of liquidation policies that increased the value for owners, and similarly, Nagar, Nanda and Wysocki (2003) found that CEOs were more likely to disclose information voluntarily when paid in long-term forms. Conversely, some scholars have had opposite findings. One way that executives may act self-interestedly is to disclose inaccurate information in company reports. Both Burns and Kedia (2006) and O'Connor, Priem, Coombs and Gilley (2006) found a positive relationship between long-term compensation and inaccurate information disclosure, indicating that long-term compensation may not align incentives as theorized.

One reason for equivocal findings may be that the relationship between executive compensation and organizational outcomes is moderated by factors that have yet to be considered (Denis, 2001). Executive characteristics may be one such factor because individuals may differ in ways that affect how they respond to compensation (McLaughlin, 1991; Hambrick, 2007; Wowak & Hambrick, 2010). After reviewing the strategic change literature in the next section, hypotheses are developed that argue that executive age, tenure as CEO, and overconfidence affect the relationship between long-term compensation structure and strategic change. These hypotheses may offer some insight into why previous research has failed to find a consistent relationship between long-term compensation and organizational outcomes (Devers et al., 2007).

Two Aspects of Strategic Change

In this dissertation, strategic change is defined as alterations to an organization's pattern of resource deployments over time (Hofer & Schendel, 1978). This definition

encompasses various elements of strategic change in that an organization's pattern of resource deployments may be altered relative to prior organizational patterns (Amburgey & Dacin, 1994; Amburgey & Miner, 1992) or relative to the resource allocations of competitors (Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997). Both conceptualizations are consistent with the definition that strategic change is alterations to an organization's pattern of resource deployments. Despite this consistency, the two notions differ with respect to referent: one aspect assesses strategic change relative to prior organizational patterns while the other assesses strategic change relative to patterns in the organization's industry. To distinguish whether change occurred relative to prior organizational levels or relative to competitors, it is necessary to delineate between these "two important aspects of strategic change" (Carpenter, 2000: 1181).

The first aspect of strategic change is strategic variation. Strategic variation is the tendency of an organization to alter patterns of resource deployments relative to prior organizational patterns. Scholars have also utilized the term strategic persistence, or the "extent to which a firm's strategy remains fixed over time" (Finkelstein & Hambrick, 1990: 491) and strategic dynamism, or the "degree of change in an organization's strategy" (Chatterjee & Hambrick, 2007, p. 358). Regardless of terminology, all three compare the current resource allotments of the organization relative to prior levels. The difference is that variation and dynamism measure change while persistence measures a lack of change. For the purposes of this dissertation, the term strategic variation is used following the work of Carpenter (2000).

The focus of strategic variation is internal to the organization in that it measures changes in patterns of the organization's strategy but does not consider how the strategy

changed relative to competitors or the norms of the industry. Strategic variation addresses the question of "do organizations stick to what they have done previously or do they alter courses of action to better match current contingencies?" This aspect of strategic change provides evidence as to whether or not the organization remains committed to an organizational status quo (Boeker, 1997; Hambrick et al., 1993).

The second aspect of strategic change is strategic deviation. Strategic deviation is the change in the degree of conformity "of a firm's resource commitments from industry norms of competition" (Carpenter, 2000: 1182). Scholars have also labeled this strategic conformity (Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997), strategic similarity (Deephouse, 1999; Westphal, Seidel, & Stewart, 2001) and strategic homogeneity (Dooley, Fowler, & Miller, 1996; Miles, Snow, & Sharfman, 1993). Regardless of terminology, each assesses the strategy of the focal organization relative to industry norms. For the purposes of this dissertation, the term strategic deviation is used following the work of Carpenter (2000). Strategic deviation answers the question "do organizations stick to normative forms of competing or are they willing to attempt strategies that are new to their industry?" This aspect of strategic change provides evidence as to whether or not the organization remains committed to the status quo of the industry (Boeker, 1997; Hambrick et al., 1993).

The Value of Strategic Change to the Organization

In the preceding section, two aspects of strategic change were outlined, strategic variation and strategic deviation. Next, the question of "why organizations would initiate strategic change?" is addressed. Initiation of strategic change is seen by some as a fundamental component of strategic management (Porter, 1996; Prahalad & Hamel,

1990) because maintaining "the status quo is equivalent to competitive surrender" (Carpenter, 2000: 1179). In this view, altering strategies enables the organization to compete more favorably, thus creating a source of competitive advantage (Craig, 1996; Eisenhardt & Brown, 1998). Three explanations may help to clarify why strategic change enables favorable competition and the subsequent creation of a competitive advantage.

First, changing strategies allows organizations to differentiate themselves from competitors (Porter, 1980; White, 1986; Zajac & Shortell, 1989). By differentiating, organizations are more able to take advantage of opportunities provided by, among other things, innovating, entering new markets, and economies of scope (Porter, 1985). Second, changing strategies allows organizations to better match their strategy to their situation (Hofer & Schendel, 1978; Van de Ven & Poole, 1995). Since environmental circumstances can change, altering strategies either in anticipation of, or in response to, these changes is often necessary (Ginsberg & Buchholtz, 1990; Mintzberg, 1990). Organizations that successfully adapt to changing environmental conditions can enhance survivability (Baum & Singh, 1994; Hannan & Freeman, 1977), more fully leverage core competencies (Prahalad & Hamel, 1990) and profit from a series of short-term competitive advantages to create a sustainable competitive advantage (D'Aveni, 1994). Further, organizations may have unique bundles of resources and altering strategies may enable them to better leverage these resources (Barney, 1991). Third, as the dynamic view of strategy argues (e.g. Grant, 1996; Jacobson, 1992; Kirzner, 1979; Smith, Grimm, & Gannon, 1992), altering courses of action can create value by providing new opportunities (Jacobson, 1992; Schumpeter, 1942), gaining first-mover advantages

(Lieberman & Montgomery, 1998) and establishing competitive footholds relative to rivals (Smith, Grimm & Gannon 1992). Further, changing strategy can be a source of value by securing market share (Ferrier, Smith, & Grimm, 1999), avoiding escalation of rivalries (Gimeno & Woo, 1996) and limiting competitors' ability to counterattack (Miller & Chen, 1996).

Antecedents of Strategic Change

Given the viewpoint that strategic change can create value and be a source of competitive advantage, it is not surprising that a variety of antecedents to strategic change have been investigated (for a review, see Rajagopalan & Spreitzer, 1997). Boeker (1997) categorizes this literature on a continuum based upon whether the research adopts an inertial or adaptive view. Using this continuum as a guide, the next section provides a review of strategic change. Research adopting the inertial view is reviewed first, followed by investigations that adopt the adaptive view.

Inertial View of Strategic Change

The inertial view of strategic change places emphasis on the "powerful forces" that "operate at both the firm and industry levels to discourage strategic change" (Carpenter, 2000: 1179). Research that adopts this perspective investigates factors that limit the organization's ability to initiate strategic change (e.g. Boeker, 1989; Hannan & Freeman, 1984; Miller & Friesen, 1984). Along these lines, Porter (1980) argued that mobility barriers exist that prevent firms from changing strategies. Although firms may recognize that a strategic change is needed, because they lack scale economies or required capital, strategic change may not be possible. Similarly, the presence of switching costs and industry regulation may prohibit strategic change.

Beyond Porter's framework, the environment of the firm has also been related to strategic change. Much of this research has utilized institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). The institutional theory argument is that organizations face pressures to conform to industry norms because conformity enhances their ability to survive (Scott, 1987). Because of the pressure to conform, organizations are unlikely to deviate from industry norms of competition (DiMaggio & Powell, 1983). Some have questioned this argument, however (e.g. Delacroix, Swaminathan, & Solt, 1989; Zajac & Kraatz, 1993). Kraatz and Zajac (1996) argued that despite strong institutional pressures, colleges changed considerably from 1971 to 1986. Building on these findings, Deephouse (1999) discussed that firms must "be as different as legitimately possible" (page 147) and pursue a 'strategic balance' between deviation and similarity. That is, because firms benefit both by deviating from and conforming to industry norms, they must balance these benefits by changing strategies as much as possible while maintaining a connection to institutionalized practices. This argument was supported by Kennedy and Fiss (2009), who found that while firms benefit from remaining linked to institutional norms they also benefit from pursuing new practices that are aimed at improving efficiency and performance.

Other environmental factors that affect strategic change have been investigated as well, although findings have been equivocal (Rajagopalan & Spreitzer, 1997). For instance, both dynamism and munificence (Dess & Beard, 1984) have been linked to strategic change with confounding results. While Birnbaum (1984) and Wiersema and Bantel (1993) found a positive relationship between dynamism and strategic change, Fombrun and Ginsberg (1990) found a curvilinear relationship. Similarly, with

munificence, some researchers have found a positive relationship with strategic change (e.g. Ginsberg & Buchholtz, 1990; Wiersema & Bantel, 1993) while others found a negative relationship (e.g. Zajac & Kraatz, 1993) or even no relationship (e.g. Goodstein & Boeker, 1991). Further confounding the relationship between environment and strategic change, Birkinshaw, Morrison and Hulland (1995) found that while "structural determinants and competitive factors" in a firm's industry do affect strategic change, the strength of relationships "vary considerably from one industry to another" (page 637). Along these lines, Ansari, Fiss and Zajac (2010) offered a theoretical framework for investigating the technical, cultural and political aspects of an organization's environment and whether these elements affect how organizations adapt and change practices. Although these arguments have yet to be established empirically, they offer insight into the relationship between environmental factors and strategic change.

Research within the inertial perspective has also investigated the role that structure and prior strategy play in strategic change. Building on Chandler's (1962) argument that structure follows strategy, Frederickson and Iaquinto (1989) found that while strategy does determine structure, prior organizational structure creates a 'path dependent' process that affects strategic change. That is, because the organization has a certain structure that cannot be altered easily (Hannan & Freeman, 1977), the adoption of one structure limits the ability to pursue certain strategies in the future (Amburgey & Dacin, 1994). Prior strategies have also been linked to strategic change (e.g. Amburgey, Kelly, & Barnett, 1993; Grimm, Corsi, & Smith, 1993; Kelly & Amburgey, 1991; Smith & Grimm, 1987). Researchers have noted that firms that make large resource commitments toward one strategy may subsequently avoid changing that strategy

(Fombrun & Ginsberg, 1990). This is because making a large outlay of resources toward one strategy leads the firm to justify the initial expenditure by avoiding change (Staw, 1981).

Like the effects of structure and prior strategy on strategic change, researchers have noted the role that prior performance plays as well. Poor performance will elicit higher degrees of strategic change because the organization searches for new ways to meet aspiration levels while favorable performance will be an indicator that the firm may not need to change (Cyert & March, 1963; March & Simon, 1958). Researchers have provided support for this contention, including Boeker (1989), Zajac and Kraatz (1993), Carpenter (2000) and Zhang (2006), each of which found a negative relationship between performance and strategic change. Similarly, in a study of Finish grocery stores, Lamberg and colleagues (2009) found that firms that were performing well did not change strategies and Deephouse (1999) found that positive prior performance was negatively related to strategic change. A potential confound in the relationship of organizational performance and strategic change is the amount of slack resources available to the firm (Pfeffer, 1978). While organizations may want to initiate change in response to poor performance, if the organization does not have unabsorbed slack, or uncommitted liquid resources (Singh, 1986), it may be unable to do so (Staw, Sandelands, & Dutton, 1981).

Adaptive View of Strategic Change

In contrast to the inertial view, the adaptive view of strategic change places emphasis on organizations proactively changing strategies (e.g. Eisenhardt & Brown, 1998; Porter, 1996). In this view, strategic change is initiated to match the strategy with

the unique contingencies of the organization such as resource endowments and the external environment (e.g. Andrews, 1971; Child, 1972; Hofer & Schendel, 1978; Rumelt, 1974). Adaptive view researchers have analyzed a number of organizational characteristics that affect strategic change, including firm age and size. Arguments connecting strategic change with firm size and age stem from research on the nature of organizational growth and development (e.g. Chandler, 1962; Stinchcombe, 1965). While some research has found that firm size was positively related to strategic change (e.g. Zajac & Kraatz, 1993; Zajac et al., 2000), others have found that it was negatively related to strategic change (e.g. Carpenter, 2000; Kelly & Amburgey, 1991; Sanders, 2001; Zhang, 2006). Similarly, while Boeker (1989) found that firm age increased the likelihood of strategic change, Kelly and Amburgey (1991) found that firm age decreased the likelihood of strategic change. Zajac and Kraatz (1993) offered an explanation for these findings, noting that the strategic change was dependent upon whether the firm needed to change or not, and not just upon size and age.

Scholars have argued that organizations are reliant upon the board of directors for strategic change decisions because the board of directors is responsible for overseeing the performance of executives (e.g. Johnson, Hoskisson, & Hitt, 1993; McNulty & Pettigrew, 1999; Westphal, 1999; Westphal & Fredrickson, 2001). As such, characteristics of the board of directors have been related to strategic change as well. Hill and Snell (1988) found that board power was negatively related to the pursuit of change, although Golden and Zajac (2001) found that board power was positively related to strategic change, a finding consistent with Goodstein and Boeker's (1991) results. Galaskiewicz and Wasserman (1989) argued that the board of direction serves as a source of information

for the organization. Because directors have different sources of information, the composition of the board may be a determinant of organizational outcomes (Shropshire, 2010). Researchers have investigated this possibility by analyzing a variety of board member characteristics (e.g. Carpenter, Pollock, & Leary, 2003; Goodstein & Boeker, 1991; Goodstein, Gautam, & Boeker, 1994; Kor & Misangyi, 2008) including the structure of their social networks (Westphal, 1999; Westphal & Milton, 2000). Westphal and Fredrickson (2001) found that board members experience on other boards was positive related to the strategic change while both Carpenter (2000) and Sanders (2001) found that a higher proportion of outsiders on the board related positively to strategic change. In contrast, Zhang (2006) found no relationship between outside director percentage and strategic change, but did find a negative relationship between board size and strategic change; a finding that confirmed Goodstein and colleagues (1994) earlier work.

Beyond the role of the board of directors, adaptive view researchers have also investigated the role that an organization's executives play in strategic change. Executives hold a prominent position in the adaptive view because "only executive leadership has the position and potential to initiate and implement strategic change" (Tushman & Romanelli, 1985: 209). In particular, both age and tenure have been investigated because these traits are associated with executive rigidity (Katz, 1982), or a predisposition towards established practices (Boeker, 1997). Executive rigidity may exist for two reasons. First, cognitive biases may prevent executives from changing because the routines they established become entrenched over time. Executives do not want to disrupt established practices or information processing procedures, and therefore, they

avoid change (Miller & Friesen, 1984). Second, executives may lack motivation to change. Miller (1991) argued that as executives age and/or remain in their positions for longer durations, they become "stale in the saddle" (page 34). In turn, they continue with familiar courses of action because they grow complacent with the status quo and lack motivation to change. Research findings have provided support for these two contentions, including both Grimm and Smith (1991) and Wiersema and Bantel (1992), who found that executive age and tenure were negatively related to strategic change. Similarly, Finkelstein and Hambrick (1990) as well as Boeker (1997) also found a negative relationship between strategic change and executive tenure.

Beyond age and tenure, other demographic variables have been linked to strategic change as well. Geletkanycz and Hambrick (1997) argued that because executives gained valuable information through their social network ties, these relationships may influence the propensity to initiate strategic change. They found that the extra-industry network ties of executives were positively related to strategic change because these ties served as sources of new information. In contrast, intra-industry network ties were negatively related to strategic change because these relationships created social pressures to conform to industry norms. Wiersema and Bantel (1992) found that executive education level had a positive relationship with strategic change and Zhang (2006) argued that the presence of a COO will affect strategic change initiatives, but that this relationship is dependent upon prior performance. Findings suggest that the presence of a COO is positively related to strategic change when performance is low but that this relationship is the opposite when performance is high. One possible explanation for this is that like the board of directors, the COO acts as a 'check and balance' to the CEO to

either initiate or limit strategic change depending on whether or not prior performance warrants the action.

While scholars have relied heavily on demographic variables (Hambrick, 2007; Lawrence, 1997), some research has assessed the relationship between executive psychological traits and strategic change. Three studies have linked executive locus of control with strategic change initiatives. Miller and Toulouse (1986) found that executives with a more internal locus of control were more likely to adapt strategies to the environment. Similarly, Govindarajan (1989) found that executives with a more internal locus of control were associated with higher degrees of strategic differentiation, results that were confirmed by Boone and colleagues (Boone, de Brabander, & van Witteloostuijn, 1996). More recently, Chatterjee and Hambrick (2007) found that narcissistic CEOs were more likely to change strategies while Delgado-Garcia and de la Fuente-Sabate (2010) found that affective traits of CEOs impact the strategic change initiatives of their organizations. Additionally, Hmieleski and Baron (2008) found that the regulatory foci (Higgins, 1997) of small business executives significantly related to deviation from intended strategies. Those individuals with a prevention focus were negatively related to deviation from intended strategies while promotion focused executives were positively related to deviation from intended strategies.

One psychological construct that has yet to be related to strategic change is overconfidence. Overconfidence is a cognitive bias that affects how individuals respond to the situations that they face (Busenitz & Barney, 1997). This bias is robust across situations (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995) and can persist in individuals for long periods of time regardless of previous outcomes (Kyle & Wang,

1997). That is, overconfident individuals continue to exaggerate "their abilities and chances for success" (Hiller & Hambrick, 2005: 302) even when prior performance or current conditions do not warrant it. As a case in point, despite introducing products that "were less likely to achieve success," overconfident managers expressed "extreme certainty about achieving success" (Simon & Houghton, 2003: 139).

Because overconfident executives exaggerate their ability to exact value-creating changes (Malmendier & Tate, 2005), they may be more likely to initiate strategic change as well. While researchers have yet to investigate this relationship, similar studies provide support for this contention. Researchers have found that overconfident executives are more likely to take risks (Li & Tang, 2010), make acquisitions (Roll, 1986) and undertake value-destroying mergers (Malmendier & Tate, 2008) in part because these individuals believe that their actions would result in positive gains for their firm (Hayward & Hambrick, 1997).

Summary of the Literature Review

The purpose of this dissertation is to gain a greater understanding of the role that executives play in strategic change. To this end, a review was provided of the two most utilized theoretical viewpoints for analyzing the role of executives in organizational outcomes: upper echelons and agency theories (Cannella & Monroe, 1997; Hambrick, 2007; Jensen & Zajac, 2004). Upper echelons theory emphasizes the effects of executive's individual-based differences (for reviews, see Carpenter et al., 2004; Finkelstein et al., 2009) while agency theory emphasizes their situational-based differences (for reviews, see Denis, 2001; Devers et al., 2007; Gomez-Mejia & Wiseman, 1997). Accordingly, upper echelons research has related executive demographic and

personality traits to strategic change while agency theory has related the compensation situation under which executives work to strategic change.

Three elements of strategic change were also reviewed. First, two aspects of strategic change were discussed to more clearly delineate how the firm changed. Strategic variation refers to change relative to prior organizational strategies while strategic deviation refers to change relative to the strategies employed in the organizations' industry. Second, the merits of changing strategies were discussed. Strategic change can be valuable to organizations because it allows them to compete on more favorable terms, which in turn can be a source of competitive advantage (Eisenhardt & Brown, 1998; Craig, 1996). Third, the antecedents of strategic change were reviewed. This review was organized according to whether the research adopted an 'inertial' or 'adaptive' view (Boeker, 1997). Although changing strategies may be beneficial, it may be difficult for an organization to do so because firms are often 'inert' (Hannan & Freeman, 1984), or resistant to change. However, because strategic change can be a source of competitive advantage, organizations often purposefully change or 'adapt' their strategies in an attempt to gain this competitive advantage (Porter, 1996).

A problem that was highlighted in the review of strategic change is the presence of contradictory findings across a number of variables, an issue caused in part by researchers failing to incorporate the insights from multiple perspectives (Rajagopalan & Spreitzer, 1997). Scholars have recently argued that combining the insights of various perspectives is needed to advance our knowledge of strategic change (e.g. Fiss & Zajac, 2006; Zajac et al., 2000; Zhang & Rajagopalan, 2004). Combining the insights of upper echelons and agencies theories has been advocated in this dissertation. This approach

may be apt for three reasons. First, the perspectives share theoretical commonality in that both investigate the role of executives in organizational outcomes. Second, although both upper echelons and agency perspectives have been utilized to investigate strategic change in isolation, they have yet to be used in concert. Doing so may advance our knowledge of the role that executives play in initiating change. Third, research relating executive compensation to organizational outcomes has produced contradictory results. This suggests that while "pay does influence executive action," the relationship may not be "in the simplistic manner prescribed" (Devers et al., 2007: 1032). One reason for these contradictory findings may be the existence of unidentified moderators to the relationship between executive compensation and organizational outcomes (Denis, 2001). A possible moderator may be executive characteristics because individual differences may affect how people respond to the compensation inducements they are presented (McLaughlin, 1991; Hambrick, 2007; Wowak & Hambrick, 2010). As such, in the next section hypotheses are developed that argue that executive age, tenure as CEO, and overconfidence moderate the relationship between long-term compensation structure and strategic change.

HYPOTHESES

In this section, hypotheses are developed that argue that the relationship between executive compensation and strategic change is moderated by executive characteristics. Although it is also possible that this relationship could be reversed (i.e. that compensation situations would moderate the relationship between executive characteristics and strategic

change), the presence of contradictory findings between compensation and organizational outcomes suggests that this relationship is being affected by contextual considerations (Devers et al., 2007; Denis, 2001). In contrast, the relationship between executive characteristics and strategic change has produced more consistent findings across a range of studies (Rajagopalan & Spreitzer, 1997), which suggests that the relationship is robust to situational differences such as executive compensation. For these reasons, executive characteristics are hypothesized to moderate the relationship between long-term compensation structure and strategic change, and not vice versa.

The hypotheses are developed as follows. First, a direct relationship is hypothesized between the long-term structure of an executive's compensation and strategic change. Next, three executive characteristics are argued to affect the strength of this relationship: age, tenure and overconfidence.

Executive Long-term Compensation Structure and Strategic Change

Prior studies have noted that executives often avoid engaging in strategic change (e.g. Finkelstein & Hambrick, 1990; Holmstrom, 1982; Scharfstein & Stein, 1990; Staw, 1976). The reluctance of executives to change strategies is problematic for the owners of the firm because strategic change can be a source of value for the organization (Eisenhardt & Brown, 1998; Craig, 1996). When executives fail to pursue this value, the owners may suffer reduced welfare. To avoid the reduction of welfare, owners of an organization must find methods to induce executives to engage in strategic change. One way to persuade executive action is to align their interests with those of the owners (Jensen & Meckling, 1976). Agency theory argues that aligning the interests of the executive with those of the owners can be accomplished by providing incentives to the

executive to pursue the interests of the owners. These incentives can be provided by the structure of the executive's compensation, because, as Jensen and Murphy (1990) note, "compensation policy that ties the CEO's welfare to shareholder wealth helps align the" interests of the two parties and "thus provides incentives for CEOs to take appropriate actions" (page 226).

The compensation policy believed to best align the interests of the executive with those of the owners is long-term compensation. Long-term compensation helps align the incentives of the executive with those of the shareholder by paying the executive based upon the amount of value they have created for the owners (Jensen & Murphy, 1990). That is, when shareholder value is increased, the compensation of the executive is likewise increased (Baysinger & Hoskisson, 1990). Hence, long-term compensation provides incentives for executives to "focus their actions on long-term concerns" of the organization "like ongoing strategic change and adaptation" (Carpenter, 2000: 1184).

Hypothesis 1: There will be a positive relationship between CEO long-term compensation structure and strategic change.

The Moderating Role of Executive Characteristics

Some scholars have questioned whether long-term compensation induces managers to act as previously theorized (e.g. Hanlon, Rajgopal, & Shevlin, 2003; Jensen, Murphy, & Wruck, 2004). As Sanders (2001) notes, while long-term compensation may provide executives with incentives to act, various factors "could conceivably obscure the incentive effects" that long-term compensation offers (page 480). One factor that may obscure, or alternately enhance, the incentive effects of long-term compensation is the characteristics of the executive. That is, "executives might differ in their reactions to incentive arrangements" because individual "differences exist and are consequential" to

how executives respond to the situations that they face (Hambrick, 2007: 340). As Hambrick notes, a 45-year-old executive may respond differently than a 65-year-old executive when faced with aggressive long-term incentive plans and similarly, executives from different socioeconomic backgrounds may respond differently when faced with the prospects of wealth. Therefore, investigating the role that executive characteristic play in moderating the incentive effects of long-term compensation may be of promise.

Executive Age and Tenure

With regard to the relationship between long-term compensation and strategic change, executive age and tenure are important factors for two reasons. First, the outcome of strategic change is uncertain, as it is not possible to determine beforehand what impact strategic change will have on the performance of the firm. Outcome uncertainty increases executive risk because it threatens both job security and wealth (Wiseman & Gomez-Mejia, 1998; Zwiebel, 1995). The increased level of risk provides executives with disincentives to engage in long-term initiatives (Henderson & Fredrickson, 1996) such as strategic change. This is particularly true for older executives, because the downside risks are increased disproportionately for these individuals since they have fewer years to recoup financial losses (Eaton & Rosen, 1983) and may have difficulty securing future employment (Ocasio, 1994). Because of the higher downside risks, older executives may be less inclined than younger executives to respond to long-term compensation by engaging in strategic change.

Second, implementing a strategic change requires executives to expend additional personal resources (i.e. time and energy) that they would not have to expend if they avoid strategic change (Boeker, 1989; Holmstrom, 1982). Executives that are older and longer-

tenured are less inclined to expend personal resources in this fashion (Miller, 1991). As a result of the inclination against expending personal resources, older executives may be less likely to respond to the incentives that long-term compensation provides to initiate strategic change. Cumulatively, because older and more tenured executives have both (a) higher downside risks associated with strategic change and (b) a predisposition against expending additional personal resources required to initiate change, these individuals may be less likely to respond to the incentives provided by long-term compensation with changing strategies. Thus, executive age and tenure weaken the relationship between long-term compensation and strategic change.

Hypothesis 2: CEO age will moderate the relationship between long-term compensation structure and strategic change such that as CEO age increases, the relationship between long-term compensation structure and strategic change is weakened.

Hypothesis 3: CEO tenure will moderate the relationship between long-term compensation structure and strategic change such that as CEO tenure increases, the relationship between long-term compensation structure and strategic change is weakened.

Executive Overconfidence

Because overconfidence affects how individuals respond to the situations that they face (Busenitz & Barney, 1997), it may also be an important factor to consider in the context of executive compensation. Overconfident individuals believe that their actions will result in successful outcomes (Malmendier & Tate, 2005). Consequently, the incentive-effects of long-term compensation may be stronger for overconfident executives because these individuals are certain that their actions will result in favorable performance for their organization, which in turn will lead to higher compensation. That is, because they are assured that outcomes will be favorable, overconfident executives will respond to long-term compensation more positively than their less confident

counterparts. This is because the overconfident executive has little doubts about their ability to secure the outcome-based rewards that long-term compensation offers. The relationship between long-term compensation and strategic change, then, will be stronger for overconfident executives because overconfident executives are positive that their initiation of strategic change will increase performance for the organization, which in turn will increase their compensation.

Hypothesis 4: CEO overconfidence will moderate the relationship between long-term compensation and strategic change such that as CEO overconfidence increases, the relationship between long-term compensation structure and strategic change is strengthened.

SUMMARY

In the preceding chapter, a literature review was provided that expanded upon the research model provided in Chapter I. This review included upper echelons and agency theories as well as three aspects of strategic change. These three aspects covered what strategic change is, the value of strategic change to the organization, and antecedents of strategic change. Subsequently, hypotheses were developed that combined elements from upper echelons and agency theories as they relate to strategic change, arguing that executive characteristics moderate the relationship between executive long-term compensation and strategic change. Figure 2 depicts the hypothesized relationships, which are also listed in Table 1.

FIGURE 2

Hypothesized Model of the Moderating Effects of CEO Characteristics on the Relationship between CEO Long-term Compensation Structure and Strategic Change

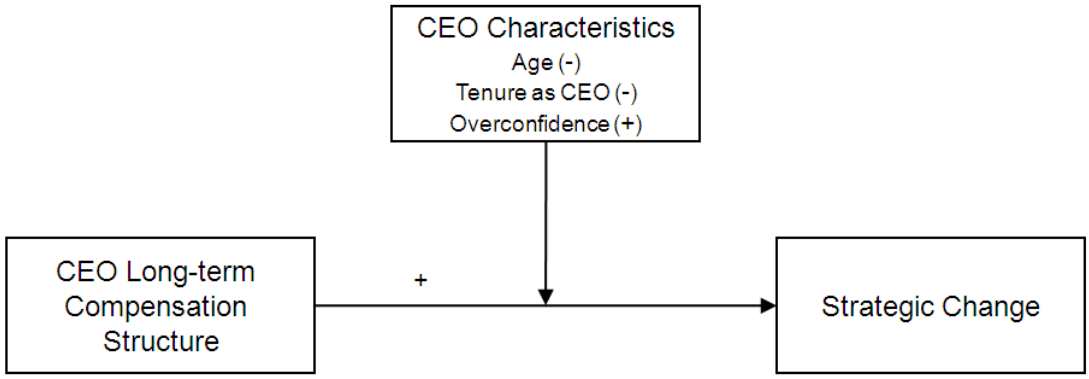


Table 1

Hypotheses of the Moderating Effects of CEO Characteristics on the Relationship between CEO Long-term Compensation Structure and Strategic Change

Hypothesis 1 (positive)	There will be a positive relationship between CEO long-term compensation structure and strategic change.
Hypothesis 2 (negative)	CEO age will moderate the relationship between long-term compensation structure and strategic change such that as CEO age increases, the relationship between long-term compensation structure and strategic change is weakened.
Hypothesis 3 (negative)	CEO tenure will moderate the relationship between long-term compensation structure and strategic change such that as CEO tenure increases, the relationship between long-term compensation structure and strategic change is weakened.
Hypothesis 4 (positive)	CEO overconfidence will moderate the relationship between long-term compensation and strategic change such that as CEO overconfidence increases, the relationship between long-term compensation structure and strategic change is strengthened.

CHAPTER III

METHODOLOGY

This chapter discusses the methodology employed to test the hypotheses that were developed in Chapter II. Explanations are provided regarding the sample, the analytical techniques to be employed, and measures of the constructs.

Sample

Because private corporations are not required to disclose compensation information, a sample of publicly traded firms operating in the United States from the years 1996 to 2006 was selected. The year 1996 was chosen as a starting point for data collection to avoid discrepancies in the reporting of industry data that have been documented in years prior to 1996 (e.g. Guenther & Rosman, 1994; Kahle & Walkling, 1996). The year 2006 was chosen as an end point to avoid confounds associated with the global economic crisis that began in 2007. The sample was further trimmed in four ways. First, firms operating in highly regulated industries (e.g. life insurance companies, financial institutions, professional sports organizations, utilities, governmentally owned corporations) were omitted because these firms may not be able to change strategies without governmental oversight (e.g. McGahan & Porter, 1997; Sanders, 2001). Second, firms operating in industries with fewer than three competitors were omitted because it

is not possible to distinguish the effect that industry membership may have in these industries (McGahan & Porter, 1997). Third, firms were omitted if their CEO held a temporary (e.g. Interim CEO, Acting CEO) or joint (e.g. co-CEO) appointment because the effect of these individuals on organizational outcomes may be different than a single, permanently appointed CEO (e.g. Ballinger & Marcel, 2010). Fourth, to guard against the possibility that a firm was set up for the disposition of assets and does not have a strategy from which it can change, firms that reported less than four years of data in the period studied or with less than $100 million in sales and assets were omitted (e.g. McGahan & Porter, 1997; McNamara, Vaaler & Aime, 2005).

No single data set exists that has all of the variables necessary for testing the hypothesized relationships while including appropriate control variables. As such, data was gathered from a variety of sources. Accounting statement data was gathered from the COMPUSTAT database and information on CEO compensation was gathered from COMPUSTAT's Execucomp database. Data on other executive and board of director characteristics was gathered from a various sources, including company 10-K statements, other databases such as Mergent and Compact Disclosure as well as *The Dun & Bradstreet Reference Book of Corporate Management*.

Analytical Technique

This data set has several characteristics that have led to the selection of the Arellano-Bond method (Arellano & Bond, 1991) to test the hypothesized relationships. The Arellano-Bond is "a statistical technique designed for analyzing autoregressive-distributed lag models from panels with many cross-sectional units observed for relatively few time periods via General Method of Moments (GMM) estimates" (David,

Yoshikawa, Chari, & Rasheed, 2006: 596). This technique creates a model based upon a system of equations that includes one equation per time period. The equations are different only in that the moments and instrumental variables are unique to each time period equation.

The Arellano-Bond method has four characteristics that make it a good choice for testing the hypothesized relationships. First, it controls for prior values of the dependent variables (i.e. it can control for values in time *t* when assessing a dependent variable in time $t + 1$ or can control for values in time $t - 1$ when assessing a dependent variable in time *t*). This is important because strategic change is likely influenced in part by prior levels of strategic change. Second, this method accounts for firm-specific fixed effects by subtracting the lagged values of regressors. This practice is referred to as 'first-differencing' and is advantageous because it removes unobserved latent heterogeneity from the model that may bias estimates if unaccounted for (Greene, 2008). Firm-specific heterogeneity may exist in this sample because firms may differ over time in a consistent manner that is unobserved. If the unobserved variables affect the dependent variable and are fixed over time, the parameter estimates may be biased. To avoid biased estimates, it is necessary to account for these fixed effects. Third, endogeneity may pose a problem because it is possible that long-term pay is at least partially driven by prior patterns of strategic change. The "conventional way to deal with endogeneity is to include an instrumental variable" of the variable of interest (Hambrick, 2007: 338). The Arellano-Bond method does just this by "using lagged values of the regressors as instruments of the first-differenced regressors" (David et al., 2006: 596). Fourth, improved estimates are

provided by GMM in the presence of heteroskedasticity and autocorrelation that plague dynamic models (Greene, 2008).

To ensure that this method is appropriate, two tests need to be conducted. First, a Sargan/Hansen test checks for overidentification, which helps ensure the validity of the instrumental variables by testing whether they are uncorrelated with the residuals (Roodman, 2006). Second, the Wald test checks for nested model comparisons by examining the significance of restrictions to a model in which the parameters are unrestricted (Greene, 2008).

Temporal Measurement of Variables

Prior to discussing the measures of the variables, it is important to note the time frames over which the variables were calculated. All independent and control variables were measured in the focal time period *t* unless otherwise noted. Dependent variables were calculated going forward (e.g. using $t + 1$). This is equivalent to creating a lag variable for all independent variables (e.g. using $t - 1$) and assessing the dependent variable in time *t*, although rather than lagging all predictors, by calculating the 'lag' going forward, only the dependent variables are changed (Carpenter, 2000).

When assessing relationships over time it can be difficult to know a priori the appropriate length of time to utilize (Sanders, 2001). With regard to the hypothesized model, "CEO compensation should explain near-term changes in strategy, while controlling for alternative explanatory variables" (Carpenter, 2000: 1187). However, there is no agreed upon time interval that constitutes 'near-term' when investigating relationships with strategic change. Finkelstein and Hambrick (1990) employed a pooled value of strategic change calculated over a five-year time, as did Zhang and Rajagopalan

(2003). However, several prior studies have measured strategic change over three-year time periods (e.g. Boeker, 1997; Geletkanycz & Hambrick, 1997; Greve, 1998; Haveman, 1993; Westphal et al., 2001; Wiersema & Bantel, 1992) while other scholars have utilized a one-year time frame (e.g. Chatterjee & Hambrick, 2007; Zajac et al., 2000; Zhang, 2006). Because there is not an agreed upon time interval for evaluating strategic change, multiple time frames were employed for this dissertation and results are compared to assess sensitivity across time intervals. A one-year time frame (i.e. $t + 1$) was employed as well as a three-year time frame (i.e. $t + 3$).

Measures

Dependent Variables. As Finkelstein and Hambrick (1990) note, "the most appropriate way to assess" the strategic change "is to examine actions on multiple fronts" (page 492). Following this logic, strategic change was assessed using a composite measure. Two composite measures were created, one to assess strategic variation and a second to assess strategic deviation. The measure consisted of the following six indicators:

1. advertising intensity (advertising/total sales)
2. research and development (R&D) intensity (R&D/total sales)
3. plant and equipment (P&E) upgrades (net P&E/gross P&E)
4. non-production overhead (selling, general and administrative expense / sales)
5. inventory levels (inventory/total sales)
6. financial leverage (debt/equity)

These indicators were used by Finkelstein and Hambrick (1990) and have also been employed by other researchers to assess strategic change (e.g. Datta, Rajagopalan, & Zhang, 2003; Geletkanycz & Hambrick, 1997; Zhang & Rajagopalan, 2003, 2004). The indicators were chosen because they have been utilized extensively in strategy research and because:

> (a) they are potentially controllable by managers; (b) they may have an important effect on firm performance; (c) they are complementary, each focusing on an important but specific aspect of a firm's strategic profile; and (d) they are amenable to data collection and have relatively reliable comparability across firms within an industry (Finkelstein & Hambrick, 1990: 491).

Strategic variation measures the extent to which a firm's strategy changes over time relative to prior firm strategies. The strategic variation measure was calculated following a three-step process (e.g. Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997). First, for each of the six indicators, an absolute value of change is calculated between year *t* and the focal year (i.e. *t* +1 or *t* + 3). When using a one-year value, the difference is calculated between *t* and *t* + 1, which indicates change on this indicator over a single year. When using the three-year value of strategic change, the change in each indicator is calculated by subtracting the value in *t* from the value in *t* + 3. Second, the values are standardized to have a mean of zero and a standard deviation of one. Third, the standardized values of the six indicators are summed to form an index of strategic variation. A higher index value represents a higher degree of strategic variation. The two strategic variation measures are referred to as 'One-Year Strategic Variation,' which is strategic variation using time *t* + 1, and 'Three-Year Strategic Variation,' which is strategic variation using time *t* + 3.

Strategic deviation measures the degree to which a firm's strategy deviates from the norms of their industry. Industry was assessed using the firm's primary 4-digit SIC code. Although some scholars have utilized 2-digit SIC codes (e.g. Westphal et al., 2001), 4-digit SIC codes were chosen for this dissertation for two reasons. First, 2-digit SIC codes classify firms in a very broad fashion which distorts industry effects (McGahan & Porter, 1997) and is problematic when identifying competitors (Fan &

Lang, 2000). As a case in point, 2-digit SIC codes would indicate that plastic packaging manufacturers (e.g. bubble-wrap, shrink-wrap, plastic containers) would be compared to pulp mills and similarly, that prescription drug companies would be compared to industrial fertilizer manufacturers, even though these industries have little, if any, competitive overlap (Fan & Lang, 2000). Second, the 4-digit SIC is more commonly employed in the strategic change literature (e.g. Carpenter, 2000; Chatterjee & Hambrick; 2007; Hambrick & Finkelstein, 1990; Zhang, 2006; Zhang & Rajagopalan, 2009) which facilitates comparing the results of this dissertation to other studies. Following this logic, 4-digit SIC codes were used throughout this dissertation to identify the firm's primary industry.

The measure of strategic deviation utilizes the same six indicators as strategic variation and is calculated following a five-step process (e.g. Chatterjee & Hambrick, 2007; Finkelstein & Hambrick, 1990). First, each of the six indicators is calculated in the focal time period (i.e. t +1 or t + 3) for both the firm and the firm's primary industry. When using a single-year value, the value for year t + 1 is used. When using the three-year value of strategic change, the value is calculated for time period t + 3. Second, the value of each indicator for the firm's industry is subtracted from the firm value for each indicator. Third, the absolute value of the differences calculated in step two is taken. Fourth, this value is standardized to have a mean of zero and a standard deviation of one. Fifth, the six values from step four are summed to create a strategic deviation index for each firm. A higher index value indicates a higher level of deviation from industry norms. The two strategic deviation measures are referred to as 'One-Year Strategic

Deviation,' which is strategic deviation using time $t + 1$, and 'Three-Year Strategic Deviation,' which is strategic deviation using time $t + 3$.

Independent variables. *Long-term Compensation Structure (LTCS)* is measured as the percentage of total CEO compensation paid in long-term forms (Carpenter, 2000). Long-term forms of compensation include restricted stock grants, option grants, and long-term incentive plan (LTIP) payouts. *Age* is calculated as the age of the CEO in years during the focal year. *Tenure* is calculated as the number of years the individual has been the CEO of the focal organization.

Because there are limitations with unobtrusive measures of overconfidence (Hiller & Hambrick, 2005), the construct was assessed two ways and results compared across measures. One method of measuring overconfidence utilizes the exercise of executive stock options (Malmendier & Tate, 2005; 2008). Stock options are a form of long-term compensation that provides the executive with the right to purchase company stock in the future at a pre-specified price. The pre-specified price is referred to as the grant price. "Most executive options have a ten-year life span and are fully exercisable after a four-year vesting period," meaning that executives must hold the option for four years before it can be exercised and they must exercise it within six years after the option becomes exercisable (Malmendier & Tate, 2008: 24). Options are non-tradable and cannot be short-sold. As a result, options are almost always exercised immediately once they are vested (as long as they have a positive or 'in-the-money' value) because holding the exercisable options increases the executive's risk (Ofek & Yermack, 2000). As Malmendier and Tate (2008) argue, "one interpretation of failure to exercise is overconfidence," because it implies that that the executive overestimates the value of the

"firm's future returns" (page 24). That is, executives hold onto the options to extract a higher value in the future because they are overconfident in their ability to drive the stock value higher. In a recent field study, Hodge, Rajgopal and Shevlin (2009) provided support for this argument, noting that executives tend to overvalue stock options in part because they are "overly optimistic about the future prospects of their firms" (page 926). Following this logic, the current estimated value of each CEO's exercisable stock-options that are unexercised was used to measure overconfidence. This variable is denoted as *Option-based Overconfidence*. Larger values indicate higher degrees of overconfidence.

A second method of measuring overconfidence utilizes executives' purchase and sale of company stock. Despite the fact that doing so increases their "already high exposure to company risk," executives may choose to purchase additional shares of company stock beyond what they receive in compensation (Malmendier & Tate, 2005: 2672). Because purchasing additional shares accentuates the risk of the executive (Ofek & Yermack, 2000), this action may serve as a proxy of overconfidence in that additional investment in their own company is a signal that the executive is confident in the future of the company. Alternatively, executives may sell off current stock if they are not confident in the future prospects of the firm. The net change in an executive's stock ownership, excluding stock options and grants, was utilized as a measure of *Stock-based Overconfidence.* Larger values reflect higher levels of confidence.

Moderating variables. Three interaction terms were created to assess the moderating role of age, tenure, and overconfidence on the relationship between long-term compensation and strategic change. While scholars have suggested centering variables involved in interaction terms (Aiken & West, 1991), the necessity of this practice in

econometric models has been questioned (Arellano, 2003; Greene, 2008). As such, interactions were created by multiplying independent variables together without centering. The result was three moderating variables: *LTCS X Age, LTCS X Tenure, and LTCS X Overconfidence.*

Control Variables. A variety of factors have been shown to affect strategic change. It is important that these variables be controlled for to guard against the possibility that strategic change is being driven by these factors and not by the hypothesized relationship. Because the industry in which an organization operates may affect its ability to change strategies (Porter, 1980), controlling for industry membership is necessary. *Industry* is created using the 4-digit SIC code of each firm's primary industry. It has been argued that firm size directly affects strategic change (Mintzberg, 1978). *Size* was calculated as the natural log of total assets and included in the model. The availability of unabsorbed slack, or resources that are liquid but are not currently committed within the organization, enhances the organization's ability to initiate actions (Singh, 1986; Staw et al., 1981) such as strategic change (e.g. Chatterjee & Hambrick, 2007). This is because the organization can more easily allocate uncommitted liquid resources since they do not have to make alterations in one area to have resources available for another. Rather, having unabsorbed slack allows the organization to allocate uncommitted liquid resources to another project without having to reallocate resources from another area which can be difficult and costly (Singh, 1986). As such, unabsorbed slack facilitates the implementation of strategic change (Chatterjee & Hambrick, 2007), it is important to include it as a control variable. *Unabsorbed slack* was calculated as the current assets divided by current liabilities and included as a control

variable. This ratio, also known as the current ratio, represents those resources within the organization that are liquid but are not absorbed by other projects (Singh, 1986).

Wiersema and Bantel (1993) argued that prior levels of strategic change and performance are important determinants of strategic change. That is, that strategic change in certain time period (e.g. time $t + 1$) is driven in part by strategic change in prior time period (e.g. time t). The Arellano-Bond method is amenable to controlling for prior values of the dependent variable (Arellano, 2003) and so *Prior Strategic Change* was included as a control. Consistent with the treatment of the dependent variables, prior strategic change is referred to as *Prior One-Year Strategic Variation, Prior Three-Year Strategic Variation, Prior One-Year Strategic Deviation* and *Prior Three-Year Strategic Deviation*, respectively.

Prior firm performance was included as a control as well because firms that are performing well are less likely to initiate strategic change (Wiersema & Bantel, 1993). Because of limitations in utilizing any one measure of firm performance (Venkatraman & Grant, 1986; Venkatraman & Ramanujam, 1986), researchers (e.g. Finkelstein & Boyd, 1998; Fiss & Zajac, 2006; Sanders & Carpenter, 1998) often employ both accounting-based (e.g. ROA, ROI, ROE) and market-based measures of performance (e.g. Tobin's q, total shareholder returns, market share). This practice is beneficial because it provides evidence that the relationships are not sensitive to the measure of firm performance which helps enhance the robustness of the findings (Wright, Kroll, Lado, & Elenkov, 2005). Because of these benefits, the hypothesized relationships were tested using three different measures of prior firm performance and results are compared across measures. Two accounting-based measures and one market-based measure were utilized.

The first accounting-based measure that was employed is return on assets (*ROA*). ROA was selected because it "indicates the efficiency with which a firm employs its current asset base" (Carpenter et al., 2001: 500). This is pertinent to the study of strategic change because if the organization is not currently employing assets efficiently, it may be more likely to change strategies. An additional benefit of utilizing ROA is that "its frequent use in other studies" facilitates "comparing results across studies" (Sanders, 2001: 483).

One problem with utilizing ROA is that differences exist across industries (Hrebiniak & Snow, 1980; Porter, 1980) that limit comparability of accounting-based measures (Dess & Beard, 1984). To guard against this possibility, it may be necessary to adjust these measures to account for industry variation (Datta & Rajagopalan, 1998). One method of accounting for industry variation is utilizing *Industry Adjusted ROA*. This measure is calculated by taking the difference between the firm's ROA and the median ROA from the firm's primary industry (e.g. Finkelstein & Hambrick, 1990; Zhang, 2006). Adjusting ROA to the industry median is preferable to mean-adjustments (e.g. mean difference, z-scores) for two reasons. First, because panel data often exhibits non-normality (i.e. skewness, multi-modality or kurtosis), adjusting by the mean may bias estimates since mean values do not adequately capture the distribution of non-normal data (Greene, 2008). Second, using the median value facilitates comparison to the strategic change literature that commonly utilizes median adjusted measures (e.g. Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997; Zhang, 2006; Zhang & Rajagopalan, 2009).

The third measure of firm performance that was utilized is the market-based measure of Total Shareholder Returns (*TSR)*. TSR is calculated as the percentage change in stock price plus the dividend yield. This measure was chosen because it "is indicative of how effectively a firm is managing shareholder interests and the level at which it is providing shareholders an acceptable total stock market return" (Carpenter et al., 2001: 500). TSR may be relevant to this dissertation because if shareholder returns are low, these individuals may drive the organization to change strategies by electing change-minded individuals to the board of the directors or inducing executives to act through 'ex post settling up' (Fama, 1980). An added benefit of this measure is that it has been employed by other researchers (e.g. Carpenter et al., 2001; Fiss & Zajac, 2006; Sanders & Hambrick, 2007), which facilitates the comparison of results across studies.

More diversified firms may be more likely to undergo change (Markides, 1995). To control for the possibility of this effect, *Diversification* was controlled for using the entropy measure. The entropy measure was chosen for two reasons. First, research has shown that the entropy measure is preferred when an outcome may be sensitive to the effects of business portfolio composition (Robins & Wiersema, 2003). Following these findings, the entropy measure was chosen because strategic change may be driven by the degree of diversification in a firm's business portfolio. Second, the measure is commonly employed, which facilitates comparison of results across studies. The entropy measure is calculated as follows, where P_i is the percentage of total firm sales in the *i*th business unit and n is the firm's number of business units:

$$entropy = \sum_{i=1}^{n} P_i \ln(1/P_i)$$

Characteristics of the organization's board of directors (BOD) have also been related to strategic change (e.g. Hoskisson, Johnson, & Moesel, 1994; Sanders, 2001; Westphal & Zajac, 1994). It is important, then, to control for these variables. In particular, the composition and independence of the BOD have been related to strategic change (Rajagopalan & Spreitzer, 1997). *BOD Composition* was calculated as the percentage of non-officer directors serving on the BOD (Carpenter, 2000). *BOD Independence* was calculated using the ratio the outsiders (i.e. those individuals that are not current employees of the firm) to total board members (Sanders & Carpenter, 1998).

The ability of the CEO to enact change may be influenced by the position the CEO holds on the BOD (Zajac & Westphal, 1996). In particular, CEOs may have undue influence over the actions of the organization if they also serve as Chairman (a condition known as CEO Duality). *CEO Duality* was controlled for by adding a categorical variable with a value of one to the model if a CEO is also Chairman of the BOD, and a value of zero if the CEO is not the Chairman of the BOD.

It has also been argued that the existence of blockholders may inhibit the ability of the CEO to initiate change (Amihud & Lev, 1981). To control for this possibility, *Blockholder Ownership* was included in the model. Blockholder ownership was calculated as a percentage of the organization's stock that is owned by individuals who own greater than 5 percent of the company's stock. Because the CEO may also be a blockholder, which enhances the ability to initiate change, this was controlled for. *CEO Ownership* was calculated as the percentage of stock in the company that the CEO owns. To help isolate the effects of long-term compensation, it is important to control for higher levels of annual compensation not tied to long-term forms, because annual compensation

may also affect a CEO's propensity to implement changes (Carpenter, 2000). *Annual Compensation* was calculated as the total value of all compensation not paid in long-term forms (e.g. cash, bonus, and other forms of annual compensation).

CHAPTER IV

RESULTS

This chapter presents the results of statistical analysis used to test the hypotheses that were outlined in Chapter II. The results are presented in five sections. First, information about the data collection process is provided. Second, descriptive statistics and correlations are reported. Third, the underlying properties of the data are tested to determine the appropriate analytical technique to utilize. Fourth, the results of the hypotheses testing are reported across two different conceptualizations of strategic change (i.e. strategic variation and strategic deviation) and time periods (i.e. one-year, three-years) as discussed in Chapter III. Fifth, post-hoc analysis was conducted. The chapter concludes with a summary of the findings.

Sample Description

The target sample was defined in Chapter III as publicly traded corporations operating in the United States from 1996 through 2006. The target sample was further identified as having the following four characteristics. First, firms operating in heavily regulated industries were omitted because these firms may not be able to alter their strategies without the consent of the government (e.g. McGahan & Porter, 1997; Sanders, 2001). Second, firms operating in industries with less than three competitors were

omitted since it is not possible to distinguish to what extent industry membership effects the strategic decisions of these firms (e.g. McGahan & Porter, 1997). Third, firms with a CEO that held a temporary or joint appointment were omitted because the effect that these individuals have on the strategic initiatives of their organizations may be different than a CEO who is permanently and solely appointed (e.g. Ballinger & Marcel, 2010). Fourth, firms with less than $100 million in assets and sales and those with less than four years of data reported were omitted to guard against the possibility that these were set up solely for the disposition of assets and as such, lack a strategy from which to change (e.g. McGahan & Porter 1997; McNamara et al., 2005). A total of 914 firms met the sample definition.

Data was collected on each of the firms over the sampling time-frame of 1996 to 2006. Multiple data sources were utilized since no single data source contained all of the variables necessary to test the hypothesized relationships. Financial statement data was gathered from the COMPUSTAT database while data on CEOs was gathered from COMPUSTAT's Execucomp database. Data on other executive and board of director characteristics was gathered from a variety of sources, including the Mergent and RiskMetrics databases as well as *The Dun & Bradstreet Reference Book of Corporate Management*.

Because outliers have the potential to bias results, Hair and colleagues (Hair, Black, Babin, Anderson & Tatham, 2006) recommend testing for the presence of influential values prior to analysis. The presence of outliers is problematic for at least two reasons (Whitley, 2001). First, outliers can distort statistical analysis because extreme values can bias estimates towards the outlying observations. Second, outliers

may not be representative of the population of interest, a fact that hinders the ability to generalize findings. A common threshold for identifying outliers is using values in excess of three standard deviations away from the mean (McNamara et al., 2005). Following this threshold, outlying firm-year observations were identified using studentized residuals and removed one at a time (Hair et al., 2006). Analysis was re-run after each removal until no values exceeded the three standard deviation threshold. A total of thirty-two observations were removed, resulting in a final sample of 6,957 observations across 914 firms.

As prior researchers have noted (e.g. Finkelstein & Hambrick, 1990; Chatterjee & Hambrick, 2007; Westphal et al., 2001), not all firms either incur or report expenses on each of the six indicators of strategic change. This can be problematic in calculating strategic change because several firms may have missing observations on at least one of the six indicators. In this study, only 617 firm-year observations across 165 firms did not have missing data on one of the six indicators of strategic change. As a result, 6,340 firm-year observations would need to be dropped from the sample if all six indicators of strategic change were utilized. Because removing that many observations would compromise power (Cohen, 1992; Hair et al., 2006), an alternative measure of strategic change utilizing only four of the indicators was employed (e.g. Finkelstein & Hambrick, 1990; Chatterjee & Hambrick, 2007).

The alternative measure is calculated in the same fashion as the original measure with the exception that two indicators with the most missing data, research and development expenses and advertising expenses, are removed (Finkelstein & Hambrick, 1990). The original measure with six indicators and the alternative measure with four

indicators exhibited significant positive correlations ($p < .001$) across each of the four dependent variables discussed in Chapter III (i.e. one- and three-year strategic variation, one- and three-year strategic deviation). This finding, presented in Table 2, provides support for the use of the alternative four-indicator measure as a reasonable substitute for the original six-indicator measure (Hair et al., 2006; Whitley, 2001).

Table 2

Correlations between Original and Alternative Measures of Strategic Change

Measure	**r**
One-Year Strategic Variation	0.8548
Three-Year Strategic Variation	0.8396
One-Year Strategic Deviation	0.9993
Three-Year Strategic Deviation	0.9995

All correlations significant at $p < .001$.

Two additional factors further reduced the sample size. First, additional observations were lost as a result of firms failing to report data on all four indicators. Although the alternative measure using only four indicators helps reduce the potential for unreported data since firms only have to report four indicators rather than six, some firms still did not report all four indicators. As a result, these firms had to be removed from the sample because it is not possible to calculate the dependent variable if data is missing (Finkelstein & Hambrick, 1990). Second, firms may not report the same indicators over time. This fact affects the ability to calculate strategic change. For example, if a firm reports an indicator in year t but not in year $t + 1$ or in year $t + 3$, it is not possible to determine to what extent the indicator changed over the respective time frame. As such, additional observations were lost when firms did not report indicators consistently over time. The number of firms that did not report indicators consistently was different between the two time periods utilized (i.e. one-year and three-year). More firms did not

report indicators consistently over three years than over a single year. As such, the final sample contains more observations when one-year values are utilized to calculate the dependent variable than when three-year values were utilized. The final sample consisted of 4,807 firm-year observations across 772 firms for one-year strategic variation and one-year deviation and 4,715 firm-year observations across 731 firms for three-year strategic variation and three-year deviation.

Descriptive Statistics and Correlations

Descriptive statistics are displayed in Table 3 and a correlation matrix is presented in Table 4. Four items are worth noting from the correlation matrix. First, none of the focal variables (i.e. long-term compensation structure, age, tenure, option-based overconfidence, stock-based overconfidence) correlate significantly with any of the four dependent variables. A lack of correlation between variables in a hypothesized relationship indicates that these variables are not directly related to each other (Hair et al., 2006). However, correlational analysis is not sufficient when analyzing whether one variable affects another, particularly over time (Pearson, Lee & Elderton, 1910; Yule, 1906). Rather, correlations are valid for use only in determining association between variables; additional analysis using more advanced techniques should be utilized to determine whether one variable affects another (Yule, 1926). The results of analysis using more advanced techniques are discussed in the next section. Second, the two measures of overconfidence (option-based and stock-based) do not correlate significantly. This is worth noting because a lack of correlation between the two measures of the same construct indicates that one or both of the measures may not adequately assess overconfidence since two measures of the same construct should correlate (Hair et al.,

2006). Third, the three measures of firm performance (Industry Adjusted ROA, ROA, and TSR) are significantly correlated, so tests are likely to be consistent across the three variables (Whitley, 2001). Fourth, three of the four dependent variables (all except three-year strategic deviation) are significantly correlated with their prior values. This is useful as a visual check for autocorrelation and indicates that additional tests of autocorrelation should be conducted (Hair et al., 2006). The results of the additional tests and a more thorough explanation of autocorrelation are provided in the next section.

Table 3

Descriptive Statistics

Variable Name	**Mean**	**SD**
One-Year Strategic Variation	-1.05	1.35
Prior One-Year Strategic Variation	-1.07	1.32
Three-Year Strategic Variation	-1.06	1.38
Prior Three-Year Strategic Variation	-1.10	1.34
One-Year Strategic Deviation	5.20	21.67
Prior One-Year Strategic Deviation	5.01	18.53
Three-Year Strategic Deviation	4.62	19.24
Prior Three-Year Strategic Deviation	-0.43	27.80
Long-Term Compensation Structure	0.51	0.28
Tenure	7.22	6.43
Age	55.59	6.87
Option-based Overconfidence	9698.8	23118.1
Stock-based Overconfidence	1.53	4.15
Size	7.59	1.43
Unabsorbed Slack	2.09	1.61
Industry Adjusted ROA	0.04	0.09
ROA	0.05	0.09
TSR	14.12	40.35
Diversification	0.55	0.55
BOD Composition	0.2	0.11
BOD Independence	0.67	0.17
CEO Duality	0.66	0.47
Blockholder Ownership	16.84	29.15
CEO Ownership	1.96	5.76
Annual Compensation	1473.2	1466.98

Table 4

Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	One-Year SV																								
2	Prior One-Year SV	**.37**																							
3	Three-Year SV	**.51**	**.33**																						
4	Prior Three-Year SV	**.32**	**.52**	**.32**																					
5	One-Year SD	.02	.01	-.02	.01																				
6	Prior One-Year SD	.01	.01	-.01	.02	**.07**																			
7	Three-Year SD	.02	.01	.02	.00	.03	.02																		
8	Prior Three-Year SD	.01	.01	-.01	.02	**.07**	**.99**	.02																	
9	Long-Term Compensation Structure	.01	.02	.00	.00	.00	-.01	.01	-.01																
10	Tenure	-.01	-.03	.00	-.04	.00	.00	-.01	.00	**-.18**															
11	Age	-.01	-.02	.02	-.02	-.02	-.02	-.01	-.02	**-.14**	**.43**														
12	Option-based Overconfidence	-.02	-.02	-.04	-.02	.05	.04	.01	.04	**.13**	**.08**	.02													
13	Stock-based Overconfidence	.00	.01	.05	.01	.01	.00	.00	.00	-.02	-.01	-.03	.00												
14	Size	-.04	-.02	.00	-.02	-.02	-.01	-.01	-.01	**.29**	**-.12**	**.08**	**.18**	.00											
15	Unabsorbed Slack	.01	-.02	.00	.00	-.01	-.01	-.02	-.01	-.01	**.15**	-.02	.01	-.01	**-.36**										
16	Industry Adjusted ROA	**-.13**	**-.13**	**-.16**	**-.11**	-.01	**-.06**	.01	**-.06**	**-.03**	**.06**	**.05**	**.08**	-.01	-.01	.01									
17	ROA	**-.13**	**-.14**	**-.15**	**-.12**	.00	**-.05**	.01	**-.05**	**-.04**	**.07**	**.05**	**.07**	-.01	-.02	.02	**.93**								
18	TSR	-.05	.01	**-.07**	.01	-.01	.01	-.01	.01	.01	**.03**	-.02	**.21**	-.01	**-.02**	**.09**	**.14**	**.15**							
19	Diversification	.01	.00	.02	-.02	-.02	-.01	**-.05**	-.01	**.05**	**-.05**	**.10**	.01	.02	**.28**	**-.15**	**-.07**	**-.07**	**-.04**						
20	BOD Composition	-.02	-.03	-.01	-.01	.02	.02	.02	.02	**-.20**	**.26**	**.04**	.00	.00	**-.26**	**.14**	**.05**	**.06**	.02	**-.17**					
21	BOD Independence	.02	.01	.01	.00	-.04	-.03	-.05	-.03	**.18**	**-.19**	-.01	.00	-.02	**.20**	**-.07**	**-.03**	**-.04**	-.02	**.16**	**-.61**				
22	CEO Duality	.02	-.01	.03	-.01	.00	-.01	-.02	-.01	.00	**.26**	**.28**	**.06**	.00	**.18**	**-.08**	.02	.02	.00	**.08**	**-.09**	**.13**			
23	Blockholder Ownership	-.02	-.01	.02	-.01	**.06**	**.07**	-.02	**.07**	**.05**	-.01	**-.04**	**.03**	-.01	**-.03**	**.02**	**-.03**	-.02	-.02	**.04**	**.07**	**-.05**	.02		
24	CEO Ownership	.02	.02	.04	.02	.00	.01	.00	.01	**-.25**	**.41**	**.13**	.01	**.10**	**-.21**	**.10**	**.06**	**.06**	**.03**	**-.07**	**.32**	**-.26**	**.12**	.00	
25	Annual Compensation	-.04	-.01	**-.06**	-.02	-.02	.01	-.02	.01	**.07**	**.02**	**.12**	**.20**	**.00**	**.49**	**-.16**	**.10**	**.08**	**.06**	**.15**	**-.10**	**.07**	**.16**	**-.04**	**-.08**

Bold coefficients are significant at the $p < .05$ level. Strategic Variation is abbreviated SV and Strategic Deviation is abbreviated SD.

Underlying Properties of the Data

Following the analysis of the correlation matrices, the underlying properties of the data were assessed. It is necessary to assess the underlying properties of the data for two reasons (Hair et al., 2006). First, this helps to identify problems present in the dataset that must be accounted for in analyses. Second, without understanding the underlying properties of the dataset, one cannot know if a particular analytical technique is appropriate to use in conjunction with those properties. Certo and Semadeni (2006) suggest four properties that must be assessed in longitudinal analysis. Following this recommendation, the following four properties were assessed: heteroskedasticity, firm-specific heterogeneity (which is also referred to as the presence of 'fixed effects'), autocorrelation and contemporaneous correlation. Hair and colleagues (2006) recommend assessing whether multicollinearity is present whenever more than two variables are included in analyses. As such, multicollinearity was also assessed. Additional information on each of these properties and their tests is provided in this section. Tests were conducted on each of the four dependent variables (i.e. one- and three-year strategic variation; one- and three-year strategic deviation).

Heteroskedasticity

Heteroskedasticity occurs when errors terms do not exhibit constant variance. The unequal variance can bias estimates of standard error unless they are corrected (Greene, 2008; White, 1980). This occurs because the formula used to derive the standard errors relies on the assumption that error terms are constant across all observations. If this assumption is not true, it is not possible to accurately estimate the

standard error unless an adjustment is made to the formula that corrects for this problem (Greene, 2008; White, 1980).

The Breusch-Pagan test was utilized to assess whether heteroskedasticity was present. This test assesses a null hypothesis that the variance of the residuals is equal. Results rejected the null hypotheses ($p < 0.001$), which indicates that heteroskedasticity was present for each of the four dependent variables. To correct for heteroskedasticity, robust standard errors (White, 1980) were utilized. The calculation of robust standard errors does not rely on the assumption that variance is constant. As a result, more consistent and valid estimates of the standard error are produced (Greene, 2008).

Firm-Specific Heterogeneity

Firm-specific heterogeneity refers to the possibility that firms differ in a consistent fashion. If the manner in which the firms differ affects the dependent variable but is not accounted for in the analyses (e.g. it is unknown, unobservable, or omitted due to oversight), estimates can be biased (Certo & Semadeni, 2006; Greene, 2008). That is, failure to include a variable in which the firms differ as a predictor can bias estimates if that variable affects the dependent variable. Firm-specific heterogeneity may exist in this sample because firms can differ in ways that affect their strategic change initiatives but that is unknown or unobserved.

Incorporating firm-specific fixed effects in analyses can help account for firm-specific differences that are constant across time and are otherwise not included as predictor variables (Bowen & Wiersema, 1999; Hitt, Gimeno & Hoskisson, 1998). This is done by creating a unique predictor for each firm and including this firm-specific predictor (known as a 'fixed effect') in calculation of the estimates (Greene, 2008). To

determine if firm-specific fixed effects should be included, Hausman tests were conducted. Hausman tests assess a null hypothesis that adding fixed effects does not improve the fit of the model versus the alternative hypotheses that adding fixed effects significantly improves the model. Results indicated that fixed effects estimations were appropriate, as is indicated by a rejection of the null hypotheses ($p < 0.001$). As a result, fixed effects were utilized in all analyses.

Contemporaneous Correlation

As Beck and Katz (1995) note, contemporaneous correlation exists when error terms are correlated within a time period but not across time periods (i.e. errors at time *t* are correlated with each other but the errors at time *t* are not correlated with errors at other time periods such as $t - 1$ or $t + 1$). Contemporaneous correlation is endemic to longitudinal analysis since unique 'events' can occur within a time period that affect a high percentage of the sample within that time period in a similar fashion (Beck & Katz, 1995; Certo & Semadeni, 2006). The adoption of the Sarbanes-Oxley Act is an example of such an 'event' since the uncertainty with respect to how the act would affect large, publicly-held firms may have affected a high percentage of the sample in 2002. If these events affect the dependent variable and are not accounted for in the analyses, estimates can be biased. This is because analyses is not factoring in the effect of the event on the dependent variable in a given time period.

To account for contemporaneous correlation, scholars (e.g. Beck & Katz, 1995; Certo & Semadeni, 2006) have recommended using 'time dummy' variables. Time dummy variables are unique binary indicators added for each time period in the sample. The variable is assigned a value of 1 if a firm-year observation equals the period of the

time dummy and a value of 0 if not. Adding time dummies helps account for the possibility that events unique to certain time periods may affect the occurrence of the dependent variable.

Since data was collected on a yearly basis, time dummies were assigned for each year in the sample. For example, all observations in the year 2000 would have a value of 1 in the time dummy '2000' and a value of 0 in all other time dummy years (i.e. 1996-1999; 2001-2006). To avoid multicollinearity, the first year in the sample (i.e. 1996) was not assigned a time dummy since a value of zero in all other years is equivalent to a value of 1 in 1996. A significant change in F ($p < .05$) in the presence of time dummies supported the inclusion of time dummy variables. This indicates the inclusion of time dummy variables significantly improves the fit of the model. For clarity in the presentation of results, time dummies are omitted from all tables (Certo & Semadeni, 2006).

Autocorrelation

Autocorrelation occurs when a firm-year observation is correlated with other firm-year observations of the same variable. The presence of autocorrelation can lead to biased estimates if unaccounted for (Greene, 2008). This occurs because the calculations used to derive the estimates assume that these variables are independently and randomly distributed and thus, are not systematically correlated (Certo & Semadeni, 2006). However, if this assumption is not true, the estimates of the standard error will be biased unless an adjustment is made to the derivations to account for this correlation (Greene, 2008). A Baltagi-Wu test was conducted to diagnose whether observations were autocorrelated across time periods. This test analyzes whether the errors are correlated

across time periods as indicated by values below 2.0 (Baltagi & Wu, 1999). Results indicated that autocorrelation was present when three-year strategic variation was the dependent variable (< 1.50), but not when one-year strategic variation or either one- or three-year strategic deviation were assessed (values > 2.0). Accordingly, autocorrelation must be accounted for in the estimation of models where three-year strategic variation is the dependent variable.

Since significant autocorrleation is not present in three of the models (i.e. when the dependent variable is one-year strategic or one- or three-year strategic deviation), utilizing GMM is not appropriate because instrumenting to remove autocorrelation is less efficient in this scenario and may lead to inconsistent estimates (Roodman, 2006). As such, fixed effects regression with robust standard errors was selected for analysis in which autocorrelation was not present. For longitudinal analysis in which fixed effects, heteroskedasticity and contemporaneous correlation are present, researchers (e.g. Certo & Semadeni, 2006; Beck & Katz, 1995) have recommended the use of this technique over others (e.g. ordinary least squares; generalized least squares), particularly when the number of time periods (*t*) is less than the number of observations (*n*) as is the case in this study. This is because both ordinary least squares (OLS) and generalized least squares (GLS) estimates can lead to biased estimates in the presence of heteroskedasticity and contemporaneous correlation, a fact that is accentuated in longitudinal data where *t* is less than *n*. Accordingly, fixed effects regression with robust standard errors was employed for all analyses other than when three-year strategic variation is the dependent variable. For analyses in which three-year strategic variation is the dependent variable, a generalized method of moments (GMM) with robust standard errors employing the

Arellano-Bond (Arellano & Bond, 1991) difference method was utilized as was discussed in Chapter III.

Multicollinearity

Multicollinearity occurs when an independent variable is highly correlated with other independent variables or sets of independent variables (Hair et al., 2006). Because multicollinear variables are so highly associated with each other, they do not have an 'independent' or 'unique' effect on the dependent variable but rather, their effect is 'shared.' As a result, including multicollinear variables can bias estimates unless they are removed because the effect that is 'shared' by the multicollinear variables is included more than once in the derivation of estimates (Greene, 2008). To assess whether multicollinearity was present in the hypothesized models, a variance inflation factor (VIF) was calculated (Hair et al., 2006). VIF values compare the estimates obtained by including a certain variable with estimates that would be obtained if a correlation is constrained to zero. Although there is no test to determine if the estimates are biased by the inclusion of collinear variables, VIF values higher than 10 are a common rule of thumb (Hair et al., 2006). VIF values higher than 10 indicate that estimates of the standard error are at least ten percent higher when the variable is included, and thus are less accurate. As a result, removing the variable will improve the accuracy of estimates.

Two variables exceeded the threshold value of 10 (Hair et al., 2006). First, diversification exceeded the level of VIF when three-year strategic variation was the dependent variable. Because of this result, diversification was omitted from analyses in which three-year strategic variation is the dependent variable. Second, VIF values above

10 were found for industry on all four dependent variables. As such, industry was removed from all analyses.

Hypothesis Tests

Now that the underlying properties of the data have been determined and the analytic techniques selected, the next step is to test the relationships that were hypothesized in Chapter II. The results of all hypotheses tests are presented in this section. As a review, long-term compensation structure was posited to be positively related to strategic change (Hypothesis 1) while executive age (Hypothesis 2) and tenure (Hypothesis 3) were hypothesized to weaken this relationship and overconfidence (Hypothesis 4) was hypothesized to strengthen this relationship. To test the robustness of the hypotheses to concerns associated with the measurement of strategic change, firm performance and overconfidence, multiple measurements of these variables were employed. These included:

1. Utilizing two measures of strategic change (strategic variation and strategic deviation) to capture change relative to different referents.
2. Employing two time intervals (one-year and three-years) since there is not an agreed upon duration for evaluating strategic change.
3. Applying two measures of overconfidence (option-based and stock-based) to attenuate concerns related to the validity of indirect measures of this construct.
4. Assessing firm performance in three ways (ROA, Industry Adjusted ROA, and TSR) to account for limitations of any single measure of performance.

These four measurement adjustments were included in tests of each hypothesized relationship. To facilitate organization of the analysis, all results relative to one dependent variable are discussed prior to moving to the next dependent variable. After each of the dependent variables is presented, a summary of the results of hypotheses testing is provided.

Organization of the Hypothesis Tests

Tests employing fixed effects regressions are presented first, followed by tests using GMM. Fixed effects regressions with robust standard errors were conducted in four steps. First, a 'control model' was run that included only the control variables (Model 1). Second, the main effect of long-term compensation structure was added to the first model (Model 2). Third, separate models were run that added a single moderator (i.e. age, tenure, option-based overconfidence, stock-based overconfidence) to the second model (Models 3 through 6). Fourth, 'full' models (Models 7 and 8) were run that included the three hypothesized moderators of age, tenure and overconfidence in the same model (one model for option-based overconfidence and one for stock-based overconfidence). Results of tests on one-year strategic variation are presented in Tables 5, 6 and 7 while tests on one-year strategic deviation are presented in Tables 8, 9 and 10 and tests on three-year strategic deviation are presented in Tables 11, 12 and 13.

To test the hypothesized relationships on three-year strategic variation, the Arellano-Bond (1991) one-step difference method was employed (Roodman, 2006). Unlike regressions in which models are tested in steps (e.g. control model, main effect model, moderation model, and full model), with GMM it is beneficial to start with what is considered the 'full model' by including all possible regressors (Roodman, 2006). Following this practice (e.g. David et al., 2006; Vaaler, 2008), only the 'full models' are presented. GMM results in Table 14 display six models, one per combination of overconfidence and prior firm performance measures.

Table 5

Fixed effects Regression on One-Year Strategic Variation Controlling for Industry Adjusted ROA

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	-0.27	0.69	-0.27	0.69	-0.26	0.83	-0.18	0.69	-0.31	0.69	-0.25	0.69	-0.50	0.83	-0.44	0.83
Diversification	0.13	0.08	0.13	0.07	0.13	0.07	0.13	0.07	0.13	0.07	0.13	0.08	0.13	0.07	0.14	0.07
Prior One-Year Strategic Variation	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Size	-0.17	0.09	-0.17	0.09	-0.17	0.09	-0.17	0.09	-0.16	0.09	-0.17	0.09	-0.17	0.09	-0.17	0.09
Unabsorbed Slack	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Industry Adjusted ROA	**-0.82**	0.30	**-0.82**	0.30	**-0.82**	0.30	**-0.82**	0.30	**-0.81**	0.30	**-0.82**	0.30	**-0.80**	0.30	**-0.81**	0.30
BOD Composition	0.11	0.37	0.11	0.37	0.10	0.37	0.13	0.37	0.11	0.37	0.10	0.37	0.13	0.37	0.12	0.37
BOD Independence	0.00	0.23	0.00	0.23	-0.01	0.23	0.00	0.23	0.00	0.23	-0.01	0.23	-0.01	0.23	-0.01	0.23
CEO Duality	**0.15**	0.06	**0.15**	0.06	**0.14**	0.07	**0.17**	0.07	**0.15**	0.06	**0.15**	0.06	**0.16**	0.07	**0.16**	0.07
Blockholder Ownership	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CEO Ownership	-0.01	0.01	0.00	0.01	-0.01	0.01	0.00	0.01	-0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Annual Compensation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long-Term Compensation Structure			0.03	0.09	-0.18	0.74	-0.12	0.13	0.03	0.09	0.01	0.09	0.06	0.75	0.05	0.74
Tenure					0.00	0.01							0.01	0.01	0.01	0.01
Age							-0.01	0.01					-0.02	0.01	-0.02	0.01
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											-0.01	0.02			-0.01	0.02
LTCS x Age					0.00	0.01							0.00	0.01	0.00	0.01
LTCS x Tenure							0.02	0.01					0.02	0.01	0.02	0.01
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											0.01	0.03			0.01	0.03
F	**3.33**		**3.20**		**2.97**		**3.01**		**3.00**		**2.92**		**2.64**		**2.58**	
R^2	0.019		0.019		0.019		0.019		0.019		0.019		0.02		0.02	

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the $p < .05$ level.

Table 6

Fixed effects Regression on One-Year Strategic Variation Controlling for ROA

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	-0.27	0.69	-0.27	0.69	-0.25	0.83	-0.18	0.69	-0.31	0.70	-0.25	0.69	-0.49	0.83	-0.43	0.83
Diversification	0.13	0.07	0.13	0.07	0.13	0.07	0.14	0.07	0.13	0.07	0.13	0.08	0.13	0.07	0.14	0.07
Prior One-Year Strategic Variation	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Size	-0.17	0.09	-0.17	0.09	-0.17	0.09	-0.17	0.09	-0.16	0.09	-0.17	0.09	-0.16	0.09	-0.17	0.09
Unabsorbed Slack	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03
ROA	**-1.08**	0.33	**-1.08**	0.33	**-1.08**	0.33	**-1.08**	0.34	**-1.07**	0.34	**-1.07**	0.33	**-1.07**	0.33	**-1.07**	0.33
BOD Composition	0.11	0.37	0.11	0.37	0.11	0.37	0.13	0.37	0.12	0.37	0.11	0.37	0.13	0.37	0.13	0.37
BOD Independence	0.01	0.23	0.01	0.22	0.00	0.23	0.01	0.23	0.01	0.22	0.00	0.22	0.00	0.23	0.00	0.23
CEO Duality	**0.15**	0.06	**0.15**	0.06	**0.14**	0.07	**0.16**	0.07	**0.15**	0.06	**0.15**	0.06	**0.15**	0.07	**0.16**	0.07
Blockholder Ownership	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CEO Ownership	-0.01	0.01	0.00	0.01	-0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Annual Compensation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long-Term Compensation Structure			0.03	0.09	-0.21	0.74	-0.12	0.13	0.03	0.09	0.01	0.09	0.05	0.75	0.03	0.74
Tenure					0.00	0.01							0.01	0.01	0.01	0.01
Age							-0.01	0.01					-0.02	0.01	-0.02	0.01
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											-0.01	0.02			-0.01	0.02
LTCS x Age					0.00	0.01							0.00	0.01	0.00	0.01
LTCS x Tenure							0.02	0.01					0.02	0.01	0.02	0.01
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											0.01	0.03			0.01	0.03
F	**3.40**		**3.27**		**3.05**		**3.08**		**3.07**		**2.98**		**2.71**		**2.64**	
R^2	0.020		0.020		0.020		0.021		0.020		0.020		0.021		0.021	

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the $p < .05$ level.

Table 7

Fixed effects Regression on One-Year Strategic Variation Controlling for TSR

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	0.04	0.69	0.04	0.69	0.05	0.83	0.12	0.69	0.02	0.70	0.05	0.69	-0.19	0.83	-0.15	0.83
Diversification	0.13	0.07	0.13	0.07	0.13	0.07	0.13	0.07	0.13	0.07	0.13	0.07	0.13	0.07	0.13	0.07
Prior One-Year Strategic Variation	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03
Size	**-0.21**	0.09	**-0.21**	0.09	**-0.21**	0.09	**-0.21**	0.09	**-0.21**	0.09	**-0.21**	0.09	**-0.21**	0.09	**-0.21**	0.09
Unabsorbed Slack	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03
TSR	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00
BOD Composition	0.06	0.37	0.06	0.37	0.06	0.37	0.08	0.37	0.06	0.37	0.06	0.37	0.08	0.37	0.08	0.37
BOD Independence	-0.01	0.23	-0.01	0.23	-0.01	0.23	-0.01	0.23	-0.01	0.23	-0.01	0.23	-0.01	0.23	-0.01	0.23
CEO Duality	**0.15**	0.06	**0.15**	0.06	**0.14**	0.07	**0.17**	0.07	**0.15**	0.06	**0.15**	0.06	**0.16**	0.07	**0.16**	0.07
Blockholder Ownership	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CEO Ownership	-0.01	0.01	-0.01	0.01	-0.01	0.01	0.00	0.01	-0.01	0.01	-0.01	0.01	0.00	0.01	0.00	0.01
Annual Compensation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long-Term Compensation Structure			0.02	0.09	-0.15	0.74	-0.12	0.13	0.02	0.09	0.01	0.09	0.11	0.75	0.10	0.75
Tenure					0.00	0.01							0.01	0.01	0.01	0.01
Age							-0.01	0.01					-0.02	0.01	-0.02	0.01
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											-0.01	0.02			-0.01	0.02
LTCS x Age					0.00	0.01							0.00	0.01	0.00	0.01
LTCS x Tenure							0.02	0.01					0.02	0.01	0.02	0.01
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											0.01	0.03			0.01	0.03
F	**3.54**		**3.40**		**3.15**		**3.24**		**3.14**		**3.11**		**2.79**		**2.77**	
R^2	0.020		0.020		0.020		0.021		0.020		0.02		0.021		0.021	

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the $p < .05$ level.

Table 8

Fixed effects Regression on One-Year Strategic Deviation Controlling for Industry Adjusted ROA

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	140.49	94.41	140.59	94.30	-23.55	142.84	121.21	94.98	136.06	95.35	143.73	94.85	-14.11	140.94	-8.14	146.08
Diversification	-7.16	14.22	-6.85	14.25	-8.12	14.14	-7.26	14.23	-7.06	14.24	-6.41	14.26	-8.35	14.12	-7.82	14.14
Prior One-Year Strategic Deviation	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02
Size	-13.65	12.45	-12.02	12.36	-10.19	12.40	-11.13	12.25	-11.49	12.40	-12.17	12.39	-10.11	12.32	-10.45	12.30
Unabsorbed Slack	-3.75	3.80	-3.62	3.79	-3.48	3.80	-3.69	3.84	-3.65	3.79	-3.57	3.79	-3.54	3.83	-3.48	3.83
Industry Adjusted ROA	19.10	62.71	18.20	62.64	21.09	62.80	17.92	62.74	19.06	62.14	18.50	62.65	20.99	62.69	20.81	63.20
BOD Composition	-3.63	74.02	-4.84	73.98	-5.15	73.67	-4.36	74.46	-5.16	73.77	-5.59	74.13	-7.39	74.03	-7.49	74.28
BOD Independence	21.85	58.24	23.12	58.45	26.18	57.83	23.59	58.31	22.38	58.70	22.91	58.52	25.51	58.19	26.12	57.94
CEO Duality	17.44	14.68	16.69	14.56	21.50	14.97	17.32	14.93	16.83	14.56	16.71	14.57	20.34	15.10	20.41	15.11
Blockholder Ownership	0.00	0.45	0.01	0.44	0.00	0.44	-0.01	0.44	0.01	0.44	0.01	0.44	0.01	0.42	0.00	0.43
CEO Ownership	-1.27	1.07	-1.33	1.09	-0.93	0.96	-1.42	1.06	-1.33	1.07	-1.32	1.09	-1.02	0.85	-1.01	0.88
Annual Compensation	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01
Long-Term Compensation Structure			-25.86	20.49	**411.81**	195.57	1.00	27.61	-22.40	18.23	-29.11	21.43	403.69	214.81	399.59	211.81
Age					2.62	1.98							2.37	2.18	2.34	2.19
Tenure							1.63	1.70					0.66	1.96	0.68	1.91
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											-1.64	1.34			-1.49	1.35
LTCS x Age					**-7.99**	3.77							-7.72	4.27	-7.73	4.28
LTCS x Tenure							-3.91	2.82					-0.57	3.45	-0.64	3.38
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											2.41	2.36			1.94	2.43
F	**3.76**		**3.584**		**3.236**		**3.364**		**3.325**		**3.495**		**2.873**		**3.011**	
R^2	0.019		0.019		0.023		0.020		0.019		0.019		0.024		0.024	

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the $p < .05$ level.

Table 9

Fixed effects Regression on One-Year Strategic Deviation Controlling for ROA

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	140.59	94.38	140.70	94.27	-24.09	142.99	121.21	94.97	136.01	95.37	143.86	94.80	-14.81	141.10	-8.63	146.18
Diversification	-7.24	14.18	-6.92	14.21	-8.20	14.10	-7.34	14.19	-7.14	14.20	-6.48	14.23	-8.44	14.08	-7.91	14.10
Prior One-Year Strategic Deviation	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02
Size	-13.73	12.43	-12.10	12.34	-10.29	12.37	-11.21	12.23	-11.56	12.39	-12.26	12.37	-10.18	12.30	-10.55	12.27
Unabsorbed Slack	-3.88	3.80	-3.75	3.79	-3.64	3.80	-3.84	3.84	-3.78	3.78	-3.70	3.78	-3.70	3.83	-3.64	3.83
ROA	32.46	76.07	31.38	75.99	36.69	76.27	32.90	75.83	32.32	75.40	31.93	76.01	36.88	75.77	36.88	76.38
BOD Composition	-4.09	73.87	-5.29	73.83	-5.71	73.51	-4.89	74.29	-5.58	73.63	-6.06	73.97	-7.91	73.86	-8.06	74.10
BOD Independence	21.37	58.17	22.65	58.39	25.62	57.75	23.06	58.21	21.92	58.64	22.43	58.45	24.96	58.10	25.54	57.84
CEO Duality	17.51	14.66	16.76	14.54	21.58	14.94	17.40	14.91	16.90	14.53	16.78	14.54	20.43	15.08	20.50	15.09
Blockholder Ownership	0.00	0.45	0.01	0.44	0.00	0.44	-0.01	0.44	0.01	0.44	0.01	0.44	0.00	0.42	0.00	0.43
CEO Ownership	-1.28	1.07	-1.34	1.09	-0.94	0.96	-1.43	1.06	-1.34	1.07	-1.33	1.09	-1.03	0.85	-1.02	0.87
Annual Compensation	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01
Long-Term Compensation Structure			-25.81	20.48	**413.20**	195.93	1.25	27.52	-22.37	18.22	-29.10	21.43	404.76	215.09	400.68	212.08
Age					2.63	1.98							2.38	2.18	2.35	2.19
Tenure							1.64	1.70					0.67	1.95	0.69	1.90
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											-1.66	1.34			-1.51	1.35
LTCS x Age					**-8.01**	3.78							-7.73	4.27	-7.74	4.28
LTCS x Tenure							-3.94	2.81					-0.59	3.44	-0.66	3.37
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											2.43	2.36			1.97	2.43
F	**3.808**		**3.63**		**3.278**		**3.408**		**3.366**		**3.533**		**2.909**		**3.043**	
R^2	0.019		0.019		0.024		0.020		0.019		0.019		0.024		0.024	

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the $p < .05$ level.

Table 10

Fixed effects Regression on One-Year Strategic Deviation Controlling for TSR

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	135.51	93.64	136.24	93.53	-26.92	142.71	117.12	93.40	130.47	93.67	139.15	94.15	-17.55	139.72	-11.01	146.22
Diversification	-7.17	14.23	-6.87	14.27	-8.16	14.15	-7.28	14.25	-7.07	14.25	-6.42	14.28	-8.40	14.13	-7.87	14.15
Prior One-Year Strategic Deviation	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02	**-0.10**	0.02
Size	-12.97	12.46	-11.39	12.39	-9.62	12.44	-10.53	12.24	-10.70	12.30	-11.51	12.42	-9.47	12.20	-9.89	12.30
Unabsorbed Slack	-3.63	4.09	-3.51	4.08	-3.34	4.08	-3.58	4.13	-3.52	4.07	-3.45	4.08	-3.40	4.11	-3.34	4.11
TSR	0.03	0.10	0.03	0.10	0.02	0.10	0.02	0.10	0.03	0.09	0.03	0.09	0.03	0.09	0.03	0.10
BOD Composition	-1.67	75.45	-2.95	75.40	-3.11	75.14	-2.51	75.93	-3.17	75.09	-3.70	75.55	-5.50	75.43	-5.65	75.77
BOD Independence	22.27	58.34	23.58	58.57	26.84	57.98	24.04	58.44	22.80	58.80	23.35	58.63	26.11	58.34	26.73	58.09
CEO Duality	17.47	14.75	16.71	14.63	21.52	15.02	17.30	15.01	16.86	14.62	16.73	14.63	20.27	15.17	20.34	15.17
Blockholder Ownership	0.01	0.43	0.02	0.43	0.02	0.42	0.01	0.43	0.03	0.43	0.02	0.43	0.02	0.41	0.02	0.42
CEO Ownership	-1.30	1.08	-1.37	1.10	-0.99	0.98	-1.46	1.08	-1.37	1.08	-1.37	1.11	-1.09	0.88	-1.08	0.90
Annual Compensation	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01
Long-Term Compensation Structure			-26.24	20.56	**411.89**	195.67	0.54	27.63	-22.74	18.36	-29.53	21.51	404.08	214.98	400.00	211.95
Age					2.61	1.98							2.35	2.18	2.32	2.19
Tenure							1.63	1.70					0.68	1.95	0.70	1.90
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											-1.66	1.32			-1.50	1.33
LTCS x Age					**-8.00**	3.78							-7.74	4.27	-7.75	4.28
LTCS x Tenure							-3.90	2.83					-0.53	3.47	-0.60	3.39
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											2.44	2.33			1.97	2.40
F	**3.54**		**3.37**		**3.05**		**3.14**		**3.16**		**3.34**		**2.72**		**2.86**	
R^2	0.019		0.019		0.024		0.020		0.019		0.019		0.024		0.024	

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the $p < .05$ level.

Table 11

Fixed effects Regression on Three-Year Strategic Deviation Controlling for Industry Adjusted ROA

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	96.08	110.46	95.98	111.42	98.26	115.51	84.11	109.32	86.58	116.97	92.08	112.23	95.94	122.00	100.03	121.26
Diversification	**-32.07**	11.14	**-32.07**	11.15	**-31.53**	11.26	**-32.45**	11.30	**-31.86**	11.14	**-32.53**	11.08	**-31.59**	11.29	**-32.29**	11.26
Prior Three-Year Strategic Deviation	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02
Size	5.31	13.78	5.28	13.50	4.74	13.35	5.53	13.46	6.68	14.30	5.27	13.49	6.74	14.14	5.36	13.40
Unabsorbed Slack	-6.78	5.31	-6.78	5.30	-6.96	5.28	-6.80	5.32	-6.65	5.31	-7.00	5.29	-6.89	5.31	-7.22	5.30
Industry Adjusted ROA	28.10	36.56	28.15	36.48	28.20	36.54	27.98	36.48	31.11	36.81	27.02	36.70	30.99	36.73	26.93	36.66
BOD Composition	-115.18	88.14	-115.11	88.59	-117.27	88.95	-115.57	88.67	-112.41	88.77	-112.77	89.02	-112.89	88.98	-112.95	89.29
BOD Independence	-65.94	42.63	-65.96	42.56	-66.98	42.81	-65.77	42.45	-63.69	42.25	-64.81	42.60	-64.26	42.28	-65.54	42.68
CEO Duality	3.67	18.80	3.68	18.71	0.74	19.48	2.25	20.28	4.37	18.74	3.55	18.67	0.92	20.40	0.45	20.38
Blockholder Ownership	0.05	0.30	0.05	0.30	0.05	0.30	0.04	0.30	0.04	0.30	0.05	0.30	0.03	0.29	0.04	0.30
CEO Ownership	1.17	1.15	1.17	1.15	1.10	1.10	1.06	1.10	1.14	1.13	1.16	1.15	0.90	1.00	0.94	1.02
Annual Compensation	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01
Long-Term Compensation Structure			0.69	14.76	-67.41	143.23	17.90	20.84	-5.03	15.69	6.73	16.45	-108.56	147.94	-94.12	152.16
Age					0.09	1.60							-0.35	1.69	-0.32	1.72
Tenure							1.44	1.39					1.65	1.55	1.55	1.54
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											2.77	3.68			2.78	3.66
LTCS x Age					1.26	2.71							2.34	2.92	2.29	3.03
LTCS x Tenure							-2.41	1.96					-3.47	2.34	-3.43	2.35
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											-4.74	4.88			-4.65	4.87
F	**3.96**		**3.84**		**3.55**		**3.46**		**3.59**		**3.69**		**3.07**		**3.11**	
R^2	0.024		0.024		0.024		0.024		0.024		0.024		0.025		0.025	

All models include 4,715 firm-year observations across 731 firms. Bold coefficients are significant at the $p < .05$ level.

Table 12

Fixed effects Regression on Three-Year Strategic Deviation Controlling for ROA

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	95.53	110.29	95.44	111.27	97.73	115.43	83.51	109.18	86.09	116.88	91.55	112.07	95.54	121.96	99.62	121.18
Diversification	**-32.11**	11.12	**-32.11**	11.14	**-31.57**	11.24	**-32.49**	11.28	**-31.90**	11.13	**-32.56**	11.07	**-31.64**	11.28	**-32.32**	11.24
Prior Three-Year Strategic Deviation	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02
Size	5.33	13.78	5.30	13.50	4.77	13.35	5.55	13.46	6.69	14.30	5.29	13.49	6.76	14.14	5.39	13.40
Unabsorbed Slack	-6.74	5.27	-6.74	5.26	-6.91	5.24	-6.77	5.29	-6.61	5.27	-6.96	5.25	-6.85	5.27	-7.18	5.27
ROA	22.80	39.72	22.83	39.73	22.29	39.64	23.47	39.97	26.50	40.29	21.49	40.01	26.65	40.22	21.64	40.01
BOD Composition	-115.00	88.01	-114.94	88.46	-117.06	88.84	-115.44	88.55	-112.30	88.65	-112.58	88.89	-112.78	88.88	-112.77	89.18
BOD Independence	-65.63	42.41	-65.64	42.33	-66.63	42.60	-65.48	42.24	-63.39	42.03	-64.48	42.37	-63.96	42.07	-65.21	42.46
CEO Duality	3.71	18.81	3.72	18.73	0.79	19.50	2.29	20.29	4.42	18.75	3.59	18.68	0.98	20.42	0.50	20.40
Blockholder Ownership	0.05	0.30	0.05	0.30	0.05	0.30	0.04	0.30	0.05	0.30	0.06	0.30	0.03	0.29	0.04	0.30
CEO Ownership	1.18	1.15	1.18	1.15	1.10	1.10	1.06	1.11	1.15	1.13	1.17	1.15	0.91	1.00	0.94	1.02
Annual Compensation	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01
Long-Term Compensation Structure			0.59	14.78	-67.15	143.16	17.92	20.87	-5.15	15.72	6.65	16.47	-108.32	147.80	-93.96	152.04
Age					0.09	1.60							-0.35	1.69	-0.32	1.72
Tenure							1.45	1.39					1.66	1.55	1.56	1.54
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											2.77	3.68			2.79	3.66
LTCS x Age					1.25	2.71							2.34	2.92	2.28	3.03
LTCS x Tenure							-2.42	1.97					-3.48	2.35	-3.44	2.35
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											-4.75	4.89			-4.66	4.87
F	**3.96**		**3.83**		**3.55**		**3.46**		**3.59**		**3.69**		**3.07**		**3.11**	
R^2	0.024		0.024		0.024		0.024		0.024		0.024		0.025		0.025	

All models include 4,715 firm-year observations across 731 firms. Bold coefficients are significant at the $p < .05$ level.

Table 13

Fixed effects Regression on Three-Year Strategic Deviation Controlling for TSR

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Constant	86.90	110.04	86.74	111.20	89.71	115.43	74.81	109.39	74.68	117.83	83.26	111.87	83.71	122.37	90.77	120.88
Diversification	**-31.81**	11.12	**-31.82**	11.13	**-31.24**	11.24	**-32.19**	11.27	**-31.61**	11.12	**-32.28**	11.07	**-31.29**	11.27	**-31.99**	11.24
Prior Three-Year Strategic Deviation	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02	**-0.11**	0.02
Size	6.40	13.76	6.36	13.49	5.86	13.36	6.62	13.47	8.12	14.45	6.28	13.47	8.26	14.32	6.46	13.41
Unabsorbed Slack	-6.58	5.19	-6.58	5.19	-6.77	5.16	-6.60	5.22	-6.43	5.20	-6.82	5.18	-6.67	5.20	-7.03	5.19
TSR	0.03	0.06	0.03	0.06	0.03	0.06	0.03	0.06	0.04	0.06	0.03	0.06	0.04	0.06	0.03	0.06
BOD Composition	-111.40	87.62	-111.30	88.10	-113.45	88.47	-111.57	88.22	-108.33	88.37	-108.96	88.49	-108.48	88.64	-108.76	88.84
BOD Independence	-64.80	42.20	-64.83	42.13	-65.90	42.36	-64.62	42.01	-62.65	41.82	-63.66	42.16	-63.30	41.82	-64.44	42.21
CEO Duality	3.85	18.78	3.88	18.69	0.88	19.48	2.60	20.25	4.61	18.70	3.74	18.65	1.23	20.38	0.75	20.37
Blockholder Ownership	0.06	0.30	0.06	0.30	0.06	0.30	0.05	0.30	0.06	0.30	0.06	0.30	0.04	0.30	0.05	0.30
CEO Ownership	1.30	1.19	1.30	1.19	1.23	1.14	1.19	1.14	1.26	1.16	1.30	1.19	1.05	1.04	1.09	1.06
Annual Compensation	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01
Long-Term Compensation Structure			0.94	14.81	-71.02	143.30	18.27	20.88	-4.66	15.73	7.07	16.49	-113.14	148.21	-98.36	152.45
Age					0.07	1.60							-0.35	1.69	-0.32	1.72
Tenure							1.41	1.39					1.62	1.55	1.52	1.54
Option-based Overconfidence									0.00	0.00			0.00	0.00		
Stock-based Overconfidence											2.80	3.67			2.82	3.66
LTCS x Age					1.33	2.72							2.44	2.93	2.38	3.04
LTCS x Tenure							-2.43	1.96					-3.52	2.35	-3.49	2.36
LTCS x Options									0.00	0.00			0.00	0.00		
LTCS x Stocks											-4.81	4.88			-4.71	4.87
F	**3.98**		**3.85**		**3.55**		**3.48**		**3.70**		**3.73**		**3.14**		**3.13**	
R^2	0.024		0.024		0.024		0.024		0.024		0.024		0.025		0.025	

All models include 4,715 firm-year observations across 731 firms. Bold coefficients are significant at the $p < .05$ level.

Table 14

GMM on Three-Year Strategic Variation

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
Prior Three-Year Strategic Variation	**0.17**	0.06	**0.16**	0.06	**0.19**	0.06	**0.16**	0.05	**0.16**	0.05	**0.17**	0.05
Size	0.07	0.06	0.06	0.06	0.03	0.06	0.07	0.06	0.06	0.06	0.04	0.06
Unabsorbed Slack	-0.06	0.03	**-0.07**	0.03	**-0.07**	0.03	-0.04	0.03	-0.04	0.03	-0.05	0.03
ROA			**-1.23**	0.34					**-1.25**	0.34		
Industry Adjusted ROA	**-1.27**	0.33					**-1.28**	0.33				
TSR					0.00	0.00					0.00	0.00
BOD Composition	0.37	0.51	0.43	0.52	0.13	0.55	0.44	0.51	0.48	0.51	0.24	0.53
BOD Independence	-0.58	0.45	-0.57	0.45	-0.57	0.46	-0.61	0.43	-0.60	0.43	-0.59	0.44
CEO Duality	0.13	0.11	0.12	0.11	0.11	0.11	0.10	0.11	0.09	0.11	0.10	0.10
Blockholder Ownership	**0.01**	0.00	**0.01**	0.00	**0.01**	0.00	**0.01**	0.00	**0.01**	0.00	**0.01**	0.00
CEO Ownership	-0.01	0.01	-0.01	0.01	-0.01	0.01	0.00	0.01	0.00	0.01	-0.01	0.01
Annual Compensation	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**	0.00
Long-Term Compensation Structure	0.63	0.79	0.57	0.79	0.61	0.79	0.61	0.84	0.56	0.84	0.66	0.85
Tenure	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Age	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Option-based Overconfidence	0.00	0.00	0.00	0.00	0.00	0.00						
Stock-based Overconfidence							0.00	0.00	0.00	0.00	0.00	0.00
LTCS x Tenure	0.00	0.02	-0.01	0.02	-0.01	0.02	0.00	0.02	0.00	0.02	0.00	0.02
LTCS x Age	-0.01	0.02	-0.01	0.02	-0.01	0.02	-0.01	0.02	-0.01	0.02	-0.01	0.02
LTCS x Options	0.00	0.00	0.00	0.00	0.00	0.00						
LTCS x Stocks							0.00	0.00	0.00	0.00	0.00	0.00
Chi^2	**62.83**		**62.75**		**47.55**		**120.27**		**116.28**		**93.58**	
AR(1)	**-8.04**		**-8.04**		**-7.89**		**-8.03**		**-8.02**		**-7.94**	
AR(2)	-1.17		-1.16		-0.96		-1.24		-1.25		-1.14	
Hansen's J	514.49		512.38		556.15		510.67		497.92		540.60	

All models include 3,866 firm-year observations across 714 firms. Bold coefficients are significant at the .05 level.

Results

One-Year Strategic Variation

Results of the fixed effects regression with robust standard errors on one-year strategic variation are presented in Tables 5 through 7. These tests included 4,807 firm-year observations across 772 firms. Each of the models had appropriate fit, as indicated by a significant *F* statistic. A significant *F* statistic indicates that the models can be utilized to test whether the variables in the model are significantly related to the dependent variable (Hair et al., 2006).

The hypothesized variables were not significantly related to the dependent variable of one-year strategic variation on any of the models in Tables 5 through 7. This is indicated by non-significant coefficients on any of the hypothesized variables (i.e. *Long-term Compensation Structure, LTCS x Age, LTCS x Tenure, LTCS x Options, and LTCS x Stocks*). This finding suggests that none of the four hypotheses were supported on one-year strategic variation. Further, this relationship was found to be consistent across three measures of firm performance and two measures of overconfidence. That is, long-term compensation structure was not found to significantly relate to a one-year strategic variation regardless of the measure of firm performance utilized. Further, hypothesized moderators (executive age, tenure and both option- and stock-based overconfidence) did not significantly affect this relationship as hypothesized.

One-Year Strategic Deviation

Analyses that tested the hypothesized relationships with one-year strategic deviation as the dependent variable are presented in Tables 8 through 10. These tests were conducted on a sample of 4,807 firms across 772 firms. All models exhibited

appropriate fit, as indicated by a significant *F* statistic. This suggests that the models can be utilized to test whether the predictor variables are significantly related to the dependent variable (Hair et al., 2006).

The results of these tests do not support the hypothesized relationships. Although a significant and positive coefficient on long-term compensation (Hypothesis 1) and a significant and negative interaction with executive age (Hypothesis 2) were found in some tests (i.e. Model 3 in Tables 8, 9 and 10 only; significant change in *F* at $p < .05$), the fact that these findings were not robust to the addition of executive tenure and/or overconfidence indicates that Hypotheses 1 and 2 did not receive support. This is because these relationships were not significantly related when alternative explanatory variables were included (Hair et al., 2006). If a significant relationship becomes non-significant when an alternative predictor variable is added to a model, the first relationship cannot be supported as significant (Hair et al., 2006). So while the hypothesized relationships were found in Model 3 of Tables 8, 9, and 10, the fact that these relationships were not significant when adding executive tenure and overconfidence to the models indicates that Hypotheses 1 and 2 cannot be supported on one-year strategic deviation. Hypotheses 3 and 4 were not supported in any of the tests, as is indicated by non-significant coefficients on the hypothesized interaction terms (i.e. *LTCS x Tenure, LTCS x Options, and LTCS x Stocks*).

Three-Year Strategic Deviation

Tests of the hypothesized relationships with three-year strategic deviation as the dependent variable are presented in Tables 11 through 13. Analyses were conducted on a sample of 4,715 firm-year observations across 731 firms. Significant *F* statistics were

found for all models, indicating appropriate fit. This finding suggests that that the models can be utilized to test hypotheses (Hair et al., 2006).

Non-significant coefficients were found on all of the hypothesized variables (i.e. *Long-term Compensation Structure, LTCS x Age, LTCS x Tenure, LTCS x Options, and LTCS x Stocks*). These findings do not support any of the four hypotheses, regardless of measures utilized. Long-term compensation structure was not found to significantly relate to three-year strategic deviation. This is indicated by the non-significant coefficients on L*ong-term Compensation Structure* on all tests in which three-year strategic deviation is the dependent variable. Further, this relationship was not found to be significantly moderated by executive age, tenure or overconfidence. This is evidenced by non-significant interaction terms (i.e. *LTCS x Age, LTCS x Tenure, LTCS x Options, and LTCS x Stocks*) in these tests. Cumulatively, these findings indicate that none of the four hypotheses are supported since none of the posited relationships were found to be significantly related to three-year strategic deviation.

Three-Year Strategic Variation

To test the hypothesized relationships on three-year strategic variation, a generalized method of moments (GMM) employing the Arellano-Bond (1991) one-step difference method with robust standard errors was performed. The results for these tests appear in Table 14. Because GMM uses a system of equations to create instrumental variables, the sample size was reduced in tests utilizing GMM in two ways. First, GMM requires data from a prior time period (i.e. t - 1) to estimate instruments for current time periods (i.e. t). Because GMM requires an additional observation for use as an instrument (i.e. t – 1), any firms that had only four years of data had to be removed from

analysis since a minimum of five years of data is necessary (i.e. from $t - 1$ to $t + 3$). This occurs because it is not possible to utilize the first time period (i.e. $t - 1$) to create instruments for the current time period (t) and still have three years of time elapse to calculate the dependent variable over three years (i.e. in time $t + 3$) if only four years of data are present. Second, because GMM uses the first observation for each firm to calculate instruments for subsequent observations, the sample size is reduced by one observation per firm. As such, the final sample size for GMM models was reduced to 3,866 firm-year observations across 714 firms.

All GMM specifications were met for each of the six models, suggesting the GMM models are valid for use in hypotheses testing (Roodman, 2006). Each models exhibited appropriate fit ($Chi^2 < .05$), which suggests that the models can be utilized to test whether significant relationships exist (Hair et al., 2006). The Arellano-Bond test was utilized to establish instrumental validity, which is indicated by a significant AR(1) and a non-significant AR(2). Instrumental validity suggests that the instrumental variables calculated are valid for use in estimating the GMM as they do not exhibit autocorrelation. The overidentification restriction was assessed using Hansen's J. The Hansen's J is used because the Sargan test is inconsistent with robust standard errors (Roodman, 2006). A non-significant Hansen's J indicates that that the instruments are independent of the residuals and are valid for use.

Results of the GMM do not support any of the four hypothesized relationships. This is indicated by non-significant coefficients on the hypothesized variables (*Long-term Compensation Structure, LTCS x Age, LTCS x Tenure, LTCS x Options, and LTCS x Stocks*). Long-term compensation was not found to significantly relate to three-year

strategic variation across any of the six models. Similarly, none of the moderators significantly affected the strength of this relationship. In light of these findings, the hypothesized relationships are not supported when three-year strategic variation is the dependent variable.

Summary of Hypotheses Testing

It was contended in Chapter II that long-term compensation structure would positively relate to strategic change and that executive age, tenure and overconfidence would moderate this relationship. These hypotheses were tested on four different measures of strategic change (i.e. two conceptualizations of change assessed at two time intervals). The results of those tests do not provide support for any of the hypothesized relationships.

When one-year strategic deviation was used as the dependent variable, long-term compensation structure was found to be significantly related to strategic change (Hypothesis 1) and age was found to significantly weaken this relationship (Hypothesis 2). However, because this relationship was not robust to the addition of alternative explanatory variables, these hypotheses are not supported (Hair et al., 2006). This is because significant relationships that become non-significant with the inclusion of additional predictor variables are not robust to alternative explanations. As such, these relationships are not supported (Hair et al., 2006). Because Hypotheses 1 and 2 were not robust to the addition of tenure and/or overconfidence as alternative explanatory variables, these hypotheses do not receive support.

Further, these two relationships (i.e. Hypotheses 1 and 2) were found only when one-year strategic deviation was used as the dependent variable. These hypotheses did

not receive support with any other dependent variable. Because the relationship occurs only when a specific measure is utilized (i.e. one-year strategic deviation), we cannot contend that the relationship exists (Hair et al., 2006). That is, since a relationship only exists in the context of a specific measure of a strategic change but not with other measures of strategic change, we cannot contend that the relationship exists since it is not robust to various measures (Hair et al., 2006). In summation, because Hypotheses 1 and 2 are not robust to the addition of alternative explanatory variables or alternative measures of strategic change, they are not supported.

Hypotheses 3 and 4 were not supported in any of the tests. This is indicated by the fact that none of the coefficients were significant for the hypothesized variables (i.e. *LTCS x Tenure, LTCS x Options, and LTCS x Stocks*) in any of the tests that were run. As such, Hypothesis 3, which posited a weakening effect of tenure on the relationship between long-term compensation structure and strategic change, was not supported. Similarly, support for Hypothesis 4, which contended that overconfidence would significantly strengthen the relationship between long-term compensation and strategic change, was not found in any of the tests. This finding was consistent whether an option-based or a stock-based measure of overconfidence was utilized.

In summation, none of the four hypotheses were supported. The positive relationship between long-term compensation structure and strategic change that was contended in Hypothesis 1 was not supported. Further, this relationship was not weakened by executive age (Hypothesis 2) or tenure (Hypothesis 3) nor was it strengthened by executive overconfidence (Hypothesis 4). Since none of the four hypotheses were supported, Hair and colleagues (2006) suggest conducting post-hoc

analysis to investigate the possibility that decisions made by the researcher may contribute to the unsupported hypotheses. Following this recommendation, post-hoc analysis was conducted. Additional information regarding post-hoc analysis is provided in the next section.

Post-hoc Analysis

As Hair and colleagues (2006) note, it is possible that choices made by researchers can contribute to unsupported hypotheses. This can occur in two ways: inclusion of control variables and measurement of variables. Both of these possibilities were explored in post-hoc analysis.

Variable Inclusion Decisions

Including control variables may bias estimates and thus contribute to unsupported hypotheses (Hair et al., 2006). This is because control variables are often identified from extant research even though it may not be possible to account for contextual effects from that research that are either unreported (e.g. alterations to model specification; details of sample data) or unrecognized (e.g. presence of unspecified additive or moderating effects; failure to alter models appropriately; failure to identify contextual effects of a sample). As a case in point, once a variable *X* is found to affect an outcome of interest *Y*, subsequent research often includes *X* as a control whenever assessing alternative relationships with *Y* (e.g. *Z* on *Y*; *W* on *Y*). However, if *X* is dependent on some contextual factor that was unreported or unrecognized in the original test, controlling for *X* in tests of other variables (e.g. *Z, W*) on *Y* may actually bias estimates (Hair et al., 2006). Including control variables, then, may bias estimates and contribute to unsupported hypotheses and it is important that researchers investigate this possibility.

A technique that is recommended when theoretically justified relationships are unsupported is backward elimination (Hair et al., 2006). Backward elimination starts with a 'full' regression model (i.e. a regression with all identified independent and control variables) and removes predictors that the researcher believes may be biasing estimates. This method is valuable in the context of unsupported hypotheses since it allows researchers to identify if estimates are sensitive to the removal of variables or if the theoretical arguments are unsupported even after accounting for this possibility. As such, backward elimination was conducted on each of the four dependent variables.

Backward Elimination

Backward elimination is a tool that can be utilized to identify if the inclusion of variables may be biasing estimates. Although this methodology can help researchers determine if estimates are sensitive to variable inclusion, it should be noted that backward elimination is a subjective technique. The subjective nature of backward elimination is worth noting for two reasons. First, there is not a statistical test that scholars can employ to identify which variables should be eliminated. Although there are rules of thumb (e.g. low correlation, insignificant estimates) that can be utilized to identify such variables, it is up to the researcher to provide rationale for their removal. Second, since it may not be possible to determine if prior research properly accounted for contextual effects of a variable, extant research may not be informative with respect to which variables to include or exclude from a model. Because of these limitations, scholars must exercise caution in using this technique to avoid 'data mining' or 'data fishing.' That is, while backward elimination may be of value, it should not be utilized to justify variable removal aimed at generating significant results only. Rather, rationale should be

provided for the removal of each variable and results should be interpreted accordingly. Following this recommendation, rationale is provided whenever a variable is removed from analysis.

Variable Removal

Because variable removal decisions are subjective (Hair et al., 2006), it is important that researchers provide rationale regarding why a variable was removed. This helps guard against the potential that variables are removed solely to generate significant results. As such, rationale is provided for the removal of each variable and results reported as variables are removed.

To facilitate the presentation of post-hoc results, three changes were made to post-hoc tests from hypotheses tests. First, because estimates were consistent across each of the three measures of firm performance (i.e. ROA, Industry Adjusted ROA, and TSR) and both measures of overconfidence (i.e. option- and stock-based), for parsimony, post-hoc analyses was estimated with ROA and option-based overconfidence only. If warranted by significant findings, subsequent analysis was conducted to determine if those findings are robust to different measures of firm performance and overconfidence, respectively. Second, because it is possible that moderating variables may be candidates for removal, this possibility was also investigated. To determine if findings are sensitive to the inclusion of moderating variables, twelve models were run for each dependent variable. This includes one model for each possible combination of the three moderators. Third, to aid in the presentation of results, only the coefficients are reported; standard errors are omitted from the results unless additional analysis is warranted.

Removing Diversification

The first variable that was identified for removal is diversification. Diversification was removed for three reasons. First, the measure of diversification that is utilized (entropy) has been employed as a measure of strategic change (e.g. Westphal & Bednar, 2005; Westphal & Fredrickson, 2001). As such, utilizing entropy to control for diversification may confound the actual relationship with the dependent variables utilized (e.g. Robins & Wiersema, 2003). Removing entropy from the model will eliminate this concern. Second, Hair and colleagues (2006) recommend removing variables that do not strongly relate to the variable of interest. Entropy is not highly correlated with any of the dependent variables ($r < .06$), and as a result is a candidate for removal. Third, diversification was already removed from analyses in which the three-year value of strategic variation was assessed and removing the variable from all models facilitates the comparison of results.

Post-hoc results after the removal of diversification are presented in Tables 15 through 18. Results are presented in the same order as hypotheses testing: one-year strategic variation (Table 15) followed by one-year strategic deviation (Table 16), three-year strategic deviation (Table 17) and three-year strategic variation (Table 18). Further, tests utilize the same analytic techniques that were used in hypothesis testing. Although diversification was previously omitted from tests on three-year strategic variation, possible combinations of the moderators were not tested since GMM typically includes all possible variables (Roodman, 2006). However, in post-hoc analysis, only one moderator is being tested per model. If a significant relationship is found, further testing was conducted to identify if the variable is robust to the inclusion of other moderators.

Table 15

Post-Hoc Analysis on One-Year Strategic Variation after Removing Diversification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	-0.217	-0.184	-0.107	-0.064	-0.200	-0.159	-0.045	-0.008	-0.299	-0.130	-0.198	-0.121
Prior One-Year Strategic Variation	0.032	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.032	0.032	0.033	0.033
Size	**-0.176**	**-0.181**	**-0.179**	**-0.184**	**-0.179**	**-0.184**	**-0.179**	**-0.184**	**-0.176**	**-0.176**	**-0.179**	**-0.178**
Unabsorbed Slack	0.029	0.029	0.028	0.028	0.029	0.029	0.029	0.029	0.029	0.029	0.028	0.029
ROA	**-0.951**	**-0.959**	**-0.953**	**-0.962**	**-0.952**	**-0.961**	**-0.955**	**-0.964**	**-0.949**	**-0.952**	**-0.951**	**-0.952**
BOD Composition	0.138	0.137	0.117	0.114	0.136	0.134	0.137	0.136	0.136	0.138	0.115	0.121
BOD Independence	-0.009	-0.009	-0.009	-0.009	-0.013	-0.013	-0.008	-0.008	-0.009	-0.003	-0.010	-0.006
CEO Duality	**0.154**	**0.155**	**0.142**	**0.141**	**0.155**	**0.155**	**0.161**	**0.161**	**0.155**	**0.162**	**0.141**	**0.149**
Blockholder Ownership	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CEO Ownership	0.000	0.000	-0.001	-0.001	0.000	0.000	0.000	0.000	0.000	-0.001	-0.001	-0.001
Annual Compensation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Long-Term Compensation Structure	-0.155	-0.143	-0.172	-0.161	-0.107	-0.106	-0.111	-0.110	0.014	0.012	0.019	0.016
Age	0.002	0.002	0.000	0.000	0.003	0.003			0.003		0.002	
Tenure	-0.005	-0.005			-0.012	-0.012	-0.011	-0.011	-0.005	-0.003		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
LTCS x Age	0.003	0.003	0.003	0.003								
LTCS x Tenure					0.017	0.017	0.018	0.017				
LTCS x Options									0.000	0.000	0.000	0.000
F	**2.386**	**2.421**	**2.485**	**2.527**	**2.403**	**2.428**	**2.504**	**2.534**	**2.368**	**2.467**	**2.468**	**2.578**
R^2	0.017	0.017	0.016	0.016	0.017	0.017	0.017	0.017	0.017	0.016	0.016	0.016

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the .05 level.

Table 16

Post-Hoc Analysis on One-Year Strategic Deviation after Removing Diversification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	-2.820	-1.415	-9.996	-8.559	187.739	189.931	132.495	134.742	**208.480**	151.114	**197.406**	151.415
Prior One-Year Strategic Deviation	**-0.091**	**-0.091**	**-0.091**	**-0.091**	**-0.091**	**-0.091**	**-0.091**	**-0.091**	**-0.090**	**-0.090**	**-0.090**	**-0.090**
Size	-11.307	-11.515	-11.122	-11.308	-11.334	-11.622	-11.336	-11.651	-12.110	-12.134	-11.798	-12.206
Unabsorbed Slack	-3.769	-3.770	-3.750	-3.751	-3.899	-3.900	-3.960	-3.962	-3.815	-3.878	-3.782	-3.888
ROA	38.450	38.093	38.668	38.353	33.557	33.058	34.555	34.011	32.031	33.035	32.371	32.997
BOD Composition	-10.384	-10.469	-9.029	-9.144	-6.083	-6.194	-6.680	-6.803	-7.038	-7.697	-4.693	-8.256
BOD Independence	1.549	1.552	1.585	1.587	2.450	2.459	0.383	0.388	1.039	-1.171	1.103	-1.271
CEO Duality	17.851	17.854	18.720	18.696	17.508	17.511	15.195	15.192	17.357	14.926	18.842	14.495
Blockholder Ownership	0.018	0.018	0.016	0.016	0.013	0.012	0.008	0.008	0.030	0.026	0.028	0.027
CEO Ownership	-0.636	-0.635	-0.589	-0.589	-1.002	-1.001	-0.889	-0.887	-0.923	-0.803	-0.845	-0.816
Annual Compensation	-0.005	-0.006	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Long-Term Compensation Structure	**400.805**	**401.252**	**401.939**	**402.290**	-0.916	-0.865	0.520	0.580	-23.810	-22.905	-24.319	-22.754
Age	2.582	2.584	2.711	2.709	-1.123	-1.126			-1.176		-0.977	
Tenure	0.306	0.295			2.170	2.165	1.624	1.616	0.523	-0.095		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
LTCS x Age	**-7.809**	**-7.818**	**-7.835**	**-7.842**								
LTCS x Tenure					-3.781	-3.801	-3.879	-3.901				
LTCS x Options									0.000	0.000	0.000	0.000
F	**2.976**	**3.070**	**3.056**	**3.152**	**2.981**	**3.081**	**3.116**	**3.227**	**2.933**	**3.065**	**3.012**	**3.149**
R^2	0.021	0.021	0.021	0.021	0.018	0.018	0.018	0.018	0.017	0.017	0.017	0.017

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the .05 level.

Table 17

Post-Hoc Analysis on Three-Year Strategic Deviation after Removing Diversification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	92.155	100.572	89.868	99.480	61.749	69.794	91.733	98.822	74.238	101.970	72.381	100.918
Prior Three-Year Strategic Deviation	**-0.108**	**-0.109**	**-0.108**	**-0.109**	**-0.108**	**-0.109**	**-0.108**	**-0.109**	**-0.108**	**-0.109**	**-0.108**	**-0.109**
Size	1.428	0.383	1.482	0.412	1.689	0.729	1.833	0.890	1.496	1.637	1.543	1.919
Unabsorbed Slack	-5.710	-5.780	-5.700	-5.775	-5.664	-5.731	-5.637	-5.703	-5.622	-5.596	-5.613	-5.545
ROA	16.809	15.265	16.931	15.327	17.844	16.411	17.264	15.878	18.763	18.244	18.865	18.612
BOD Composition	-97.587	-98.557	-97.082	-98.319	-96.404	-97.234	-96.022	-96.844	-96.612	-96.212	-96.169	-93.823
BOD Independence	-64.829	-64.859	-64.844	-64.867	-64.338	-64.341	-63.457	-63.483	-63.102	-62.254	-63.115	-62.062
CEO Duality	0.988	0.974	1.296	1.117	1.098	1.086	2.411	2.365	1.250	2.478	1.517	4.220
Blockholder Ownership	0.050	0.050	0.050	0.050	0.043	0.042	0.044	0.043	0.044	0.044	0.044	0.044
CEO Ownership	0.901	0.912	0.913	0.918	0.886	0.894	0.841	0.850	0.920	0.878	0.931	0.920
Annual Compensation	-0.009	-0.010	-0.009	-0.010	-0.009	-0.010	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
Long-Term Compensation Structure	-37.931	-36.887	-37.693	-36.781	16.099	16.200	15.163	15.286	-3.284	-3.898	-3.356	-4.453
Age	0.251	0.244	0.294	0.264	0.627	0.610			0.584		0.619	
Tenure	0.109	0.050			0.990	0.968	1.290	1.260	0.095	0.394		
Option-based Overconfidence	0.000		0.000		0.000		0.000		-0.001	-0.001	-0.001	-0.001
LTCS x Age	0.733	0.706	0.727	0.703								
LTCS x Tenure					-2.025	-2.097	-1.979	-2.050				
LTCS x Options									0.001	0.001	0.001	0.001
F	**3.483**	**3.399**	**3.640**	**3.565**	**3.460**	**3.416**	**3.594**	**3.584**	**3.455**	**3.608**	**3.617**	**3.796**
R^2	0.021	0.021	0.021	0.021	0.022	0.021	0.022	0.021	0.022	0.022	0.022	0.022

All models include 4,715 firm-year observations across 731 firms. Bold coefficients are significant at the .05 level.

Table 18

Post-Hoc Analysis on Three-Year Strategic Variation after Removing Diversification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Prior Three-Year Strategic Variation	**-0.102**	**-0.102**	**-0.101**	-0.101	**-0.105**	**-0.105**	**-0.102**	**-0.101**	**-0.103**	**-0.100**	**-0.102**	**-0.100**
Size	-0.028	-0.021	-0.038	-0.031	-0.016	-0.010	-0.030	-0.023	-0.024	-0.038	-0.033	-0.038
Unabsorbed Slack	-0.020	-0.021	-0.020	-0.021	-0.020	-0.021	-0.019	-0.020	-0.020	-0.019	-0.020	-0.020
ROA	**-1.025**	**-1.025**	**-1.033**	**-1.034**	**-1.016**	**-1.017**	**-1.022**	**-1.023**	**-1.027**	**-1.034**	**-1.036**	**-1.037**
BOD Composition	0.938	0.947	0.951	0.961	0.996	1.004	0.991	0.999	0.967	0.961	0.980	0.971
BOD Independence	-0.279	-0.277	-0.267	-0.266	-0.249	-0.249	-0.240	-0.239	-0.260	-0.250	-0.249	-0.247
CEO Duality	0.108	0.106	0.115	0.113	0.111	0.109	0.100	0.098	0.104	0.092	0.111	0.101
Blockholder Ownership	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
CEO Ownership	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Annual Compensation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Long-Term Compensation Structure	0.631	0.617	0.623	0.609	0.022	0.019	0.027	0.025	-0.074	-0.071	-0.076	-0.074
Age	-0.001	-0.002	0.003	0.003	-0.006	-0.006			-0.006		-0.002	
Tenure	0.006	0.006			0.010	0.010	0.007	0.007	0.006	0.002		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
LTCS x Age	-0.013	-0.012	-0.013	-0.012								
LTCS x Tenure					-0.013	-0.013	-0.013	-0.013				
LTCS x Options									0.000	0.000	0.000	0.000
Chi^2	33.47	31.82	**33.29**	**31.66**	**34.22**	**32.68**	**33.95**	**32.43**	33.00	**32.73**	**32.83**	**32.61**
AR(1)	**-8.818**	**-8.822**	**-8.800**	**-8.803**	**-8.788**	**-8.792**	**-8.780**	**-8.784**	**-8.790**	**-8.781**	**-8.772**	**-8.772**
AR(2)	**-3.891**	**-3.894**	**-3.858**	**-3.861**	**-3.886**	**-3.889**	**-3.848**	**-3.850**	**-3.860**	**-3.818**	**-3.827**	**-3.824**
Hansen's J	388.02	398.86	398.91	398.34	402.16	401.97	402.57	402.30	398.91	399.66	398.95	399.49

All models include 3,866 firm-year observations across 714 firms. Bold coefficients are significant at the .05 level.

Results after Removing Diversification

Results from post-hoc analysis after removing diversification were consistent with the results found from hypotheses testing. First, all tests exhibited appropriate fit ($F <$ .05 value in Tables 15, 16 and 17; $Chi^2 <$ .05 in Table 18), which indicates that they can be used to assess the hypothesized relationships (Hair et al., 2006). Second, the only relationships that were found to be supported were Hypotheses 1 and 2. However, these relationships were significant when one-year strategic deviation was utilized as the dependent variable only. This finding is indicated by the significant coefficients on the variables *Long-term Compensation Structure* and *LTCS x Age* when one-year strategic deviation is the dependent variable (i.e. Table 16, Models 1 through 4) and non-significant coefficients on all other hypothesized variables (i.e. *LTCS x Tenure, LTCS x Options, and LTCS x Stocks*) across all dependent variables.

Since Hypotheses 1 and 2 were supported only when one-year strategic deviation was used as the dependent variable but not when other measures of strategic change were used as the dependent variable, these hypotheses cannot be supported. This is because when a relationship exists in the context of a specific measure of a construct only but not with other measures of the construct (here, strategic change), we cannot contend that the relationship exists since it is not robust to various measures (Hair et al., 2006). Because Hypotheses 1 and 2 are significant only when one-year strategic deviation is the dependent variable, they cannot be supported since they are not robust to other measures of strategic change. Further, Hypotheses 3 and 4 are not significantly related to strategic change in any of the analyses. This finding suggests that these two hypotheses are not supported.

Adjusting the Sampling Time-Frame

A second post-hoc adjustment was assessed to identify whether the inclusion of time-periods may have contributed to unsupported hypotheses. This can occur if 'events' within the sampling timeframe (1996 through 2006) affect the occurrence of strategic change. Including sampling frames in which the occurrence of the dependent variable is either abnormally limited or expanded may lead to biased estimates (Hair et al., 2006; Whitley, 2001). This is because the relationships will be artificially weakened or strengthened, respectively, in correspondence with the abnormal occurrence of the dependent variable. This is similar to contemporaneous correlation, which exists when error terms are correlated within a time period due to a unique event within a time period (Beck & Katz, 1995). However, contemporaneous correlation does not account for unique events that may exist across time periods. So while the addition of time dummies may account for contemporaneous correlation due to events in specific time periods that affected strategic change (e.g. economic conditions, governmental regulation; Porter, 1980), time dummies will not account for effects of events that are sustained across time periods. If an event occurred that was sustained over more than one time period (i.e. years, in this study) and that event affected the occurrence of the dependent variable, this has the potential to bias estimates since this effect is not being factored into calculations of those estimates.

One event that may have affected the occurrence of the dependent variable was the tragedies of September 11, 2001. Economic and political uncertainty (including engaging in subsequent wars in Afghanistan and Iraq) that followed this event may have impacted the willingness of firms to change strategies over a sustained period of time. To

account for this possibility, analysis was re-run on the years 1996 through 2000 only. The earlier years were chosen because research has yet to determine the extent to which the September 11, 2001 attacks and subsequent economic and political uncertainty affected firms. To avoid the potential that economic and political uncertainty in the years immediately following September 11, 2001 confounds estimation of relationships during this time-frame, the earlier time frame (i.e. 1996 to 2000) was utilized. Further, because similar time-frames have been used by other scholars to investigate strategic change (e.g. Carpenter, 2000; Chatterjee & Hambrick, 2007; Zhang & Rajagopalan; 2003; 2009) these results may be more comparable to the extant literature.

For consistency and parsimony, the same post-hoc analytic procedures were employed as were used with models in which diversification was removed: models are estimated with ROA and option-based overconfidence only and subsequent analysis was conducted if significant relationships are found to determine if the relationships are robust to alternative measures. Further, to identify if the relationships are sensitive to the inclusion of the moderating variables, one model was run for each possible combination of these variables. Only the coefficients are reported from this analysis unless additional tests are warranted.

Presentations of these results follow the same methodology as the previous post-hoc analysis, as do the analytic techniques employed. Tests on one-year strategic variation are displayed in Table 19 followed by one-year strategic deviation (Table 20), three-year strategic deviation (Table 21), and three-year strategic variation (Table 22). The results of these analyses are presented next.

Table 19

Post-Hoc Analysis on One-Year Strategic Variation from 1996 to 2000.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	0.086	0.036	0.430	0.392	0.641	0.601	1.177	1.138	0.403	0.963	0.745	0.990
Prior One-Year Strategic Variation	**-0.109**	**-0.110**	**-0.109**	**-0.109**	**-0.107**	**-0.107**	**-0.107**	**-0.107**	**-0.108**	**-0.109**	**-0.108**	**-0.108**
Size	-0.341	-0.333	-0.347	**-0.342**	-0.345	**-0.338**	-0.336	-0.330	-0.340	-0.331	-0.346	-0.340
Unabsorbed Slack	-0.003	-0.003	-0.006	-0.006	-0.007	-0.007	-0.011	-0.011	-0.002	-0.006	-0.006	-0.007
ROA	-0.243	-0.234	-0.241	-0.235	-0.227	-0.219	-0.250	-0.242	-0.240	-0.263	-0.238	-0.252
BOD Composition	0.750	0.754	0.684	0.687	0.683	0.687	0.676	0.679	0.757	0.751	0.691	0.701
BOD Independence	-0.362	-0.365	-0.355	-0.357	-0.369	-0.371	-0.335	-0.337	-0.357	-0.320	-0.349	-0.330
CEO Duality	**0.289**	**0.290**	**0.243**	**0.244**	**0.291**	**0.292**	**0.323**	**0.323**	**0.287**	**0.320**	**0.241**	**0.269**
Blockholder Ownership	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
CEO Ownership	-0.011	-0.011	-0.013	-0.013	-0.010	-0.010	-0.010	-0.010	-0.011	-0.011	-0.013	-0.013
Annual Compensation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Long-Term Compensation Structure	0.619	0.631	0.625	0.634	**-0.396**	**-0.394**	**-0.412**	**-0.411**	-0.126	-0.141	-0.113	-0.124
Age	0.019	0.019	0.012	0.012	0.012	0.012			0.013		0.006	
Tenure	-0.020	-0.020			**-0.038**	**-0.037**	**-0.031**	**-0.031**	-0.020	-0.013		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
LTCS x Age	-0.014	-0.014	-0.013	-0.013								
LTCS x Tenure					**0.040**	**0.040**	**0.041**	**0.041**				
LTCS x Options									0.000	0.000	0.000	0.000
F	**3.145**	**3.313**	**3.214**	**3.397**	**3.216**	**3.387**	**3.281**	**3.471**	**3.012**	**3.047**	**3.063**	**3.200**
R^2	0.041	0.041	0.039	0.039	0.043	0.043	0.042	0.042	0.041	0.040	0.039	0.039

All models include 2,218 firm-year observations across 604 firms. Bold coefficients are significant at the $p < .05$ level.

Table 20

Post-Hoc Analysis on One-Year Strategic Deviation from 1996 to 2000.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	267.681	247.375	261.927	239.112	**647.925**	**626.859**	**583.883**	**559.175**	**627.086**	**570.941**	**623.312**	**571.867**
Prior One-Year Strategic Deviation	**-0.264**	**-0.263**	**-0.264**	**-0.263**	**-0.263**	**-0.263**	**-0.263**	**-0.262**	**-0.264**	**-0.263**	**-0.264**	**-0.263**
Size	**-64.924**	**-62.015**	**-64.836**	**-61.843**	**-64.075**	**-60.716**	**-65.279**	**-61.859**	**-62.875**	**-63.913**	**-62.815**	**-64.253**
Unabsorbed Slack	18.116	18.010	18.164	18.074	18.547	18.419	18.839	18.719	18.453	18.701	18.484	18.658
ROA	40.492	44.668	40.481	44.727	41.066	45.906	43.960	49.100	39.406	41.917	39.395	42.367
BOD Composition	-132.04	-130.08	-130.93	-128.52	-123.09	-120.95	-122.50	-120.26	-126.72	-126.40	-126.002	-128.32
BOD Independence	-98.687	-99.901	-98.833	-100.122	-92.188	-93.576	-96.330	-97.954	-98.258	-102.021	-98.366	-102.355
CEO Duality	26.862	27.276	27.671	28.396	24.791	25.266	21.016	21.336	23.738	20.414	24.266	18.409
Blockholder Ownership	-0.166	-0.162	-0.165	-0.160	-0.231	-0.226	-0.225	-0.220	-0.218	-0.212	-0.217	-0.213
CEO Ownership	-3.271	-3.297	-3.238	-3.251	-3.234	-3.260	-3.207	-3.233	-3.189	-3.162	-3.167	-3.218
Annual Compensation	-0.008	-0.007	-0.008	-0.007	-0.009	-0.007	-0.009	-0.008	-0.010	-0.010	-0.009	-0.010
Long-Term Compensation Structure	853.930	858.922	853.825	858.865	-45.910	-45.226	-43.929	-43.132	-27.446	-25.835	-27.585	-25.186
Age	5.568	5.542	5.691	5.711	-1.492	-1.558			-1.310		-1.230	
Tenure	0.344	0.471			0.446	0.548	-0.339	-0.268	0.226	-0.498		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.002	0.002	0.002	0.002
LTCS x Age	-16.361	-16.431	-16.364	-16.436								
LTCS x Tenure					-0.071	0.027	-0.155	-0.057				
LTCS x Options									-0.002	-0.002	-0.002	-0.002
F	**15.027**	**13.859**	**15.798**	**14.677**	**17.375**	**16.094**	**18.343**	**17.014**	**16.917**	**17.963**	**17.810**	**18.960**
R2	0.081	0.081	0.081	0.081	0.067	0.067	0.067	0.066	0.069	0.069	0.069	0.069

All models include 2,218 firm-year observations across 604 firms. Bold coefficients are significant at the $p < .05$ level.

Table 21

Post-Hoc Analysis on Three-Year Strategic Deviation from 1996 to 2000.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	55.680	36.389	79.688	59.574	-88.548	-105.03	-27.150	-45.021	-76.093	-17.886	-52.553	-16.688
Prior Three-Year Strategic Deviation	**-0.135**	**-0.134**	**-0.135**	**-0.134**	**-0.135**	**-0.135**	**-0.136**	**-0.135**	**-0.135**	**-0.136**	**-0.135**	**-0.136**
Size	10.837	13.575	10.470	13.097	10.351	12.948	11.453	13.911	9.881	10.905	9.501	10.460
Unabsorbed Slack	-0.978	-1.065	-1.176	-1.244	-1.059	-1.146	-1.346	-1.420	-1.125	-1.389	-1.319	-1.446
ROA	-7.890	-4.106	-7.765	-4.180	-6.905	-3.322	-8.842	-5.335	-6.205	-8.000	-6.049	-7.519
BOD Composition	-53.380	-51.407	-57.870	-55.661	-54.158	-52.391	-54.805	-53.086	-54.940	-55.318	-59.305	-57.802
BOD Independence	9.355	8.347	9.811	8.820	7.727	6.769	11.359	10.318	9.064	12.652	9.582	12.178
CEO Duality	-21.100	-20.684	-24.509	-23.860	-20.417	-20.027	-16.908	-16.649	-20.027	-16.679	-23.356	-19.363
Blockholder Ownership	-0.311	-0.307	-0.316	-0.312	-0.289	-0.286	-0.295	-0.291	-0.292	-0.297	-0.297	-0.299
CEO Ownership	1.462	1.440	1.325	1.314	1.410	1.391	1.385	1.368	1.433	1.405	1.297	1.332
Annual Compensation	-0.004	-0.003	-0.004	-0.003	-0.004	-0.003	-0.003	-0.002	-0.003	-0.003	-0.003	-0.003
Long-Term Compensation Structure	-310.82	-306.16	-310.47	-306.07	26.574	27.138	24.486	25.098	14.007	12.236	14.886	13.137
Age	-1.190	-1.213	-1.700	-1.684	1.416	1.367			1.345		0.848	
Tenure	-1.408	-1.297			-0.976	-0.903	-0.253	-0.208	-1.384	-0.655		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
LTCS x Age	6.001	5.937	6.016	5.954								
LTCS x Tenure					-1.024	-0.951	-0.931	-0.863				
LTCS x Options									0.001	0.001	0.001	0.001
F	**2.920**	**3.019**	**2.910**	**3.023**	**2.849**	**2.941**	**2.994**	**3.097**	**2.920**	**3.075**	**2.921**	**3.099**
R^2	0.034	0.033	0.034	0.033	0.031	0.031	0.031	0.030	0.031	0.031	0.031	0.031

All models include 2,205 firm-year observations across 599 firms. Bold coefficients are significant at the $p < .05$ level.

Table 22

Post-Hoc Analysis on Three-Year Strategic Variation from 1996 to 2000.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Prior Three-Year Strategic Variation	-0.102	-0.102	-0.102	-0.102	-0.106	-0.106	-0.108	-0.108	-0.104	-0.106	-0.105	-0.107
Size	0.009	0.012	0.019	0.021	0.023	0.026	0.055	0.057	0.009	0.039	0.020	0.038
Unabsorbed Slack	-0.072	-0.074	-0.071	-0.073	-0.066	-0.068	-0.067	-0.069	-0.080	-0.082	-0.079	-0.083
ROA	**-2.220**	**-2.222**	**-2.218**	**-2.220**	**-2.173**	**-2.176**	**-2.156**	**-2.159**	**-2.222**	**-2.205**	**-2.220**	**-2.202**
BOD Composition	0.593	0.580	0.591	0.577	0.681	0.663	0.682	0.664	0.641	0.643	0.639	0.645
BOD Independence	-0.877	-0.875	-0.877	-0.875	-0.863	-0.860	-0.853	-0.850	-0.871	-0.861	-0.871	-0.859
CEO Duality	0.018	0.022	0.017	0.021	0.016	0.020	0.028	0.032	0.015	0.027	0.014	0.031
Blockholder Ownership	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001
CEO Ownership	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
Annual Compensation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Long-Term Compensation Structure	0.713	0.731	0.722	0.739	0.013	0.011	0.012	0.009	-0.088	-0.092	-0.087	-0.094
Age	0.011	0.011	0.009	0.009	0.007	0.007			0.007		0.004	
Tenure	-0.003	-0.002			0.001	0.001	0.005	0.006	-0.003	0.001		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
LTCS x Age	-0.014	-0.015	-0.015	-0.015								
LTCS x Tenure					-0.014	-0.014	-0.014	-0.014				
LTCS x Options									0.000	0.000	0.000	0.000
Chi^2	22.95	22.89	22.67	22.59	24.48	24.39	23.37	23.27	23.20	22.34	22.91	22.32
AR(1)	**-6.147**	**-6.156**	**-6.138**	**-6.147**	**-6.111**	**-6.119**	**-6.108**	**-6.116**	**-6.110**	**-6.108**	**-6.104**	**-6.101**
AR(2)	**-2.283**	**-2.284**	**-2.293**	**-2.294**	**-2.287**	**-2.289**	**-2.306**	**-2.307**	**-2.277**	**-2.295**	**-2.289**	**-2.286**
Hansen's J	136.81	136.73	136.66	136.59	137.35	137.32	138.64	138.62	136.91	137.86	136.78	138.24

All models include 1,542 firm-year observations across 528 firms. Bold coefficients are significant at the $p < .05$ level.

Results after Adjusting the Sampling Time-Frame

Post-hoc tests after removing data from the time-frame later than 2000 exhibited appropriate fit on tests using fixed effects regression ($F < .05$ value in Tables 19, 20 and 22). However, tests using GMM did not exhibit appropriate fit ($Chi^2 > .05$ in Table 22). These findings indicate that the tests using fixed effects regression can be used to assess the hypothesized relationships but that the GMM tests should not be analyzed since the models do not exhibit appropriate fit (Hair et al., 2006). This is because the variables included do not significantly affect the dependent variable of three-year strategic variation when considered jointly. As such, the model is not valid for determining if individual variables affect the dependent variable (Hair et al., 2006).

Results suggest that none of the four hypothesized relationships are supported. As with previous analyses, two hypothesized relationships were significantly related to one of the four dependent variables only while the other two hypotheses were not supported in any of the tests. As opposed to previous tests in which Hypotheses 1 and 2 were significant on one of the dependent variables, after removing data from the years 2001 through 2006, coefficients on the variables corresponding to Hypothesis 1 (i.e. *Long-term Compensation Structure*) and Hypothesis 3 (i.e. *LTCS x Tenure*) were found to significantly relate to one of the dependent variables only. In this case, long-term compensation structure was found to significantly affect one-year strategic variation and this relationship was significantly moderated by executive tenure (Table 19, Models 5 through 8). The direction of the relationships were opposite of what was contended, however. As such, the hypothesized relationships cannot be supported since they were not in the direction that was contended. Rather than positively affecting this relationship,

it was found that long-term compensation structure was negatively related to one-year strategic variation. Similarly, Hypotheses 3 argued that executive tenure would weaken the relationship between long-term compensation structure and strategic change. However, the results of post-hoc analysis suggest that tenure significantly strengthens this relationship, as is indicated by the positive coefficient on the interaction term of *LTCS x Tenure*. Because these relationships were opposite of what was contended, the hypotheses are not supported. Additionally, since this relationship was not robust to other conceptualizations of strategic change (i.e. one- and three-year strategic deviation, three-year strategic variation) this finding should be viewed with caution. Neither Hypotheses 2 nor 4 were supported in any of the post-hoc analyses that utilized the 1996 through 2000 time-frame. This is indicated by the lack of significant coefficients for *LTCS x Age* (i.e. Hypothesis 2) and *LTCS x Options* (i.e. Hypothesis 4). Cumulatively, these findings suggest that the hypothesized relationships are not affected by including the post-September 11, 2001 time-frame in the analysis.

Conclusion of Backward Elimination

Backward elimination was conducted to account for the possibility that the inclusion of variables may bias estimates and contribute to unsupported hypotheses (Hair et al., 2006). While backward elimination can help researchers identify if estimates are sensitive to variable selection, caution must be exercised to avoid removing variables in perpetuity until significant results are generated. Rather, scholars should provide rationale for the elimination of each variable. Of the variables remaining, none were deemed as having sufficient rationale for removal. This is because each variable has received support across multiple investigations of strategic change, a fact which reduces

the concern that scholars did not account for contextual specific effects of these variables. That is, because each of the remaining variables have demonstrated consistent relationships with strategic change across a number of diverse samples, there is less concern that sample-specific characteristics may have biased estimates (Hair et al., 2006). As such, backward elimination was concluded after removing diversification and altering the sampling time-frame, respectively.

Measurement of Variables

Hair and colleagues (2006) identified two categories of choices made by researchers that can contribute to unsupported hypotheses: inclusion of control variables and measurement of variables. The inclusion of control variables was addressed in the previous section. In this section, measurement decisions made in this study are analyzed to determine if these choices may have contributed to unsupported hypotheses.

Measurement decisions made by researchers may contribute to unsupported hypotheses because the use of a particular measure can bias estimates (Hair et al., 2006). This can occur if measures either lack validity (e.g. Boyd, Gove & Hitt, 2005; Venkatraman & Grant, 1986) or are not comparable across groups in a sample (Hair et al., 2006; Vandenberg & Lance, 2000). Five concerns with respect to the validity of measures have been previous addressed in this chapter. These included:

1. Capturing strategic change relative to different referents (i.e. strategic variation and strategic deviation; Carpenter, 2000).
2. Assessing strategic change over two time intervals (i.e. one-year and three-years) to account for the fact that there is not an agreed upon time interval during which strategic change can or should occur (Westphal et al., 2001).
3. Employing two measures of executive overconfidence (i.e. option-based and stock-based) to address concerns with respect to the validity of extant measures (Hiller & Hambrick, 2005).

4. Testing whether relationships are robust to three different measures of firm performance (i.e. ROA, Industry Adjusted ROA, and TSR) since single measures of performance may lack validity (e.g. Venkatraman & Ramanujam, 1986).
5. Removing diversification because no extant measure is without limitations (e.g. Robins & Wiersema, 2003).

Although concerns with respect to the validity of measures have been addressed previously in this chapter, the possibility that measures are not comparable across groups within the sample has not been addressed. If measures are not comparable across groups, estimates of any relationships can be biased (Hair et al., 2006; Vandenberg & Lance, 2000). For instance, if a researcher was interested in assessing the impact of workers' life satisfaction (Diener, 1984) on various work outcomes (e.g. job performance, job satisfaction, absenteeism, turnover intentions) but the measure of life satisfaction was not invariant across different groups within the sample (e.g. gender, cultures, religions), then it is possible that group affiliation is biasing the estimates (e.g. gender, Shevlin, Brunsden, & Miles, 1998; cultures, Dorahy, Schumaker, Simpson, & Deshpande, 1996; religions, Dorahy, Lewis, Schumaker, Akuamoah-Boateng, Duze, & Sibiya, 1998).

A group membership that is present in this study is the industry in which each firm operates. Because different practices can exist across industries (Hrebiniak & Snow, 1980; Porter, 1980), it is possible that different practices with respect to the payment of executives exist across industries as well. One way to account for differences that exist across industries is to standardize affected measures to industry membership (e.g. Datta & Rajagopalan, 1998; Finkelstein & Hambrick, 1990; Zhang, 2006). This helps account for differences that exist across industries and makes the measures more comparable across them. As such,

to determine if differences exist across industry with respect to the long-term compensation structure of executives, this variable was adjusted to each firm's primary industry (as determine by 4-digit SIC code).

Following this adjustment, additional post-hoc analyses were conducted using *Industry Adjusted Long-term Compensation Structure (LTCS)* in lieu of *Long-term Compensation Structure*. Similarly, this adjustment was also made to all interaction variables created with long-term compensation structure, resulting in the following variables: *Industry Adjusted LTCS x Age, Industry Adjusted LTCS x Tenure, Industry Adjusted LTCS x Options* and *Industry Adjusted LTCS x Stocks*. To remain consistent with prior analysis, analytic procedures followed those used with previous post-hoc analysis. All models were tested with ROA and option-based overconfidence only. To identify if relationships are robust to the inclusion of moderating variables, one model was run for each possible combination of moderators. Because diversification may be confounded with the measures of strategic change, diversification was dropped from all tests. Since removing the time frame after 2000 did not impact results, tests were conducted using all years of data (i.e. 1996 to 2006). For parsimony, only the coefficients are reported from this analysis unless additional tests are warranted.

Post-hoc analysis adjusting long-term compensation for industry follows the same procedures as previous post-hoc analysis and utilizes the same analytic techniques as well. Tests on one-year strategic variation are displayed first (Table 23) followed by one-year strategic deviation (Table 24), three-year strategic deviation (Table 25) and three-year strategic variation (Table 26). The results of all tests are discussed after the presentation of the tables.

Table 23

Post Hoc Analysis with Industry Adjusted Long-term Compensation Structure on One-Year Strategic Variation

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	-0.303	-0.265	-0.199	-0.151	-0.301	-0.263	-0.141	-0.106	-0.303	-0.139	-0.199	-0.128
Prior One-Year Strategic Variation	0.032	0.033	0.033	0.033	0.032	0.033	0.033	0.033	0.032	0.032	0.033	0.033
Size	-0.174	**-0.179**	**-0.177**	**-0.182**	-0.173	**-0.178**	-0.173	**-0.178**	-0.174	-0.174	**-0.176**	**-0.176**
Unabsorbed Slack	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029
ROA	**-0.947**	**-0.955**	**-0.950**	**-0.959**	**-0.949**	**-0.957**	**-0.952**	**-0.960**	**-0.949**	**-0.952**	**-0.951**	**-0.952**
BOD Composition	0.136	0.135	0.114	0.111	0.136	0.135	0.138	0.137	0.135	0.136	0.112	0.118
BOD Independence	-0.005	-0.005	-0.006	-0.006	-0.005	-0.005	0.001	0.001	-0.005	0.001	-0.006	-0.003
CEO Duality	**0.155**	**0.155**	**0.141**	**0.141**	**0.155**	**0.155**	**0.162**	**0.161**	**0.155**	**0.162**	**0.141**	**0.148**
Blockholder Ownership	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CEO Ownership	0.000	0.000	-0.001	-0.001	0.000	0.000	-0.001	-0.001	0.000	-0.001	-0.001	-0.001
Annual Compensation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Industry Adjusted Long-Term Compensation Structure	0.023	0.024	0.023	0.025	-0.019	-0.020	-0.020	-0.020	-0.007	-0.007	-0.007	-0.007
Age	0.003	0.003	0.002	0.001	0.003	0.003			0.003		0.001	
Tenure	-0.005	-0.005			-0.005	-0.005	-0.003	-0.003	-0.005	-0.003		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
Industry Adjusted LTCS x Age	-0.001	-0.001	-0.001	-0.001								
Industry Adjusted LTCS x Tenure					0.001	0.001	0.001	0.001				
Industry Adjusted LTCS x Options									0.000	0.000	0.000	0.000
F	**2.454**	**2.462**	**2.559**	**2.573**	**2.467**	**2.486**	**2.568**	**2.592**	**2.437**	**2.539**	**2.539**	**2.653**
R^2	0.017	0.017	0.017	0.016	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the $p < .05$ level.

Table 24

Post Hoc Analysis with Industry Adjusted Long-term Compensation Structure on One-Year Strategic Deviation

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	**203.461**	**206.839**	**189.807**	**193.137**	**202.824**	**206.557**	147.564	151.276	**203.293**	147.96	**189.849**	147.875
Prior One-Year Strategic Deviation	**-0.090**	**-0.090**	**-0.090**	**-0.090**	**-0.090**	**-0.091**	**-0.090**	**-0.090**	**-0.090**	**-0.090**	**-0.090**	**-0.090**
Size	-13.541	-13.978	-13.196	-13.586	-13.335	-13.818	-13.319	-13.832	-13.335	-13.310	-12.995	-13.292
Unabsorbed Slack	-3.936	-3.938	-3.898	-3.901	-3.882	-3.884	-3.944	-3.946	-3.878	-3.935	-3.841	-3.932
ROA	34.173	33.436	34.602	33.949	33.061	32.241	34.048	33.182	32.910	33.870	33.333	33.882
BOD Composition	-6.327	-6.491	-3.435	-3.661	-4.938	-5.113	-5.559	-5.748	-5.663	-6.313	-2.826	-6.154
BOD Independence	1.640	1.644	1.696	1.698	1.465	1.468	-0.628	-0.633	1.374	-0.722	1.429	-0.696
CEO Duality	17.339	17.343	19.154	19.105	17.325	17.329	14.987	14.981	17.275	14.930	19.062	15.052
Blockholder Ownership	0.047	0.047	0.044	0.043	0.037	0.037	0.033	0.033	0.039	0.035	0.036	0.035
CEO Ownership	-0.849	-0.847	-0.752	-0.753	-0.920	-0.917	-0.803	-0.800	-0.920	-0.804	-0.824	-0.800
Annual Compensation	-0.004	-0.005	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Industry Adjusted Long-Term Compensation Structure	34.931	35.087	34.867	35.005	-1.614	-1.610	-1.332	-1.326	**-2.139**	**-2.100**	**-2.149**	**-2.101**
Age	-1.125	-1.129	-0.879	-0.890	-1.135	-1.140			-1.136		-0.893	
Tenure	0.637	0.616			0.633	0.609	0.034	0.006	0.627	0.027		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
Industry Adjusted LTCS x Age	-0.636	-0.638	-0.635	-0.637								
Industry Adjusted LTCS x Tenure					-0.040	-0.041	-0.054	-0.055				
Industry Adjusted LTCS x Options									0.000	0.000	0.000	0.000
F	**2.992**	**3.090**	**3.073**	**3.175**	**3.140**	**3.248**	**3.271**	**3.392**	**3.110**	**3.246**	**3.207**	**3.349**
R^2	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017

All models include 4,807 firm-year observations across 772 firms. Bold coefficients are significant at the $p < .05$ level.

Table 25

Post Hoc Analysis with Industry Adjusted Long-term Compensation Structure on Three-Year Strategic Deviation

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	73.779	82.555	72.198	82.064	73.301	82.079	101.70	109.50	73.23	100.95	71.455	99.793
Prior Three-Year Strategic Deviation	**-0.108**	**-0.109**	**-0.108**	**-0.109**	**-0.108**	**-0.109**	**-0.108**	**-0.109**	**-0.108**	**-0.109**	**-0.108**	**-0.109**
Size	1.607	0.565	1.643	0.578	1.449	0.407	1.577	0.552	1.496	1.611	1.537	1.871
Unabsorbed Slack	-5.653	-5.724	-5.646	-5.722	-5.668	-5.739	-5.641	-5.712	-5.628	-5.604	-5.620	-5.554
ROA	17.042	15.521	17.129	15.550	17.399	15.878	16.847	15.372	18.340	17.816	18.438	18.189
BOD Composition	-97.974	-98.880	-97.598	-98.766	-97.362	-98.268	-96.973	-97.873	-96.813	-96.385	-96.391	-93.957
BOD Independence	-64.675	-64.706	-64.687	-64.709	-64.909	-64.940	-64.040	-64.094	-63.893	-63.063	-63.907	-62.884
CEO Duality	1.074	1.054	1.297	1.121	1.064	1.043	2.319	2.264	1.177	2.404	1.428	4.152
Blockholder Ownership	0.053	0.053	0.053	0.053	0.055	0.055	0.056	0.056	0.050	0.051	0.050	0.051
CEO Ownership	0.914	0.924	0.923	0.927	0.922	0.933	0.879	0.890	0.918	0.876	0.928	0.919
Annual Compensation	-0.009	-0.010	-0.009	-0.010	-0.009	-0.010	-0.009	-0.010	-0.009	-0.009	-0.009	-0.009
Industry Adjusted Long-Term Compensation Structure	-3.793	-3.803	-3.817	-3.810	1.890	1.872	1.675	1.663	-0.817	-0.836	-0.818	-0.850
Age	0.580	0.563	0.610	0.572	0.601	0.584			0.586		0.619	
Tenure	0.079	0.024			0.081	0.026	0.391	0.328	0.089	0.392		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
Industry Adjusted LTCS x Age	0.056	0.056	0.057	0.056								
Industry Adjusted LTCS x Tenure					-0.143	-0.143	-0.131	-0.131				
Industry Adjusted LTCS x Options									0.000	0.000	0.000	0.000
F	**3.425**	**3.390**	**3.584**	**3.557**	**3.408**	**3.379**	**3.549**	**3.549**	**3.385**	**3.530**	**3.548**	**3.718**
R^2	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.021	0.022	0.021

All models include 4,715 firm-year observations across 731 firms. Bold coefficients are significant at the $p < .05$ level.

Table 26

Post Hoc Analysis with Industry Adjusted Long-term Compensation Structure on Three-Year Strategic Variation

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Prior Three-Year Strategic Deviation	-0.066	-0.066	-0.065	-0.065	-0.066	-0.065	-0.062	-0.062	-0.066	-0.063	-0.065	-0.064
Size	0.051	0.057	0.035	0.041	0.055	0.061	0.039	0.045	0.052	0.035	0.035	0.033
Unabsorbed Slack	0.005	0.004	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
ROA	**-1.024**	**-1.026**	**-1.037**	**-1.039**	**-1.017**	**-1.019**	**-1.025**	**-1.027**	**-1.022**	**-1.031**	**-1.035**	**-1.036**
BOD Composition	1.023	1.030	1.043	1.051	1.029	1.035	1.024	1.031	1.027	1.020	1.045	1.042
BOD Independence	-0.234	-0.234	-0.217	-0.217	-0.236	-0.236	-0.227	-0.226	-0.234	-0.224	-0.218	-0.217
CEO Duality	0.054	0.053	0.066	0.064	0.055	0.053	0.043	0.041	0.054	0.042	0.066	0.063
Blockholder Ownership	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
CEO Ownership	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Annual Compensation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Industry Adjusted Long-Term Compensation Structure	-0.032	-0.032	-0.044	-0.045	-0.012	-0.012	-0.011	-0.011	**-0.023**	**-0.022**	**-0.023**	**-0.023**
Age	-0.006	-0.007	-0.001	-0.001	-0.006	-0.007			-0.006		-0.001	
Tenure	0.008	0.009			0.008	0.009	0.005	0.005	0.009	0.005		
Option-based Overconfidence	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000
Industry Adjusted LTCS x Age	0.000	0.000	0.000	0.000								
Industry Adjusted LTCS x Tenure					-0.001	-0.001	-0.001	-0.001				
Industry Adjusted LTCS x Options									0.000	0.000	0.000	0.000
Chi^2	**97.630**	**95.050**	**97.510**	**94.920**	**206.230**	**203.630**	**201.610**	**198.670**	**97.940**	**96.130**	**97.930**	**96.690**
AR(1)	**-8.653**	**-8.655**	**-8.628**	**-8.630**	**-8.668**	**-8.670**	**-8.658**	**-8.660**	**-8.656**	**-8.646**	**-8.632**	**-8.631**
AR(2)	**-3.437**	**-3.439**	**-3.401**	**-3.403**	**-3.441**	**-3.444**	**-3.399**	**-3.400**	**-3.439**	**-3.396**	**-3.403**	**-3.408**
Hansen's J	391.170	390.320	394.360	393.470	391.760	390.910	391.760	390.790	390.370	390.250	393.230	393.260

All models include 3,866 firm-year observations across 714 firms. Bold coefficients are significant at the $p < .05$ level.

Results after Adjusting Long-term Compensation Structure by Industry

After adjusting long-term compensation by industry, each of the tests exhibited appropriate fit ($F < .05$ value in Tables 23, 24 and 25; $Chi^2 < .05$ in Table 26). This finding suggests that the tests can be used to assess the hypothesized relationships (Hair et al., 2006). The results of post-hoc analysis using *Industry Adjusted Long-term Compensation Structure* confirm prior findings; none of the four hypothesized relationships were supported. This is indicated by coefficients that are not significant and in the hypothesized direction on the four variables of interest (i.e. *Industry Adjusted Long-term Compensation Structure*, *Industry Adjusted LTCS x Age*, *Industry Adjusted LTCS x Tenure*, *Industry Adjusted LTCS x Options*). The coefficient on *Industry Adjusted Long-term Compensation Structure* was significant when: 1. three-year strategic deviation or three-year strategic variation were used as the dependent variable; and 2. option-based overconfidence was included in the model (Tables 24 and 26, Models 9 through 12). The direction of the relationships were opposite of what was hypothesized, however. As a result, Hypothesis 1 is not supported in these contexts because the relationship was not in the specified direction. Hypotheses 2, 3 and 4 were unsupported across all tests, as is indicated by the insignificant coefficients on the three moderating variables. In summation, none of the four hypotheses were supported after adjusting long-term compensation structure for industry. Although Hypotheses 1 was significant in a limited number of contexts (i.e. in Models 9 through 12 in Tables 24 and 26 only), because the relationships were not in the direction that was contended, this relationship is not be supported. Similarly, Hypotheses 2, 3 and 4 are not supported since they did not

significantly affect the relationships between long-term compensation structure and strategic change.

Summary of Post-hoc Analysis

None of the four hypothesized relationships received support in post-hoc analysis. While some significant relationships were found in the post-hoc analysis (e.g. Tables 16, 19, 24, and 26), these relationships were either not robust to various measures of strategic change or were not in the hypothesized direction. These findings suggest that none of the four hypotheses can be supported in post-hoc analysis. The findings of post-hoc analysis confirm the findings from hypotheses testing that none of the contended relationships are supported. Further, the findings from post-hoc testing help demonstrate that these relationships are consistent across the removal of potential confounds (i.e. diversification, time-period effects) and the adjustments of measures to facilitate comparison across groups (i.e. long-term compensation structure). The positive relationship between long-term compensation structure and strategic change that was contended in Hypothesis 1 was not supported. This relationship was not weakened by executive age or tenure (Hypotheses 2 and 3) and was not strengthened by executive overconfidence (Hypotheses 4).

SUMMARY

In this chapter, the results of hypotheses testing were discussed. These results were presented in five parts. First, the data collection process was explained. Second, descriptive statistics and correlations were discussed. Third, the underlying properties of the data were tested so that the appropriate analytical technique could be determined. Fourth, hypothesis testing was conducted. Fifth, post-hoc analysis was conducted to

investigate whether the findings from hypotheses testing were sensitive to the inclusion of certain variables or the measurement of variables that may not be comparable across groups within the sample (Hair et al., 2006). Results of hypotheses testing and post-hoc analysis were in agreement that the hypothesized relationships were not supported. These findings were consistent across four measures of strategic change as well as the removal of potential confounds and the adjustment of measures to facilitate group comparison. These findings are discussed in Chapter V.

CHAPTER V

CONCLUSION

The purpose of this research was to investigate how the individual characteristics of executives and the compensation structures under which they operate mutually affect organizational outcomes. Specifically, the role that executive age, tenure and overconfidence play in moderating the relationship between long-term compensation and strategic change was analyzed. In this chapter, the findings of this analysis are discussed. This discussion includes four parts. First, empirical results are reviewed. Second, implications of these results to both research and practice are provided. Third, limitations of the research are highlighted along with avenues for future research. The chapter concludes with a summary of the research.

Review of Empirical Results

The results of this dissertation fall in line with prior research that has demonstrated an inconsistent relationship between long-term compensation structure and organizational outcomes (Denis, 2001; Devers et al., 2007). While scholars have offered theoretical explanations for these equivocal findings (e.g. Hanlon et al., 2003; Jensen et al., 2004), little research has empirically assessed these rationales (Hambrick, 2007). One potential explanation for the inconsistent results, that executive characteristics

moderate the relationship between long-term compensation and organizational outcomes (Wowak & Hambrick, 2010), was investigated in this dissertation. The results of this dissertation did not support this argument on the organizational outcome of strategic change: analysis indicated a non-significant relationship between long-term compensation structure and strategic change and further, that this relationship was not significantly moderated by executive age, tenure or overconfidence as was posited.

Although various explanations have been offered as to why long-term compensation has not demonstrated consistent relationships with organizational outcomes (cf. Devers et al., 2007; Gomez-Mejia & Wiseman, 1997), two reasons appear to be most central to this dissertation. First, that the theoretical relationships are more complex than current theory contends (Denis, 2001; Wowak & Hambrick, 2010). Second, that measurement difficulties obscure the actual relationships (e.g. Jensen & Zajac, 2004; Rajagopalan & Spreitzer, 1997). Both of these possibilites are discussed in the next section.

Theoretical Complexity

One reason that has been suggested regarding why compensation research has failed to produce consistent findings is that these relationships are intricate (Devers et al., 2007; Wowak & Hambrick, 2010). As Denis (2001) notes, compensation relationships "interact in complicated ways with" other aspects of the firm such that a mechanism that affects behavior in one context "may have no impact in another, making it difficult to pick up a relation by examining a broad cross-section of firms" (p. 208). That is, because compensation is only one mechanism that affects executive decision-making, isolating this relationship is no easy task because various contextual factors could affect executive

actions (Sanders, 2001; Wowak & Hambrick, 2010). So while existing theory may support the contention that executive characteristics moderate the relationship between compensation and organizational outcomes (e.g. Cho & Hambrick, 2006; Hambrick, 2007), failure to account for additional interactions may contribute to inconsistent findings (Denis, 2001). One reason for the non-significant findings, then, is that additional moderators interact with long-term compensation and executive characteristcs.

Measurement Difficulty

A second explanation offered for the unsupported hypotheses is that measurement difficulty inherent to the study of executives (e.g. Hambrick & Mason, 1984; Jensen & Zajac, 2004; Webb & Weick, 1979) hindered the ability to assess the hypothesized relationships. These measurement difficulties were compounded with each of the three areas utilized in this dissertation (i.e. executive compensation, executive characteristics and strategic change). In the following section, measurement concerns with each of the three areas are addressed.

Measurement Difficultly with Executive Compensation

The lack of available information on executive compensation hinders the ability of researchers to assess relationships accurately (Denis, 2001). Because executives are not required to report all of their personal finances (e.g. the composition of their personal investment portfolio; alternative sources of income; spousal income, etc.), the ability to isolate the effects of compensation is difficult. That is, because how individuals respond to financial incentives may be different according to the composition of their investment portfolios (Jensen & Meckling, 1976), it may not be possible to isolate the effect of one type of compensation without accounting for the entirety of their personal holdings.

While it may be possible to utilize alternative methods to gain access to this data (e.g. interviews, surveys), scholars have illustrated that executives are particularly prone to respond inaccuratly to sensitive questions (Day, Schleicher, Unckless & Hiller, 2002). This occurs for a variety of reasons, including that executives want to manage impressions and because someone else (e.g. an administrative assistant) may actually fill out the material for them. As such, confidence in direct measures of executive compensation may be compromised because responses lack accuracy. Because of these limitations, scholars are stuck between the proverbial 'rock and a hard place' with respect to compensation research; while archival databases include limited information, direct assessments may have limited validity. Another reason for unsupported hypotheses, then, may be that difficultly in gathering executive compensation data limits the ability of researchers to isolate the effects of compensation.

Measurement Difficultly with Executive Psychological Characteristics.

Like compensation information, obtaining accurate data on the psychological characteristics of executives is difficult (Hambirck & Mason, 1984; Webb & Weick, 1979). The fact that both direct (e.g. Day et al., 2002) and indirect measures (e.g. Hiller & Hambrick, 2005) have limitations in assessing executive psychology may have impacted the accuracy of tests with respect to the moderating effects of overconfidence. For instance, while responses generated from direct assessment of executives often suffer from low validity, the same problem has plagued indirect measures. As a result of measures lacking validity, the ability to assess whether executive psychology is affecting how these individuals respond to compensation is compromised (Hair et al., 2006; Whitley, 2001). This limitation may have obscured the actual relationship posited in this

dissertation, contributing to the unsupported hypotheses with respect to the moderating role of executive overconfidence.

Measurement Difficultly with Strategic Change.

Limitations in the measurement of strategic change (e.g. different conceptualizations, time periods, measures) may be another factor that contributed to the equivocal results. Although steps were taken to overcome these limitations (e.g. using both strategic variation and strategic deviation, testing the relationships across two time periods), it is possible that none of these steps improved the validity of the measures. If measures are not valid, the ability the detect relationships consistently will be compromised (Hair et al., 2006; Whitley 2001). As such, difficulty measuring strategic change accurately may have contributed to the failure to support the hypothesized relationships.

Implications of Results

Although the hypotheses outlined in Chapter II were not supported, this dissertation still has implications for both research and practice. These implications are outlined in this section.

Implications for Research

Though management scholars have long dealt with questions regarding how executives affect their organizations (e.g. Berle & Means, 1932; Schumpeter, 1942; Smith, 1776), this literature stream continues to generate research (e.g. Ballinger & Marcel, 2010; Zhang & Rajagopalan, 2010). The findings of this dissertation contribute to that literature stream in two ways. First, scholars (e.g. Hambrick, 2007; Jensen & Zajac, 2004; Sanders, 2001) have noted that in order to advance our understanding of

executives' impact on organizational outcomes, it is necessary to combine insights gained from both upper echelons and agency theories. This dissertation answers that call by developing arguments regarding the moderating effects of executive characteristics (a tenet of upper echelons theory) on the relationship between long-term compensation (a tenet of agency theory) and organizational outcomes. Although the arguments provided were unsupported, they may serve as a starting point for future research. Scholars can enhance the arguments provided herein and address additional moderators that may have contributed to the unsupported hypotheses. As such, although the hypothesized relationships were unsupported in this dissertation, scholars can utilize this information to improve the development of their arguments in future investigations.

A second implication of this dissertation for researchers is that it has highlighed measurement difficulties associated with both executives and strategic change. The measurement concerns outlined in this research may provide insight to scholars in devising ways to overcome these concerns in future research. In particular, scholars may need to address 1. limitations in obtaining information regarding the personal financial portfolio of executives 2. problems associated with measureing executive psychological characteristics and 3. the lack of a consistent operalization of strategic change. As this research has illustrated, measurement difficulties in these areas may affect scholars ability to adequately assess hypothesized relationships. These findings may provide the impetus for scholars to improve measurement and echo the sentiments of scholars who have called for research on measurement of executive psychology (e.g. Hiller & Hambrick, 2005) and strategic change (e.g. Westphal et al., 2001). By overcoming these areas of concern, research can be improved and the robustness of analysis can be

enhanced. As such, highlighting measurement concerns with respect to assessing executive compensation, executive psychology and strategic change contributes to these respecitve literature streams.

Implications for Practice

An intended contribution of this dissertation was to add to our understanding of how executive characteristics interact with compensation structures. This information may be beneficial to the design of more effective executive compensation plans since Boards of Directors could utilize this knowledge to design payment schemes that illicit the desired actions from their executives. Although the results of this dissertation do not provide normative recommendations with respect to the interaction between executive characteristics and long-term compensation structure, this research may be of interest to practice nonetheless.

Perhaps the primary benefit of this dissertation was that it highlighted the difficulties facing scholars when measuring executives. This discussion may serve a as a call for organizations to be more active in providing information to researchers. Since the Board of Directors and shareholders are the primary beneficiaries of this knowledge, this research is particularly salient to these individuals. For the Board of Directors, developing a better understanding of what drives their executives to act in certain ways can help improve the design of compensation plans. That is, by accounting for additional factors that affect how executives respond to compensation, Boards can devise more effective incentive schemes. The Board of Directors can facilitate this line of inquiry by partnering with researchers and providing access to information on their executives.

For shareholders, knowledge of how executives may act given their personal characteristics and compensation structure may help identify which firms to invest in. One way for shareholders to help in this process is by taking a more active role in the corporate governance process. By informing Board members of their desires for increased access to executive characteristics and subsequently reinforcing these desires by voting for Board members who facilitate such information disclosures, shareholders can improve their ability to forecast organizational actions and make their investment decisions accordingly. Although the empirical findings did not support the hypothesized interactions, this dissertation may be informative to practice in calling for organizations to participate in this line of research by providing scholars with access to information on their executives.

Limitations and Future Directions

The conclusions drawn from this dissertation should be considered in the context of limitations to this research. These limitations are highlighted in this section, as are avenues for future research that can help scholars address these concerns.

The data collection method employed constitutes the first limitation of this dissertation. As previously mentioned, both direct and indirect assessments have their strengths and weaknesses with respect to studying executive compensation and psychology. In this dissertation, indirect assessment was utilized. Although indirect approaches allow researchers to assess phenomena longitudinally through the use of archival data, the methodology limits what can be utilized as measures. In particular, scholars can only assess those variables for which they can develop measures from existing sources.

The use of archival data creates two unique problems with respect to compensation data: 1. only publicly held firms are required to disclose compensation; and 2. the information that they are required to disclose is limited to firm-specific information, which hinders the ability to accurately assess the effects of compensation. These problems cannot be rectified unless scholars utilize alternative methodologies or influence corporations and their executives to disclose additional information in the future. As such, compensation scholars may want to consider the trade-offs of alternative methodologies to augment archival databases while also working with corporations to increase the accessibility of additional information. In particular, the interactive effects of compensation with individual characteristics may need to be isolated in qualitative research or through the use of laboratory studies and simulations (cf. Hambrick, 2007).

Similarly, because archival information is only amenable to the study of phenomena in which scholars can develop measures of the construct of interest, this method has limitations when assessing psychology (Whitley, 2001). Although indirect measures of executive psychology based upon archival data have added to our understanding of executive characteristics (e.g. narcissism, Chatterjee & Hambrick, 2007; hubris, Hayward & Hambrick, 1997), the validity of this method in assessing overconfidence has been questioned (Hiller & Hambrick, 2005). As a result, the accuracy in the measurement of the moderating role of overconfidence must be considered a limitation. Future research should endeavor to overcome this limitation. Some manners in which scholars may improve the assessment of executive overconfidence are: 1. pursuing the development of a valid proxy for use with archival data or 2. utilizing alternative methodologies (e.g. direct measurement, qualitative

approaches) to gain additional insights in this area. Both avenues may be valuable for future research.

Although the use of archival data may limit the information that researchers have access to, what researchers do with that data is individually controlled. As such, choices that researchers make can create limitations to their research. A limitation of this research that was individually controlled was that only a narrow subset of constructs was considered. For example, while compensation research has analyzed several facets of executive pay (Denis, 2001; Devers et al., 2007), this dissertation focused on only one aspect (long-term compensation). Similarly, although several executive characteristics have been related to various organizational outcomes (cf. Finkelstein et al., 2009), only three constructs were analyzed in this dissertation. Future research may want to expand this line of inquiry to other relevant constructs.

Along the same lines, while executive characteristics and compensation have both been related to strategic change, several other dependent variables have been similarly related. As a case in point, researchers have found that mergers and acquisitions are affected by both executive characteristics and compensation structures (Haleblian, Devers, Mcnamara, Carpenter and Davison, 2009). Scholars investigating the interaction of executive characteristics and compensation structures may want to consider a broader spectrum of dependent variables in future research. While prior outcomes that have been related to both compensation and executive characteristics (e.g. strategic change, mergers, acquisistions) may serve as a good starting point, extending this line of inquiry to other areas is recommended as well.

Lastly, the theoretical relationships around executive compensation may be more complex than was hypothesized in this dissertation (e.g. Denis, 2001). To uncover these relationships, scholars may need to turn to more complex theoretical arguments incorporating multiple contextual considerations. For instance, while theory may posit that executive characteristics moderate the relationship between long-term compensation and organizational outcomes (e.g. Cho & Hambrick, 2006; Hambrick, 2007; Wowak & Hambrick, 2010), a third contextual variable could further obscure this relationship. Examples of potential moderators include conditions in the external environment (McConnell & Servaes, 1995) and performance aspiration levels (Sanders, 2001). Future research aimed at uncovering such three-way interactions and other more complex relationships may advance this literature.

SUMMARY

Management scholars have long been interested in how executives affect the behavior of their organizations. Much of this research has employed one of two theoretical viewpoints (i.e. upper echelons theory or agency theory) although few studies have utilized the two in concert (Hambrick, 2007). This dissertation draws upon both viewpoints to investigate how the individual characteristics of executives moderate the relationships between long-term compensation structure and strategic change. Although this research 'failed' to support the hypothesized relationships, it is nonetheless a small step in the search to understand how executives affect the behavior of their organizations. For as Thomas Edison noted in reference to his many 'failed' attempts at invention:

> If I find 10,000 ways something won't work, I haven't failed. I am not discouraged, because every wrong attempt discarded is another step forward.

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VITA

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Dissertation: THE INTERACTION OF CEO CHARACTERISTICS AND COMPENSATION STRUCTURE AS DETERMINANTS OF STRATEGIC CHANGE

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Title of Study: THE INTERACTION OF CEO CHARACTERISTICS AND COMPENSATION STRUCTURE AS DETERMINANTS OF STRATEGIC CHANGE

Pages in Study: 132 Candidate for the Degree of Doctor of Philosophy

Major Field: Management

Scope and Method of Study:

This study investigated the relationship between CEO long-term compensation structure and strategic change and whether this relationship was moderated by the characteristics of CEO age, tenure and overconfidence. To test these relationships, archival data was gathered on publicly held corporations and their executives from 1996 through 2006.

Findings and Conclusions:

A relationship between CEO long-term compensation structure and strategic change was not found. Further, this relationship was not found to be moderated by executive age, tenure or overconfidence.

ADVISER'S APPROVAL: Dr. Margaret A. White