An Examination of the Influence of Top Executives on Entrepreneurial Orientation

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AN EXAMINATION OF THE INFLUENCE OF TOP EXECUTIVES ON
ENTREPRENEURIAL ORIENTATION

By
James Ruben Boling

A Dissertation

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The content and format of the dissertation are appropriate and acceptable for the awarding of the degree of Doctor of Business Administration.

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For: Joy, Matt and Daniel

The loves of my life
ACKNOWLEDGEMENTS

I have many friends and loved ones to thank for their support and encouragement. We tend to take for granted the love and caring of those around us until we really find ourselves in times of need. Completing this dissertation was one of those times.

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AN EXAMINATION OF THE INFLUENCE OF TOP EXECUTIVES ON
ENTREPRENEURIAL ORIENTATION

ABSTRACT

This collection of essays examines the influence that top executives have on the level of entrepreneurial orientation (EO) within an organization. EO is defined as the degree to which a firm exhibits behaviors and managerial philosophies that are innovative, proactive and risk-taking. EO is an extensively studied construct, yet there is still much to be explored and understood about its effects and predictors. This study adds to the discussion by examining predictors of EO in the two essays. Essay 1 examines the influence of top management team characteristics on entrepreneurial orientation and the moderating effect of managerial discretion.

This essay adds to the discussion of EO by invoking both the entrepreneurial orientation concept and upper echelons theory in an attempt to evaluate how the characteristics of the top management team (TMT) are related to the firm’s exhibition of an entrepreneurial orientation. It is posited that the more heterogeneous the team in industry and functional background the greater the organization’s EO. It is further argued that the level of education completed by the top management team will have a positive relationship with EO. Industry-level managerial discretion (managerial discretion) is hypothesized to moderate the TMT characteristics-EO relationship. Results from this research have important implications, for example, for human resource practices at the top management team level.
Essay 2 examines the relationship between CEO tenure and entrepreneurial orientation within family and non-family firms and adds to the knowledge base pertaining to EO by examining how CEO tenure is related to EO. Furthermore, it is expected that this relationship will be moderated by firm ownership type; specifically, family versus non-family firms. Over the course of a CEO’s tenure, an inverted-U relationship is posited such that EO is lower, but increasing in the CEO’s early-tenure stage, highest in the mid-tenure stage, and decreasing in the late-tenure stage. Managerial implications include the need to align incentives that encourage entrepreneurial behavior with the CEOs’ time-in-office as a basis for achieving or sustaining an appropriately entrepreneurial posture.
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CHAPTER 1
AN EXAMINATION OF THE INFLUENCE OF TOP EXECUTIVES ON ENTREPRENEURIAL ORIENTATION

ABSTRACT

This collection of essays examines the influence that top executives have on the level of entrepreneurial orientation (EO) within an organization. EO is defined as the degree to which a firm exhibits behaviors and managerial philosophies that are innovative, proactive and risk-taking. EO is an extensively studied construct, yet there is still much to be explored and understood about its effects and predictors. This study adds to the discussion by examining predictors of EO in the following essays.

ESSAY 1: The influence of top management team characteristics on entrepreneurial orientation and the moderating effect of managerial discretion

This essay adds to the discussion of EO by invoking both the entrepreneurial orientation concept and upper echelons theory in an attempt to evaluate how the characteristics of the top management team (TMT) are related to the firm’s exhibition of an entrepreneurial orientation. It is posited that the more heterogeneous the team in industry and functional background the greater the organization’s EO. It is further argued that the level of education completed by the top management team will have a positive relationship with EO. Industry-level managerial discretion (managerial discretion) is hypothesized to moderate the TMT characteristics-EO relationship. Results from this
research have important implications, for example, for human resource practices at the top management team level.

ESSAY 2: The relationship between CEO tenure and entrepreneurial orientation within family and non-family firms

This study adds to the knowledge base pertaining to EO by examining how CEO tenure is related to EO. Furthermore, it is expected that this relationship will be moderated by firm ownership type; specifically, family versus non-family firms. Over the course of a CEO’s tenure, an inverted-U relationship is posited such that EO is lower, but increasing in the CEO’s early-tenure stage, highest in the mid-tenure stage, and decreasing in the late-tenure stage. Managerial implications include the need to align incentives that encourage or discourage entrepreneurial behavior with the CEOs’ time-in-office as a basis for achieving or sustaining an appropriately entrepreneurial posture.

Both essays examine a sample of 210 publicly traded companies across five industries to test the relationships. EO is operationalized using Computer-Aided Text Analysis (CATA), an approach that is growing in popularity. Short et al. (2010) developed and tested a custom dictionary of words related to the elements of EO – innovativeness, risk-taking and proactiveness. This custom dictionary is used in both studies to determine the level of EO in the sample firms. Biographies of the top executives were used to determine TMT backgrounds and CEO position tenures. Blau’s (1977) index of heterogeneity is adopted in Essay 1 to calculate the heterogeneity of the top management team’s industry and functional background. Hambrick and Abrahamson’s (1995) ratings of managerial discretion by industry are employed in Essay
1. Essay 2 employs Anderson and Reeb’s (2004) operationalization of family versus non-family ownership. To assess the possible effects of endogeneity and lag on the relationships of interest, a three-year panel data design for the years 2007 through 2009 was constructed resulting in 630 observations.
CHAPTER 2: ESSAY 1

THE INFLUENCE OF TOP MANAGEMENT TEAM CHARACTERISTICS ON ENTREPRENEURIAL ORIENTATION AND
THE MODERATING EFFECT OF MANAGERIAL DISCRETION

ABSTRACT

Firms that are more entrepreneurially oriented perform better than those that are not. The strong positive relationship of entrepreneurial orientation (EO) to firm performance has fueled increasing interest in EO within the strategic management and entrepreneurship fields. Studies have examined the EO-to-firm performance relationship in various contexts and with numerous moderators. However, there has been limited study of the antecedents of EO. A vital question and the area of study that is beginning to gain increased interest is - how do firms foster and grow an entrepreneurial orientation? This study adds to the discussion by employing the upper echelons theory in consideration of how the top management team’s demographic characteristics are related to the firm’s entrepreneurial orientation. The upper echelons theory asks the question - do top managers matter in relation to performance and strategic decisions? This study finds that top managers do matter when it comes to strategic orientations, such as EO. A positive relationship between the demographic characteristics and EO is found. This study also finds that managerial discretion moderates the relationship of the educational
level of the TMT to EO. The findings provide evidence that firms should evaluate the diversity of their TMT to promote and maintain an entrepreneurial strategic posture.

INTRODUCTION

Who drives a firm’s strategic posture and how? This study attempts to address this question by evaluating how a top management team might influence a firm’s entrepreneurial orientation. This is an important question because entrepreneurially oriented firms have been found to be higher performing when compared with those that are not similarly oriented (Rauch et al. 2009, Miller 2011). Entrepreneurial orientation (EO) is a strategic posture in which a firm exhibits behaviors and managerial philosophies that are innovative, proactive and risk-taking (Miller 1983; Covin and Slevin 1991; Miller 2011). Since Miller (1983) defined EO in his seminal article, research has focused primarily on the examination of how the level of EO within a firm influences its performance (Covin and Slevin 1989; Rauch et al. 2009). Researchers have actively pursued a full understanding of the EO-performance relationship by investigating the different moderators and contextual variables that might influence the strength of the relationship, such as organization type, internal processes, knowledge, ownership type and many others (Rauch et al. 2009; Miller 2011). Although there is a great understanding of the strong support for the EO-to-performance linkage, there is limited understanding of the determinants or predictors of EO that enable the firm’s management to capture and maximize the positive performance outcomes of being entrepreneurially oriented (Rauch et al. 2009; Miller 2011). Therefore, this study adds to the discussion of EO by examining the relationship of the top management team’s demographic background to EO.
In their meta-analysis, Rauch et al. (2009, p. 763) stated that “EO may be viewed as the entrepreneurial strategy-making processes that key decision makers use to enact their firm’s organizational purpose, sustain its vision, and create competitive advantage(s).” The top management team (TMT) members are the primary decision makers of organizational strategic choices and thus influence organizational outcomes (Hambrick and Mason 1984; Hambrick et al. 1996). Covin and Slevin (1991, p.15) stated that “the decision to adopt an entrepreneurial posture must be considered a strategic choice.” Lumpkin and Dess (1996, p.136) mentioned how EO “emerges from a strategic choice perspective” and “involves the intentions and actions of key players.” Nevertheless, there has been limited study of how the makeup of key decision makers such as TMTs, might be related to EO. Although it has been found that TMTs add value to the firm through strategic choices, the level of influence of the TMT and its characteristics has been debated in several articles (e.g., Certo et al. 2006). The discussion has centered on the upper echelon theory originally posited by Hambrick and Mason (1984). The characteristics of the TMT, such as experiences, values and personalities greatly influence the team’s views and evaluations of business situations and therefore affect their strategic choices (Hambrick and Mason 1984). It has been further argued that TMTs with more varied backgrounds make better strategic decisions. This background diversity provides broader experiences and networks from which entrepreneurial opportunities - such as to grow beyond the current state through new ventures, expanded markets, and new product offerings - can be identified, evaluated and exploited (Miller 1983; Wiersema and Bantel 1992; Heavy and Simsek forthcoming). The diversity in a more heterogeneous team might also have an adverse effect. As
discussed later, too much heterogeneity may cause dysfunctional interpersonal conflict that limits the effectiveness of the team. Conversely, more homogeneous TMTs exhibit more groupthink and adherence to the status quo (Hambrick and Mason 1984; Williams and O’Reilly 1998). While more homogeneous teams make quicker decisions because of the similarities of perspectives, they also make poorer strategic decisions (Hannan and Freeman 1984). Even though homogeneous teams may be regarded as more cohesive, it is suggested in this study that type of conflict rather than cohesiveness is a better predictor of the effect that conflict has on entrepreneurial strategic choices.

Although TMTs drive strategic choice and organizational outcomes (Smith et al. 1994; Hambrick et al. 1996; Carpenter 2002; Carpenter et al. 2004), there has been disagreement as to the level of influence. In a meta-analysis, Certo et al. (2006) found that top management team diversity explained only 10% of the variance in firm performance. Hambrick (2007) discovered that moderators, such as managerial discretion and executive job demands, had a significant effect on the relationship between the top management team and organizational outcomes and thus increased the level of explanation. Hambrick (2007) called for additional studies that incorporate moderating variables to more fully explain the TMT-organizational outcomes relationship. Following Hambrick’s (2007) suggestions, this study evaluates how managerial discretion interacts with TMT demographic characteristics to strengthen the relationship between TMT background and EO.

“Discretion is a means of accounting for differing levels of constraint facing different top-management groups. Where discretion is low, the role of the top-management team is limited, and upper-echelons theory will
have weak explanatory power. Where discretion is high, managers can significantly shape the organization, and managerial characteristics will be reflected in organizational outcomes” (Finkelstein and Hambrick 1990, p.484).

Hambrick and Abrahamson (1995) found that the level of managerial discretion varied by industry. For example, the high-tech computer industry is considered a high discretion industry due to its product differentiability, high-growth, demand instability, low legal constraints and competitive industry structures. Conversely, the electric utility industry would be considered a low discretion industry because it is more regulated, capital intensive and less competitive (Finkelstein and Hambrick 1990). Within the high discretion computer industry the TMT would be afforded the latitude to make radical changes in strategy. On the other hand, within the low discretion utility industry the TMT would be limited in its latitude to make radical changes (Hannan and Freeman 1984; Finkelstein and Hambrick 1990). It is therefore argued that managerial discretion will moderate the relationship between TMT backgrounds and EO such that the higher the discretion of an industry the greater the opportunity for the TMT to exercise entrepreneurial choices as reflected in a higher EO.

In summary, the findings above present opportunities for extending and addressing gaps in the research of entrepreneurial orientation and top management teams. Specifically, this research examines the relationships between the functional background heterogeneity, industry background heterogeneity and educational level of a firm’s top management team and EO. It further examines the moderating effect that managerial discretion has on those relationships.
The remainder of the paper is structured as follows. The first section reviews the theoretical background and introduces the proposed hypotheses emerging from the literature. The second section discusses the methods of analysis including how the measurements of the variables are operationalized, why the specific data underlying this study are selected, how the data are collected and subsequently analyzed, and what the findings of the analysis mean. The final section discusses the implications of the study findings, limitations of the study and recommendations for further research.

THEORETICAL BACKGROUND

Entrepreneurial Orientation and Strategic Choice

Entrepreneurial orientation (EO) is the name given to entrepreneurial activities and processes that take place in an organization (Lumpkin and Dess 1996). The concept of EO has origins in the works of Mintzberg (1973) and Khandwalla (1987) that referred to the concept “as a managerial disposition embedded in decision-making, a view widely adopted in subsequent scholarly inquiry” (Covin and Wales forthcoming). The collection of studies positively relating EO to firm performance leads to the conclusion that firms that exhibit EO perform better than firms that do not. EO has been found in an increasing number of studies to be positively related to various measures of firm performance including ROA, sales growth, and profitability. (Covin and Slevin 1991; Wiklund 1999; Lee et al. 2001; Kuratko et al. 2003; Jantunen et al. 2008; Wiklund and Shepherd 2005; Covin et al. 2006; Madsen 2007; Naldi et al. 2007; Domke-Damonte et al. 2008; Green et al. 2008; Rauch et al. 2009). While the preponderance of research of EO has been on the direct and moderated relationship of EO to firm performance, there is a lack of empirical
study of the antecedents that affect the existence and intensity of EO. This research adds to the study of the antecedents of EO by evaluating the relationship of the TMT’s demographic characteristics with EO.

Miller (1983) described EO, as it is now known, as having three primary elements—innovativeness, risk taking, and proactiveness. Innovativeness is demonstrated through the introduction of new products/services and processes. Risk taking is demonstrated by committing significant resources in uncertain environments and taking on high levels of debt. Proactiveness is demonstrated through opportunity-seeking for competitive advantage (Miller 1983; Covin and Slevin 1989; Covin and Slevin 1991; Rauch et al. 2009). In a later study Lumpkin and Dess (1996) added the dimensions of competitiveness and autonomy to the three dimensions mentioned above for a total of five within the EO construct. Competitive aggressiveness is demonstrated through a firm’s direct actions to challenge competitors in an effort to outperform industry rivals. Autonomy is demonstrated through the independent actions of an individual or team in the pursuit of entrepreneurial opportunities. Although a number of studies have used the five dimension construct, a majority of EO studies have used the three original dimensions to define EO (Rauch et al. 2009). This research follows the majority of the studies and considers the three fundamental EO dimensions of innovativeness, risk taking, and proactiveness as collectively representing a unitary construct.

There has been an ongoing debate of whether the EO construct should be considered unidimensional or multidimensional.
“[R]esearchers commonly recognize the fundamental distinction between the unidimensional (a.k.a. ‘composite dimension’) view of EO associated most strongly with Miller (1983) and Covin and Slevin (1991) and the multidimensional view of EO associated most strongly with Lumpkin and Dess” (Covin and Wales forthcoming).

Miller (1983) and Covin and Slevin (1991) posited that the dimensions of EO should be considered a single construct consisting of the three elements – innovativeness, risk-taking and proactiveness. Lumpkin and Dess (1996) on the other hand have argued that the relationship of the dimensions vary depending on context and environmental conditions (Rauch et al. 2009). In the Lumpkin and Dess (1996) conceptualization, each of the five described dimensions are viewed as separate constructs and thus the results are interpreted based on a pattern of findings of each individual variable’s relationship to the variable of interest. However, in the Miller (1983) and Covin and Slevin (1991) conceptualization, all three dimensions must coexist to describe EO as an organizational level construct.

Lumpkin and Dess (1996) argue that the unidimensional conceptualization that Miller (1983) and Covin and Slevin (1991) posit is too narrow to explain some types of entrepreneurship. It seems that having one dimension or variable at a relatively high level and all others at a relatively low level might provide an explanation for an entrepreneurial action, but not necessarily a firm-level posture. For the organization to be oriented toward entrepreneurship would require some level of measure in all three variables working together. For instance, to enter into new product markets would require relatively high levels of innovation, risk taking and proactiveness. To be
innovative in coming up with new products alone is not sufficient. The risk taking and proactiveness involved with entry into new products and markets is also required. As Miller (1983, p.780) stated,

“In general, theorists would not call a firm entrepreneurial if it changed its technology or product-line (‘innovated’ according to our terminology) simply by directly imitating competitors while refusing to take any risks. Some proactiveness would be essential as well. By the same token, risk-taking firms that are highly leveraged financially are not necessarily considered entrepreneurial. They must also engage in product-market or technological innovation. Thus our focus upon the composite dimension is intuitively reasonable.”

This study tests the relationship between the TMT characteristics and the entrepreneurial strategic posture of the firm. Separately the dimensions would not necessarily indicate a firm-level entrepreneurial posture by itself. Therefore, the Miller (1983) and Covin and Slevin (1991) conceptualization of a unidimensional construct with the three dimensions of innovativeness, proactiveness and risk taking is used.

Innovative, risk taking and proactive strategic choices are made by top management teams in organizations. These strategic choices cannot be separated from top management values and philosophies which have been found to be major determinants of competitive strategic choices (Covin and Slevin 1991). Strategic choice, as defined by Child (1972; 1997) is the process in which organizational power-holders decide upon courses of strategic action. Hambrick and Mason (1984) have posited in
their upper echelon theory that the demographic makeup of the top management team will emulate the cognitive base of the team thus influencing the strategic decisions and choices of business opportunities presented to the firm. Covin and Slevin (1989, p.218) stated that

“[e]ntrepreneurial firms are those in which the top managers have entrepreneurial management styles, as evidenced by the firms’ strategic decisions and operating management philosophies. Non-entrepreneurial or conservative firms are those in which the top management style is decidedly risk-averse, non-innovative, and passive or reactive.”

It is suggested in the current study that entrepreneurial strategic decisions of the TMT creates an entrepreneurial orientation in which a firm “engages in product-market innovation, undertakes somewhat risky ventures, and is the first to come up with ‘proactive’ innovations, beating competitors to the punch” (Miller 1983, p.771).

Upper Echelons and TMT Background Characteristics

Since Hambrick and Mason (1984) developed the theory of upper echelons, a steady stream of research has used the upper echelons theory to study the effects that a top management team (TMT) has on the performance and strategic choices of an organization (Smith et al. 1994; Hambrick et al. 1996; Carpenter 2002). The main emphasis of the upper echelons theory is that top executives’ values, experiences, and personalities influence their interpretations of business situations and affect strategic choices (Hambrick and Mason 1984; Hambrick 2007). Hambrick and Mason (1984; 1987; 2007) have argued that the demographics of the top management team reflect the
cognitive bases from which TMT members make their decisions. These demographics, including educational level, functional background, age, tenure, and others, have been empirically shown to influence the strategic choices made by the TMT (Hambrick and Mason 1982; Certo et al. 2006; Heavey and Simsek forthcoming).

Functional and Industry Background Heterogeneity

The heterogeneity of the TMT’s demographic characteristics has shown significant results in predicting strategic choice (Hambrick and Mason 1984; Hambrick et al. 1996; Carpenter et al. 2004; Charles et al. 2004; Li-Qun et al. 2005; Olson et al. 2006; Nielsen 2009). Heterogeneity refers to the diversity of the demographic characteristics of the team members. To the extent that the team members have similar characteristics, the team would be less diverse or homogeneous. When team members have dissimilar characteristics, the team is more diverse or heterogeneous. The varying backgrounds and experiences of team members provide a wide range of knowledge and skills that encourage strategic choices that are more innovative and risk-taking (Wiersema and Bantel 1992; Van Door et al. forthcoming). Bantel and Jackson (1989) found that when solving complex, non-routine problems, groups with varied skills, knowledge, abilities and perspectives are more effective. Williams and O’Reilly (1998) have argued that a more heterogeneous team will result in increased information flow due to the broader outside connections of the members. The increased information from these connections enhances the opportunity-seeking actions of the team (Williams and O’Reilly 1998; Van Door et al. forthcoming). The varied backgrounds and the increased information flow will also help the team avoid a tendency toward groupthink commonly associated with
homogeneous teams (Janis 1982; Hambrick and Mason 1984; Peterson et al. 1998; Van Doorn et al. forthcoming; Heavey and Simsek forthcoming).

It is posited in this study that the heterogeneity of the TMT demographics results in the additional benefit of increased social capital from which to identify a greater number of entrepreneurial opportunities. Unlike other types of capital, such as physical or financial, social capital lives in the relations between people and among those people within the social structure (Nahapiet and Ghoshal 1998; Heavey and Simsek forthcoming). Social capital is generated through changes in the relations of corporations, teams and individuals that facilitate action. Information obtained from social networks is important for decision making and provides a basis for action (Coleman 1988). Activities and interactions spanning outside the team boundaries have an effect on organizational outcomes. The information cues gained through the interactions that executives have outside the organization shapes the executives’ view of the environment and therefore the decisions made (Geletkanycz and Hambrick 1997).

“Thus, firms that establish many external network ties may be able to gather diverse knowledge about a wide variety of potential strategic opportunities, such as ideas for additional product offerings” (Houghton et al. 2009, p.1256). The findings of this collection of research suggest that a more heterogeneous team will generate greater external interactions and social capital and thus present more entrepreneurial opportunities.

At the same time it has been found that heterogeneous teams have more conflict than homogeneous teams because of the variety of experiences and backgrounds (Eisenhardt et al. 1997). There are a number of plausible predictors when discussing
team conflict and its influence on organizational outcomes. Team cohesiveness and type of conflict, such as task versus interpersonal, have been studied in an attempt to understand positive team dynamics (Amason 1996; Pelled et al. 1999; Certo et al. 2006). While low heterogeneity may be generally associated with higher levels of cohesiveness, conflict and cohesiveness are imperfectly correlated and likely to have distinct effects on the outcomes of interest (Stein 1976; Ensley et al. 2002). This study suggests that type of conflict is a better predictor of the effect that conflict has on entrepreneurial strategic choices. Task and interpersonal conflict are primary drivers of the quality of group decision making such as entrepreneurial strategic choices (Schweiger et al. 1986; Amason 1996; Jehn 1997). Task conflict is due to the variety of background characteristics including industry experience, functional background and educational background that make the TMT innovative decision makers (Amason 1996; Pelled et al. 1999; Certo et al. 2006; Ward et al. 2007). Conflict may seem an unwanted dynamic within a team because it is commonly associated with dysfunctional behavior. However, scholars have generally found that task conflict results in better decisions (Jehn 1995; Amason 1996; Jehn 1997; Pelled et al. 1999; Jehn and Mannix 2001; Certo et al. 2006). Eisenhardt et al. (1997) found that teams with the highest level of task conflict led the highest performing firms and that the lower conflict teams did not do as well. They also found that homogeneous teams with less conflict tended to not consider key issues and that the team’s strategic choices were considered poor (Eisenhardt et al. 1997). When there is heated discussion, strategic options are explored more deeply and a stronger consensus gained. This debate is positive when the conflict is task oriented rather than interpersonal. The opposite effect occurs when the conflict is interpersonal.
Interpersonal conflict has been found to be dysfunctional and a hindrance to effective decision-making (Jehn 1995; Amason 1996; Jehn 1997; Certo et al. 2006). Studies have found interpersonal conflict to be more prevalent in TMTs that are extremely heterogeneous (Amason 1996; Eisenhardt et al. 1997; Schweiger et al. 1986). For instance, if there is too wide of a spread of age, younger members may not be willing to speak up as much thereby limiting their creative input. Also, if there is too wide of a variance in tenure, there may be a power inequity possibly creating a dominating coalition (Eisenhardt et al. 1997).

In addition to the diversity of characteristics creating conflict that may or may not increase the level of EO, the type of characteristics may also add to the form and level of conflict. Olson et al. (2006) argues that the demographic characteristics should be classified as job or non-job related. Job-related characteristics are found to be more significant to firm performance (Pelled et al. 1999). Functional and industry background can be considered job-related characteristics because they are associated with the development of technical skills, knowledge, expertise, and experience in the industry. Gender and age are naturally given and can therefore be considered non-job related. It has been found that age generally creates social conflict resulting in indecision and lower team performance (Pelled et al. 1999). This study investigates the relationship of the heterogeneity of the firm’s top management team’s job-related demographic characteristics of functional background and industry background with entrepreneurial orientation.

Functional Background Heterogeneity – The functional background heterogeneity of top management teams has been studied in relation to firm performance and a wide range of
other outcome variables such as innovation, new venture performance, initial public offerings and strategic choices, to mention a few (Chaganti 1987; Bantel and Jackson 1989; Ensley and Pearson 2005; Zimmerman 2008). It has been suggested in these studies that a team with higher levels of heterogeneous backgrounds will have access to broader social networks, knowledge and experiences resulting in more entrepreneurial opportunities when compared to a homogeneous team. Diversity in the functional background provides the range of knowledge and expertise for ensuring the team considers areas of the organization when identifying, analyzing, developing and implementing new entrepreneurial opportunities. It also encourages different perspectives to problem solving and discussion of points of view (Bantel and Jackson 1989; Eisenhardt et al. 1997). Eisenhardt and Schoonhoven (1990) found that TMTs that are more functionally diverse will be better able to take advantage of strategic opportunities and thus promote growth, a vital characteristic of entrepreneurial firms. Based on the findings from the literature, the following hypothesis is presented.

Hypothesis 1: Functional background heterogeneity of the TMT is positively related to an organization’s entrepreneurial orientation.

Industry Background Heterogeneity – There has been limited interest in the heterogeneity of industry experience of team members in past research. It has been argued that the variety of experiences in various industries will have similar influences over the decision making of the TMT as the heterogeneity of functional backgrounds (Hambrick et al. 2005). Experiences across industries provide TMT members with broader knowledge and experiences to bring in ideas that do not suffer the accepted way of doing things in a particular industry. Conversely, “executives in certain industries may share a common
set of strategic assumptions – ‘recipes’ to achieving high performance in their industry. This constrains the strategic choices that are adaptive and outside the industry norms” (Child 1997, p.50), thereby creating organizational inertia. Organizational inertia results from team members who have been in the same industry for an extended time. Innovation and risk taking may be limited in decision making due to team members relying on what has worked in the past and not trying new approaches (Hannan and Freeman 1984). According to Chaganti (1987, p.395),

“Every executive carries a ‘bag of tricks’ which are believed to work in certain situations. Executives tend to display these in the form of their perceptions, beliefs and values which are based on the executives’ previous experiences. Top executives, who have made it to the top from within, tend to have a very restricted knowledge base from which to formulate corporate responses to environmental changes (Hambrick and Mason, 1984) while outsiders are thought to have a wider knowledge base.”

The findings presented above suggest that a team that has a higher level of industry heterogeneity will experience more innovative, risk-taking and proactive decision making. Based on the presented findings, the following hypothesis is formulated.

Hypothesis 2: Industry background heterogeneity of the TMT is positively related to an organization’s entrepreneurial orientation.
TMT Education Level

While the heterogeneity of the functional and industry background characteristics of a TMT enables greater information gathering and conflict that promotes deeper discussion of options, TMT members with higher levels of education have a greater capacity to identify entrepreneurial opportunities and understanding for exploiting those opportunities. All three characteristics work together to create a more entrepreneurially oriented firm. Similar to background heterogeneity, education provides additional opportunities to span different social and business networks and increase social capital. Executives spend most of their time spanning boundaries in their social context and economize the search process by relying on established channels (Geletkanycz and Hambrick 1997). By making connections across boundaries including education channels, the TMT will develop expanded perspectives and enjoy increased information flow. Team members that share the same environment limit the access to new or unique information which reduces the variety and novelty of insights (Geletkanycz and Hambrick 1997). It is posited in this study that educational level will have a similar effect because of the different environments in which contacts are made.

In addition, higher education levels result in greater abilities to process and evaluate a wider variety of information (Wiersema and Bantel 1992) and these highly educated teams will be creative and flexible in their strategic problem solving (Carpenter and Fredrickson 2001). Furthermore, educational level is positively related to innovation (Bantel and Jackson 1989) and receptivity to innovation (Kimberly and Evanisko 1981). Absorptive capacity, or the ability to absorb new information, is greater in higher educated employees giving rise to increased creativity through the association of old and
new information (Daghfous 2004). A higher average educational level provides teams with the diversity of skill sets to manage complex and high information-processing demands associated with market expansions which require innovation, risk-taking and proactiveness. These teams will be creative and flexible in their strategic problem solving (Carpenter and Fredrickson 2001). It is argued in this study that the higher the level of TMT education the greater the entrepreneurial opportunity identification and exploitation. Based on the above findings the following hypothesis is presented.

Hypothesis 3: Educational level of the TMT is positively related to an organization’s entrepreneurial orientation.

Managerial Discretion

Even though several researchers have found support for the upper echelons theory, many have disputed it and pointed to its limited explanation of the variance in firm performance (Hannan and Freeman 1984; Carpenter 2002; Certo et al. 2006). This posited limitation has set up a line of discussion leading to varying results. In their meta-analysis, Certo et al (2006) found the results of studies testing the influence that upper echelons have on firm performance to be relatively modest. They also noted evidence of the presence of moderating variables intervening in the relationship and argued that the lower level of explanation was due to the absence of moderators in the research. In his update of the upper echelon theory, Hambrick (2007) found that managerial discretion of the top executives positively moderated the relationship of the heterogeneity of demographic characteristics of the TMT to organizational outcomes. It is argued in this
study that managerial discretion will moderate the relationship of the TMT demographic characteristics with EO in a similar manner.

Discretion refers to the latitude of actions that top management teams experience as a result of environmental and internal forces. When discretion is low, the effect that top management teams make through their decisions and actions is limited. Conversely, when discretion is high, top management teams can have an effect on the organization’s strategic posture and outcomes (Finkelstein and Hambrick 1990). Hambrick and Finkelstein (1987) presented managerial discretion as a “bridge” to reconcile two opposing theories of executives’ influence on organizational outcomes. The prevailing thought in strategic management is that executives influence the organization’s outcomes. The population ecology and institutional theorists, on the other hand, adhere to the perspective that executives have little influence over organizational outcomes because the organizations are influenced by external forces. Hambrick and Finkelstein (1987) further argue that both theories could coexist depending on the amount of managerial discretion.

Managerial discretion, defined as “latitude of action,” is a critical contextual consideration in the study of top management teams and their strategic decisions (Hambrick and Finkelstein 1987, p.369). Discretion originates from the environment and organization in which the manager is active. Managers in high discretion contexts have a greater opportunity to exercise their judgments and strategic actions. Managers in low discretion contexts are constrained in their actions (Hambrick and Finkelstein 1987). The level of discretion provided to managers differs across industries (Goll et al. 2008). For instance, in a highly regulated industry such as airlines, the TMT will experience low managerial discretion and be constrained in their actions. On the other hand, the TMT of
a high-tech company will be afforded more latitude in their decisions and actions due to the high growth, product differentiation and competitiveness of the industry (Hambrick and Finkelstein 1987; Finkelstein and Hambrick 1990; Cordeiro and Rajagopalan 2003; Goll et al. 2008).

Managerial characteristics will be reflected in strategy and performance when managerial discretion is present, but will not when it is lacking (Hambrick and Finkelstein 1987). While research incorporating managerial discretion has been limited, the findings have supported the premise. For instance, Halebian and Finkelstein (1993) found a positive and significant relationship between team size and firm performance in high discretion environments, but not in low discretion environments. Goll et al. (2008) found considerable support for the effect that managerial discretion had on the relationship of top management team characteristics and business strategy in the airline industry after deregulation. They found that managers were given more discretion to make choices in the deregulated environment and less discretion to make choices in the regulated environment.

“The implications of managerial discretion for upper echelons theory are straightforward — and profound: upper echelons theory offers good predictions of organizational outcomes in direct proportion to how much managerial discretion exists” (Hambrick 2007, p.335).

In summary, the benefit of entrepreneurial decision making that is associated with a TMT that is heterogeneous in functional and industry backgrounds will not be as prominently exhibited in firms in low discretion industries limiting the exhibition of EO.
On the other hand entrepreneurial decision making will be more enabled in high discretion industries allowing the greater exhibition of EO. In addition, TMTs with higher education are more receptive to change and new ideas. However, in low discretion industries TMTs will not have the latitude to implement new ideas or make radical changes and EO will be limited. Conversely, TMTs in higher discretion industries will be free to make radical changes and implement new ideas enabling the exhibition of EO. Therefore, this study argues that discretion will moderate the relationship of the heterogeneity of the TMT’s industry background heterogeneity, functional background heterogeneity and educational level with EO such that the higher the managerial discretion the stronger the relationship. In particular, the following hypotheses are offered.

Hypothesis 4: Managerial discretion will moderate the relationship between TMT industry background heterogeneity and entrepreneurial orientation such that the higher the managerial discretion the more positive the relationship.

Hypothesis 5: Managerial discretion will moderate the relationship between TMT functional background heterogeneity and entrepreneurial orientation such that the higher the managerial discretion the more positive the relationship.

Hypothesis 6: Managerial discretion will moderate the relationship between TMT educational level and entrepreneurial orientation such that the higher the managerial discretion the more positive the relationship.
A figure of the conceptual framework is presented below.

FIGURE 1
Conceptual Model

METHODS

Data Collection

The data are selected from a set of publicly traded companies found in Capital IQ, Wharton Research Data Services (WRDS) and Board Analyst, widely used databases for company-wide information. Also, when needed for confirmation or additional information, individual company websites and 10-Ks were referenced. Because of the need to have access to annual reports to determine a firm’s level of entrepreneurial orientation using a content analysis method as described below, the companies selected do not include private companies where annual reports are not readily available. Also, the demographic information of top management team members is more readily available.
in publicly traded companies versus private firms where information is limited and often inconsistent. The use of information for publicly traded firms published in subscription and public databases is consistent with other literature (Finkelstein and Hambrick 1990; Pearce and Zahra 1992; Anderson and Reeb 2004; Valenti 2008).

The data are selected from five four-digit SIC industry classifications selected from Hambrick and Abrahamson’s (1995) managerial discretion list shown in Table 3. The five industries were selected because they represented high, low and middle levels of discretion based on their growth rate, regulatory environment, product development and capital intensity characteristics. The broad representation of discretion levels was included to fully examine the discretion interaction with CEO tenure and to ensure a more representative sample. The data for 210 companies were collected in a panel method for the years 2007 through 2009. The 630 observations are dummy-coded by data year. The sample size exceeds the minimum ratio of five samples for every variable and the desired level of between 15 to 20 observations for each variable suggested by Hair et al. (2010).

Entrepreneurial Orientation (Dependent Variable)

Entrepreneurial orientation is operationalized as a unidimensional construct comprised of the elements innovativeness, risk-taking and proactiveness consistent with the Miller (1983) and Covin and Slevin (1991) conceptualization of a joint exhibition of the three elements. The focus of this study is the evaluation of the overall entrepreneurial orientation of the firm and not the individual elements of innovativeness, risk taking and
proactiveness, therefore the EO construct is measured by the additive value of the three elements.

EO is measured using content analysis of 10-K annual reports for the years 2007 through 2009. The content analysis of corporate texts such as shareholder letters, press releases, 10-Ks and annual reports is an increasingly popular technique used by organizational scholars because of its numerous benefits, for example its unobtrusive nature (Short et al. 2010). Content analysis is a combination qualitative and quantitative method that provides for a rigorous process of gathering data that are otherwise difficult to obtain for management studies. The primary assumption behind the content analysis method is that it recognizes that through the language used one can develop an understanding of the cognitive schemas of management (Duriau et al. 2007).

Consistent with the procedure outlined by Short et al. (2010), the current study uses Computer-Aided Text Analysis (CATA) to process annual reports of the sample companies. LIWC2007, a widely used CATA software package, is used to process the 10-K text files and obtain a count of the words that match the custom dictionary developed and tested by Short et al. (2010) specifically for the purpose of determining EO. The words in the custom EO dictionary shown in Table 1 below were deductively-derived based on prior EO literature. Short et al. (2010) first developed an exhaustive list of words in an effort to capture the full theoretical domain of each EO dimension. Following the procedure recommended by Neuendorf (2002), each deductively-derived word list is mutually exclusive having each word pertaining to only one theoretically intended construct and includes synonyms and derivations of each word. Next, two entrepreneurship scholars refined the list to determine each word’s applicability to the
<table>
<thead>
<tr>
<th>EO Dimension</th>
<th>Dictionary Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness</td>
<td>Ad-lib, adroit, adroitness, bright-idea, change, clever, cleverness, conceive, concoct, concoction, concoctive, conjure-up, create, creation, creative, creativity, creator, discover, discoverer, discovery, dream, dream-up, envisage, envision, expert, form, formulation, frame, framer, freethinker, genesis, genius, gifted, hit-upon, imagination, imaginative, imagine, improvise, ingenious, ingenuity, initiative, initiator, innovate, innovation, inspiration, inspired, invent, invented, invention, inventive, inventiveness, inventor, make-up, mastermind, master-stroke, metamorphose, metamorphosis, neoteric, neoterism, neoterize, new, new-wrinkle, innovation, novel, novelty, original, originality, originate, origination, originative, originator, patent, radical, recast, recasting, resourceful, resourcefulness, restyle, restyling, revolutionize, seethings, think-up, trademark, vision, visionary, visualize</td>
</tr>
<tr>
<td>Proactiveness</td>
<td>Anticipate, envision, expect, exploration, exploratory, explore, forecast, foreglimpse, foreknow, foresee, foretell, forward-looking, inquire, inquiry, investigate, investigation, look-into, opportunity-seeking, proactive, probe, prospect, research, scrutinization, scrutiny, search, study, survey</td>
</tr>
<tr>
<td>Risk taking</td>
<td>Adventuresome, adventurous, audacious, bet, bold, bold-spirited, brash, brave, chance, chancy, courageous, danger, dangerous, dare, daredevil, daring, dauntless, dicey, enterprising, fearless, gamble, gutsy, headlong, incautious, intrepid, plunge, precarious, rash, reckless, risk, risky, stake, temerity, uncertain, venture, venturesome, wager</td>
</tr>
</tbody>
</table>

dimension’s conceptual definition. Inter-rater reliability of the coding scheme ranged from $r = 0.75$ to $r = 0.88$ across all dimensions (Short et al. 2010).
An additional step was required to standardize the initial word counts because annual reports are of different lengths. Therefore, the raw word counts were divided by the total word count in the 10-K yielding a standardized value. The standardized values for all three dimensions of innovativeness, risk-taking and proactiveness were summed to create a measure of the firm’s EO score. Higher scores indicate more EO and lower scores less EO.

TMT Background Characteristics (Independent Variables)

Three top management team demographic characteristics - functional background heterogeneity, industry background heterogeneity and education level - are examined. The three variables were selected because it is argued that they are predictive of the characteristics, networks and decision-making preferences of top management teams who positively influence EO (Bantel and Jackson 1989; Hambrick et al. 1996; Carpenter 2002). The levels are coded based on the list shown in Table 2.

TMT Definition

Prior to our discussion of the operationalization of the TMT characteristics, the definition of a TMT is discussed. There has been considerable debate as to the definition of the top management team and yet there does not seem to be any significant agreement among researchers as to the definition of the TMT. Some researchers have argued that the TMT is made up of only those on the executive committee (Carpenter et al. 2004). Others have argued that the membership on the TMT should be based on titles such as Vice President and above or Senior Vice President and above. More recently, the primary criterion for selection of top management team members is based on the
TABLE 2
Top Management Team Characteristics

<table>
<thead>
<tr>
<th>Functional Background</th>
<th>Industry Experience</th>
<th>Educational Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>Academic</td>
<td>No College Degree</td>
</tr>
<tr>
<td>Accounting</td>
<td>Airline</td>
<td>Bachelors</td>
</tr>
<tr>
<td>Consultant</td>
<td>Automotive</td>
<td>Masters/Legal</td>
</tr>
<tr>
<td>Engineering / Technical</td>
<td>Chemical</td>
<td>Juris Doctor</td>
</tr>
<tr>
<td>Executive/Management</td>
<td>Communications</td>
<td>Doctoral (Ph.D., M.D.)</td>
</tr>
<tr>
<td>Finance</td>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>Government / Public</td>
<td>Consumer</td>
<td></td>
</tr>
<tr>
<td>Law</td>
<td>Distribution</td>
<td></td>
</tr>
<tr>
<td>Logistics</td>
<td>Electronics</td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td>Financial Services</td>
<td></td>
</tr>
<tr>
<td>Medical Doctor</td>
<td>Food Services</td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td>Government</td>
<td></td>
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<td></td>
<td>Healthcare</td>
<td></td>
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<tr>
<td></td>
<td>Industrial</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Law</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Military</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed</td>
<td></td>
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<td></td>
<td>Retailing</td>
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<td></td>
<td>Professional Services</td>
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<td></td>
<td>Software</td>
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<td></td>
<td>Telecommunications</td>
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<td></td>
<td>Transportation</td>
<td></td>
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<tr>
<td></td>
<td>Utilities</td>
<td></td>
</tr>
</tbody>
</table>

convenience of data because the availability of biographical descriptions of executives is limited. Therefore, most current researchers are selecting team members based on executives listed in company 10-K reports (Carpenter et al. 2004). The current research includes a sample of publicly traded companies and thus follows the recent trends in data collection and adopts the guideline of using executives listed in the company 10-K as the definition of the TMT.
TMT Functional and Industry Background Characteristics

Biographical data for each member were collected from subscription and public databases such as WRDS, Capital IQ, Forbes, Newsweek, company websites and annual reports and coded accordingly in the areas of industry and functional background based on the codes shown in Table 2. The coding of data may result in bias due to different rater backgrounds and abilities, especially when multiple raters are employed (Hair et al. 2010). In this study the coding of the backgrounds required very little interpretation and was a straight-forward categorization because the biographies of the executives typically included the specific dates of their employment by company. In addition, there was a single rater enabling consistency of the coding.

The codes were then used to determine the level of heterogeneity of the functional and industry background. Blau’s (1977) index of heterogeneity, which has been used in several studies measuring categorical variables, was adopted to calculate the level of industry and functional background heterogeneity (Wiersema and Bantel 1992; Hambrick et al. 1996; Naranjo-Gil et al. 2008). The index was calculated using the following formula:

\[
H = 1 - \sum_{i=1}^{N} (p_i)^2
\]

In this formula, “p” is the proportion of a team in the respective diversity category and “i” is the number of different categories represented on the team.
Educational Level

The educational levels of top executives were determined based on the codes shown in Table 2. The educational level is operationalized as the average of the highest degree level obtained by the top managers within a team based on the coding in Table 2.

Managerial Discretion (Moderating Variable)

Managerial discretion was operationalized by applying the managerial discretion rating by industry as determined by Hambrick and Abrahamson (1995). The ratings are shown in Table 3 below.

<table>
<thead>
<tr>
<th>Industry</th>
<th>SIC Code</th>
<th>Discretion Rating</th>
<th>Number of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum/natural gas production</td>
<td>1311</td>
<td>2.33</td>
<td>105</td>
</tr>
<tr>
<td>Certified air transportation</td>
<td>4512</td>
<td>3.23</td>
<td>33</td>
</tr>
<tr>
<td>Semiconductors</td>
<td>3674</td>
<td>4.61</td>
<td>195</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>2834</td>
<td>5.54</td>
<td>189</td>
</tr>
<tr>
<td>Computer programming</td>
<td>7372</td>
<td>6.38</td>
<td>108</td>
</tr>
</tbody>
</table>

Hambrick and Finkelstein (1987) introduced six industry-level or task-level elements as measures of managerial discretion including product differentiability, market growth, industry structure, demand instability, quasi-legal constraints, and capital intensity. They viewed the construct as one in which all the variables worked together to affect the level of managerial discretion in an industry. However, Hambrick and Abrahamson (1995 p. 1430) argue that “industry-level discretion has multiple origins that
do not covary.” Therefore the additive and independent effects should be considered when evaluating the level of discretion available to managers in an industry. Due to the multidimensional nature of managerial discretion, Hambrick and Abrahamson (1995) sought to establish a measure of the overall amount of discretion in an industry by having a group of researchers who had knowledge of managerial discretion literature rate different industries. Seventeen industries were eventually rated. Inter-rater reliability was tested by having a select group of experienced investment managers rate the discretion within industries where they were experts. The ratings from the researchers were found to be reliable. The third step was to compare the ratings with findings from the seven dimensions of Hambrick of Finkelstein (1987). “The overall equation was highly significant ($R^2 = .492$, $p < .001$), indicating the panel ratings had substantial predictive validity” (Hambrick and Abrahamson 1995, p. 1433). As previously mentioned, five industries were selected from among the 17 rated industries and used in this study (see Table 3).

Control Variables

Firm Age – During the life of an organization the make-up and level of EO may change (Miller and Friesen 1984). Controlling for the age of the firm is necessary to ensure that this study is measuring the effects of the TMT background characteristics and not the effects of age. Firm age is operationalized as the life of the firm based on its recorded establishment date (Covin et al. 2006; Casillas 2010).

Firm Size – Firm size was chosen as a control variable for this study because it has been argued that larger firms have more resource availability to pursue
entrepreneurial opportunities (Bantel and Jackson 1989). However, it has also been argued that smaller firms are more agile and can move quicker and more successfully in pursuing entrepreneurial initiatives and are thus more entrepreneurial (Rauch et al. 2009). Including firm size as a control variable will address the divergent views. Firm size will be measured using the natural log of the total number of employees at the time of the study (Covin et al. 2006; Casillas 2010).

TMT Age Diversity – A wide separation of ages within a team have been found to encourage personal conflict that can constrain the development and discussion of new innovative ideas (Pelled et al. 1999, Olson et al. 2006). Not controlling for the level of difference in age could confound the results and make the evaluation of the results difficult or incorrect. Age diversity, consistent with Olson et al. (2006), is measured by the coefficient of variation calculated as \( \frac{\sigma}{x} \), where \( \sigma \) is the standard deviation and \( x \) is the mean.

TMT Tenure – Carpenter et al. (2004) found that a higher average tenure of the TMT contributes to the performance of the company and increases the networking capabilities of the TMT members within the firm, but not outside the firm. “Specifically, firms led by long-tenured executives will tend to have (1) persistent, unchanging strategies, (2) strategies that conform closely to industry averages, and (3) performance that conforms to industry averages” (Finkelstein and Hambrick 1990, p. 486). In other words, long tenure tends to lead to organization inertia. TMT tenure is measured by dividing the total tenure of the complete team by the number of members.
Data Year – Due to the use of panel data, this study includes dummy variables representing each year to control for contemporaneous correlation (Certo and Semadeni 2006).

Analytical Method

The research question in the current study attempts to understand and explain whether the TMT demographic characteristics of industry and functional background heterogeneity and educational level positively influence the organization’s entrepreneurial orientation. It further explores the moderating influence that managerial discretion has on the TMT demographic background - EO relationship. The analytical model consists of one dependent variable, multiple independent variables, one moderator, and multiple control variables making multiple regression the most appropriate option for analysis (Hair et al. 2010). The moderation effect of managerial discretion is tested consistent with Baron and Kenny’s (1986) approach for testing moderation. In this study, the moderation is similar to Case 1 in Baron and Kenny (1986) in which the moderation is indicated by an interaction between the independent variable and moderator variable that affects the dependent variable.

RESULTS

The means, standard deviations and correlations of the model variables are shown in Table 4. Multicollinearity was tested by evaluating the variance inflation factors (VIF) within each model. Some control variables exceeded the threshold level of 10 for VIF indicating potential multicollinearity (Hair et al. 2010). Centering was applied to the interaction terms and the VIF readings were reduced to an acceptable level. In addition,
the correlations among the independent and control variable were considered as a second evaluation of multicollinearity problems. The results in Table 4 show no correlation greater than .5 indicating no multicollinearity problems (Hair et al. 2010).

### TABLE 4
**Description Statistics and Correlations**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. EO</td>
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<td>0.47</td>
<td>0.04</td>
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<tr>
<td>3. Dummy Year 2009</td>
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<td>-0.50**</td>
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<td>1.96</td>
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<td>0.01</td>
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* = p < 0.05; ** = p < 0.01

### TABLE 4 (Contd.)
**Description Statistics and Correlations**

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<td>-0.12**</td>
<td>0.14**</td>
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</tr>
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<td>Heterogeneity</td>
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<td></td>
</tr>
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<td>10. Educational</td>
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<td>0.01</td>
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<td>11. Managerial</td>
<td>4.74</td>
<td>1.32</td>
<td>0.10*</td>
<td>0.15**</td>
<td>0.02</td>
<td>0.20**</td>
<td>0.32**</td>
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<tr>
<td>Discretion</td>
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</tr>
</tbody>
</table>

* = p < 0.05; ** = p < 0.01

**Construct Validity - EO**

The computer-aided text analysis (CATA) method of measuring EO is becoming more popular because of the access to secondary level data used in the analysis as compared with the difficulty of gathering primary data through questionnaires (Short et
al. 2010). Even though CATA is growing in popularity as an alternative measuring technique, it is still a relatively new operationalization and therefore this study examines the convergent validity of the construct. Convergent validity tests the extent to which a measure of phenomena correlates with other measures of the same phenomena (Hair et al. 2010). Miller and Le Breton-Miller (2011) described R&D intensity as an alternate measure of innovation – one of the three elements of the summated measure of EO. The correlation of the EO construct employed in this study was tested in relation to the R&D intensity. The correlation was found to be positive (0.16) and significant at the p < 0.01 level, confirming the validity of the EO construct used in this study.

Construct Validity – Managerial Discretion

Due to the age (15 years) of the managerial discretion ratings in the Hambrick and Abrahamson (1995) tables, the construct validity of the rating was tested by two methods. First, as with EO, managerial discretion is made up of elements that together produce the individual rating. Therefore, convergent validity testing was performed by evaluating the correlations of the six elements used in Hambrick and Abrahamson’s (1995) study of managerial discretion – capital intensity, product differentiability, market growth, demand instability and quasi-legal constraint. A seventh determinant was identified in the Hambrick and Abrahamson (1995) study, but was later excluded due to availability of data. While the six determinants were identified in Hambrick and Finkelstein’s (1987) study in relation to organization-level factors, Hambrick and Abrahamson (1995) argued that the measures were also industry-level determinants. This study adapts a similar stance and uses the six determinants as an additional method for operationalizing
industry-level managerial discretion. In addition, as discussed next, this study adapts the measurement methods used in the Hambrick and Abrahamson (1995) study.

High capital intensity commits firms to long-term strategic directions and therefore restricts discretion. Capital intensity is measured as the net value of plant, property and equipment standardized by the number of employees across all industry participants for each of the five selected industries. Industries with high product differentiability allow a wider range of opportunities than commodity industries, providing greater managerial discretion. Hambrick and Abrahamson (1995) used both R&D and advertising intensity to determine product differentiability. In this study, only R&D intensity is used because of an inconsistency in the availability of advertising expense data. Therefore, product differentiability is measured as R&D expenditures divided by sales. High market growth industries provide more investment opportunities and thus offer higher levels of discretionary options. Market growth is measured as the average growth in sales of the total industry participants for the five years prior to and including 2007. High demand instability provides an environment for high managerial discretion due to uncertainty. Within stable demand industries decisions follow common patterns and are less discretionary. Demand instability is measured as the standard deviation of sales over the five years prior to and including 2007. Highly regulated industries have less discretion than those that are not highly regulated (Hambrick and Mason 1995). Similar to Hambrick and Abrahamson (1995), quasi-legal constraint is used to measure regulation. Quasi-legal constraint is measured using a text analysis method similar to Hambrick and Abrahamson (1995). The measurement is based on a word search of 10-Ks from all participant companies within their respective industry
based on the root word “regulat.” The total number of words across each industry was divided by the total words in the 10-K to standardize the counts.

The findings of the convergent validity based on the six elements described above are shown in Table 5. The high levels of significant correlations between the original managerial discretion and the six elements of 2007 managerial discretion confirm the use of the ratings from the Hambrick and Abrahamsen (1995) study. However, an additional step was taken to confirm that both operationalizations produce similar findings.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Managerial Discretion</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>2. Capital Intensity</td>
<td>-0.83**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Product Differentiability</td>
<td>0.93**</td>
<td>-0.85**</td>
<td></td>
<td></td>
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<td>4. Market Growth</td>
<td>-0.86**</td>
<td>0.94**</td>
<td>-0.74**</td>
<td></td>
<td></td>
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<tr>
<td>5. Demand Instability</td>
<td>-0.79**</td>
<td>0.95**</td>
<td>-0.70**</td>
<td>0.98**</td>
<td></td>
</tr>
<tr>
<td>6. Quasi-Legal Regulation</td>
<td>0.12**</td>
<td>0.03</td>
<td>0.10*</td>
<td>0.06</td>
<td>-0.03</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level

For the second test the elements of managerial discretion were used in the regression analysis in place of the rating from the Hambrick and Mason (1995) list. While the industry ratings changed somewhat, the findings were not demonstrably different from those of the original rating. Similar to the findings from the rating measure, educational level was the only predictor variable in which the managerial discretion interaction was significant (p < 0.05) and resulted in a closely similar increase the $R^2$. 
TABLE 6
Hypothesis Testing OLS Regression Results (Main Effects)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>H1</td>
<td>H2</td>
<td>H3</td>
<td>All IVs</td>
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<tr>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
</tr>
<tr>
<td>Control Variables</td>
<td></td>
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</tr>
<tr>
<td>Dummy Year 2008</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Dummy Year 2009</td>
<td>-0.02</td>
<td>-0.02</td>
<td>-0.02</td>
<td>-0.02</td>
<td>-0.02</td>
</tr>
<tr>
<td>Firm Age</td>
<td>-0.60***</td>
<td>-0.61***</td>
<td>-0.60***</td>
<td>-0.32**</td>
<td>-0.37***</td>
</tr>
<tr>
<td>Firm Age Squared</td>
<td>0.76***</td>
<td>0.76***</td>
<td>0.79***</td>
<td>0.49***</td>
<td>0.53***</td>
</tr>
<tr>
<td>Firm Size (ln # Employees)</td>
<td>-0.41***</td>
<td>-0.43***</td>
<td>-0.40***</td>
<td>-0.37***</td>
<td>-0.38***</td>
</tr>
<tr>
<td>TMT Age Diversity</td>
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<td>0.09</td>
<td>0.09**</td>
<td>0.03</td>
<td>0.04</td>
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<tr>
<td>TMT Tenure</td>
<td>0.09***</td>
<td>0.14***</td>
<td>0.15***</td>
<td>0.14***</td>
<td>0.12***</td>
</tr>
<tr>
<td>TMT Tenure Squared</td>
<td>-0.20***</td>
<td>-0.19***</td>
<td>-0.20***</td>
<td>-0.21***</td>
<td>-0.18***</td>
</tr>
<tr>
<td>Independent Variables</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Heterogeneity</td>
<td>0.08***</td>
<td></td>
<td></td>
<td>0.09**</td>
<td></td>
</tr>
<tr>
<td>Industry Heterogeneity</td>
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<td></td>
<td>0.24**</td>
<td></td>
</tr>
<tr>
<td>Industry Heterogeneity Squared</td>
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<td></td>
<td>-0.28**</td>
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<tr>
<td>Educational Level</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>R² / Adjusted R²</td>
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<td>0.27/0.26</td>
<td>0.28/0.26</td>
<td>0.39/0.38</td>
<td>0.40/0.39</td>
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<tr>
<td>F</td>
<td>27.51</td>
<td>25.90</td>
<td>23.49</td>
<td>43.19</td>
<td>34.55</td>
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</table>

* = p < 0.05; ** = p < 0.01; *** = p < 0.001

Hypotheses Tests

The hypotheses were tested via multiple regression analysis in nine different models. Model 1 tests the control variables of firm age, firm size, TMT age diversity, TMT tenure and Data Year. Models 2 through 4 test the predictability of the main-effect variables individually with EO and Model 5 tests the variables all together as presented in Table 6. Model 5 will be referenced for discussion of the main-effect hypotheses testing.
<table>
<thead>
<tr>
<th></th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
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<tr>
<td></td>
<td>H4 β</td>
<td>H5 β</td>
<td>H6 β</td>
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<tr>
<td>Control Variables</td>
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</tr>
<tr>
<td>Dummy Year 2008</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Dummy Year 2009</td>
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<td>-0.02</td>
<td>-0.02</td>
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<tr>
<td>Firm Age</td>
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<td>-0.57***</td>
<td>-0.29**</td>
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<tr>
<td>Firm Age Squared</td>
<td>0.71***</td>
<td>0.75***</td>
<td>0.45***</td>
<td>0.51***</td>
</tr>
<tr>
<td>Firm Size (ln # Employees)</td>
<td>-0.46***</td>
<td>-0.43***</td>
<td>-0.34***</td>
<td>-0.35***</td>
</tr>
<tr>
<td>TMT Age Diversity</td>
<td>0.08*</td>
<td>0.08**</td>
<td>0.02</td>
<td>0.03</td>
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<tr>
<td>TMT Tenure</td>
<td>0.15***</td>
<td>0.16**</td>
<td>0.14***</td>
<td>0.12***</td>
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<tr>
<td>TMT Tenure Squared</td>
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<td>0.19*</td>
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<tr>
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<td>-0.23**</td>
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<tr>
<td>Educational Level</td>
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<td>-0.28**</td>
</tr>
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<td></td>
<td>-0.02</td>
</tr>
<tr>
<td>Managerial Discretion x Industry Heterogeneity</td>
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<td>-0.05</td>
<td></td>
<td>-0.04</td>
</tr>
<tr>
<td>Managerial Discretion x Industry Heterogeneity Squared</td>
<td></td>
<td>-0.76</td>
<td></td>
<td>-0.03</td>
</tr>
<tr>
<td>Managerial Discretion x Educational Level</td>
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<td></td>
<td>0.35***</td>
<td>0.35***</td>
</tr>
<tr>
<td>R² / Adjusted R²</td>
<td>0.29/0.28</td>
<td>0.29/0.28</td>
<td>0.40/0.39</td>
<td>0.41/0.40</td>
</tr>
<tr>
<td>F</td>
<td>22.65</td>
<td>19.46</td>
<td>36.76</td>
<td>25.37</td>
</tr>
</tbody>
</table>

* = p < 0.05; ** = p < 0.01; *** = p < 0.001

Models 6 through 8 test the interaction of the predictors with managerial discretion separately and Model 9 tests all variables together. The results are shown in Table 7.

Control Variables

In Model 1 firm age resulted in an unexpected U-shaped curvilinear relationship with EO. Within the literature, researchers commonly take the log of the firm age to
avoid heteroscedasticity (Covin, et al. 2006; Casillas, et al. 2010). In this study, the natural log of firm age was significant ($\beta = -0.37, p < 0.001$) and produced a $\Delta R^2$ of 0.02. However, further testing revealed a curvilinear relationship on firm age and EO with a $\Delta R^2$ of 0.08 ($\beta = -0.35$ and $\beta$ of the squared term = 0.52, $p < 0.001$). Interpreting curvilinear effects can be difficult because multicollinearity can create problems with the statistical significance of the individual coefficients (Hair et al. 2010). Therefore, the test for curvilinear effects followed the three step process described in Hair, et al. (2010, p. 181) as follows:

“1. Estimate the original regression equation.
2. Estimate the curvilinear relationship (original equation plus polynomial term).
3. Assess the change in $R^2$. If it is statistically significant, then a significant curvilinear effect is present. The focus is on the incremental effect, not the significance of individual variables.”

The change in $R^2$ between the linear and the curvilinear relationships was significant at $p < 0.001$, confirming the curvilinear nature of the relationship. The signs of the coefficients present a U-shaped relationship indicating that sample firms are more entrepreneurially oriented during the earlier and later ages as represented in Figure 2.

Firm size presented a negative relationship with EO ($\beta = -0.38, p < 0.001$) indicating the larger the company the larger the company the less entrepreneurial the firm. Smaller firms are more agile and able to respond to entrepreneurial opportunities more quickly. Also, within smaller firms the TMT tends to wield more power to make
resource allocations to specific opportunities (Rauch et al. 2009). Larger firms tend to be cumbered with higher capital investments and larger organizational structures that constrain agile movements, innovation and risk taking (Rauch et al. 2009). On the other hand, arguments have been made that organization size is positively related to innovation (Bantel and Jackson 1989). While there is some disagreement, the findings are consistent with entrepreneurial researchers that claim smaller is better when it comes to a firm being more entrepreneurial.

TMT tenure also presented a significant curvilinear relationship with EO ($\beta = 0.12$, $p < 0.001$ and $\beta$ of the squared term = -0.18, $p < 0.001$). While the curvilinear relationship was not predicted it is consistent with other top management literature (Katz 1982; Carpenter 2002; Wu et al. 2005).
Hypotheses 1 and 2

Model 2 tests Hypothesis 1 (H1) that predicted that the functional background heterogeneity of the TMT would be positively related to EO. H1 was supported ($\beta = 0.09$, $p < 0.001$). Model 3 tests Hypothesis 2 (H2) in which industry background heterogeneity was argued to be positively related to EO. H2 was supported, however an interesting finding of the analysis was that industry background heterogeneity presented an inverted U-shaped relationship with EO. The change in $R^2$ from the linear to the curvilinear model was significant ($p < 0.001$) following the previously discussed method of evaluation, thus a significant curvilinear effect is present (Hair et al. 2010). The coefficient signs ($\beta = 0.24$ and the squared term $\beta = -0.28$) indicate an inverted-U relationship in which firms with low and high industry background heterogeneity will be less entrepreneurially oriented. Functional background heterogeneity should also present a similar curvilinear relationship. However, a test of the functional background heterogeneity-EO relationship did not produce a curvilinear condition. Functional diversity of TMTs happens naturally because of the common structure of the TMT has representation from the various functional areas and therefore would happen in high and low EO firms (Cannella et al. 2008). This is confirmed by the standard deviation of the functional heterogeneity. The observations are closely clustered versus the industry heterogeneity. Figures 3 and 4 present the scatter plot of the functional and industry heterogeneity data points.
Hypothesis 3

Model 4 tests Hypothesis 3 (H3) in which a positive relationship between the average level of education of the TMT and EO was predicted. H3 was supported ($\beta = \ldots$)
Average education level had the greatest predictive power or all the predictor variables with a $\Delta R^2 = 0.13$.

Hypotheses 4 - 6

Next, the moderating effect of managerial discretion was tested for each independent variable in Models 6 through 8 and all together in Model 9. The moderation effect of managerial discretion is tested consistent with Baron and Kenny’s (1986) approach for testing moderation. In this study, the anticipated moderation is similar to Case 1 in Baron and Kenny (1986) in which the moderation is indicated by an interaction between the independent variable and moderator variable that causes or affects the dependent variable. Hypotheses 4 (H4) and 5 (H5) posit a positive moderating effect of managerial discretion with functional and industry background heterogeneity, respectfully. H4 ($\beta = -0.02$, n.s.) and H5 ($\beta = -0.04$, n.s. and $\beta$ of the squared term = -0.03, n.s.) were not supported. Model 8 tests Hypothesis 6 (H6) that proposes a moderating effect of managerial discretion with education level. H6 ($\beta = 0.35$, $p < 0.001$) was supported.

Table 8 summarizes the results for all hypotheses.

Robustness Tests

The robustness of the current study was tested by several methods. First, the control variables were dropped from the models. The results were similar in significance and coefficient direction confirming the robustness of the main effects and moderated models.
TABLE 8
Hypotheses Testing Results

<table>
<thead>
<tr>
<th>Hypothesis 1</th>
<th>Functional background heterogeneity of the TMT is positively related to a firm’s entrepreneurial orientation.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supported.</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>Industry background heterogeneity of the TMT is positively related to a firm’s entrepreneurial orientation.</td>
</tr>
<tr>
<td></td>
<td>Supported.</td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td>Educational level average of the TMT is positively related to a firm’s entrepreneurial orientation.</td>
</tr>
<tr>
<td></td>
<td>Supported.</td>
</tr>
<tr>
<td>Hypothesis 4</td>
<td>Managerial discretion will moderate the relationship between TMT industry background heterogeneity and entrepreneurial orientation such that the higher the managerial discretion the more positive the relationship.</td>
</tr>
<tr>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>Hypothesis 5</td>
<td>Managerial discretion will moderate the relationship between TMT functional background heterogeneity and entrepreneurial orientation such that the higher the managerial discretion the more positive the relationship.</td>
</tr>
<tr>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>Hypothesis 6</td>
<td>Managerial discretion will moderate the relationship between TMT educational background heterogeneity and entrepreneurial orientation such that the higher the managerial discretion the more positive the relationship.</td>
</tr>
<tr>
<td></td>
<td>Supported.</td>
</tr>
</tbody>
</table>

Next, each variable was tested for normality to ensure the results were valid based on the assumption of normal distribution. The results indicated that all variables were within the tolerance for skewness and kurtosis except functional background heterogeneity which was skewed to the right. Because the skew was to the right, the first step to address the skewness was to reflect the variable by subtracting every observation value from a number greater than the highest value. Next, the square root of the reflected value was calculated to correct the skewness (Hair et al. 2010).
Lastly, the data were tested for outlier influence by running all models using a reduced sample of 1 and 2 standard deviations from the maximum and minimum values. The model coefficient directions and levels of significance were noticeably similar and therefore outliers are not considered to influence the model.

Endogeneity Tests

Endogeneity has become a concern because it is sometimes difficult to identify the direction of the causality (Shaver 1998; Miller 2011). Do TMT characteristics drive EO or does EO drive the TMT to be structured more diversely? Panel data were gathered in the current study to enable the longitudinal study of the variables and identification of any causality disputes. However, there also has to be a theoretical argument for a reverse causality in addition to the empirical findings. In the current study one would have to posit that because a firm is entrepreneurially oriented that it might attract a certain type of top manager. Hambrick and Mason (1984, p.197) stated “[t]he theory that managerial backgrounds impact strategic decisions is muddied further: Executives often are chosen precisely because they have the ‘right’ background or temperament to carry out actions hoped for by the board of directors or other controlling parties.” They further posited “[a]s with most macro-organizational theories, attention to causality is important. In fact, certain managerial backgrounds are expected to be a result of previous organizational actions.” (Hambrick and Mason 1984, p. 197) Although Hambrick and Mason (1984) conjectured these confounding conditions, there is no theoretical foundation for expecting endogeneity problems with the current study.
While there does not appear to be a theoretical reason for suspecting endogeneity, empirical tests were performed to ensure the directions of the research findings were not confounded. A two-stage least squares (2SLS) model was used to test whether the three variables of functional background heterogeneity, industry background heterogeneity and educational level could be measured as exogenous or endogenous variables (Semykina and Wooldridge 2010). Each variable was tested separately. The results of the functional and industry background models (Models 2 and 3) indicated that each should be treated as exogenous and that endogeneity does not appear to be biasing the model results. However, the educational level model (Model 4) results indicated an equal finding in both directions. While this might seem to be an issue, as mentioned above there is no theoretical footing from which to declare endogeneity to be an issue in the educational level model. Just because a firm has a higher level of EO does not intuitively drive educational level within the TMT. Therefore, the current study does not consider the conflicting results to indicate that endogeneity might be in play and bias the model findings.

DISCUSSION

Discussion of Findings and Implications

The current study has important implications for the strategic management research and role of managers in organizational outcomes. Four principle implications from the current study of how TMT characteristics relate to EO - The Influence of Heterogeneity, The Contribution of Education and The Consequences of External Forces - add to the upper echelons, managerial discretion, and EO literature. Each will be
discussed separately below. An additional implication – The Effects of Time - was discovered during the analysis and will be discussed last.

**The Influence of Heterogeneity**

First, the study finds that the level of EO that a firm exhibits is positively related the heterogeneity of backgrounds of the TMT, further confirming the positive answer to the question of whether TMTs matter in strategic decision-making (Hambrick and Mason 1984; Papadakis and Barwise 2002). The current study helps bridge a gap in the literature and answers the call by Miller (2011) for extended discussion on how a company establishes, strengthens and sustains an entrepreneurial orientation by presenting findings that the antecedents of functional, industry and educational backgrounds of the TMT are positively related to EO.

By bringing the well-founded upper echelons theory into the EO conversation this study points to how team effectiveness is not only important for team related performance, but can also have influence over the strategic direction of the firm. The results show that the composition of the team is indeed related to the entrepreneurial posture of the firm and thus provides some guidance as to how a firm can encourage and enhance its entrepreneurial orientation. As was previously argued in this study, the type and level of conflict will influence the decision-making process and outcomes of the team. In addition, the diverse backgrounds of the team members will enable the identification of greater numbers of opportunities through its expanded network. The heterogeneity of the functional and industry backgrounds of the team, which promotes task conflict and social networking, was found to positively influence EO. In an
entrepreneurial environment it is critical to have a pipeline of opportunities and the ability to sort through and select the ones with the greatest value or return. The educational level of the team provides greater capacity to absorb information, evaluate opportunities and implement the changes necessary to turn the opportunity into success (Carpenter and Fredrickson 2001; Daghfous 2004).

The unpredicted finding of a curvilinear relationship of industry background heterogeneity as shown in Figure 5 adds richness to the assessment of the positive relationship with EO. Although the inverted-U relationship of industry background heterogeneity with EO was not predicted in this study because no empirical findings had been previously presented, the finding supports the argument that too much or too little heterogeneity will have a negative influence over strategic decision making such as pursuing an entrepreneurial orientation (Eisenhardt et al. 1997). The results bear this out.
in that teams with very low and very high levels of industry heterogeneity were found to be less entrepreneurially oriented. The implication for top executives and board of directors is that managing the diversity of the team is critical to maintaining a higher level of EO. The findings provide guidance for hiring and promotion practices for organizations desiring to develop and maintain an entrepreneurial orientation.

The Contribution of Education

The educational level of the TMT is new to the EO stream. This study found that the educational level of the TMT is positively related to EO. While educational level has not been tested with the strategic posture of EO, it has been tested relative to innovativeness, an element of the measure of EO. Bantel and Jackson (1989) found that more highly educated TMTs generate more creative solutions to opportunities and are more receptive to change and innovation. On the other hand the findings are counter to Goll et al. (2008) who found that more educated TMTs contributed more to firm performance in industries under regulation. The positive moderation of education level with managerial discretion presents an opposite finding. The findings in the current study show that higher educated TMTs more positively influenced EO in environments with higher managerial discretion, or lower regulation. The difference could be related to the industries included in the two studies. Goll et al. (2008) tested their model only in the airline industry and evaluated the differences before and after deregulation. The current study included industries with varying levels and types of regulation, for instance pharmaceutical, airline and petroleum/natural gas production. Future studies should
extend the current study of the influence of education level on entrepreneurial orientation by including data from firms in other regulated and non-regulated industries.

The Consequences of External Forces

The last implication is a greater understanding of how managerial discretion constrains or permits the TMT to enact entrepreneurial initiatives. It was hypothesized that in industries with low discretion the TMT would have less opportunity to influence EO because strategic actions would be constrained. It was also hypothesized that in higher discretion industries the TMT would have more influence over the strategic actions of the firm and thus EO. Hambrick and Finkelstein (1987) presented these arguments in an effort to reconcile between the strategic management and population ecology theorists. The prevailing thought of the strategic management theorists is that executives influence an organization’s outcomes. On the other hand the population ecologist and institutional researchers posit the organizational outcomes are influenced by external forces and not by the firm’s executives. Hambrick and Finkelstein (1987) posited that the two theories can coexist based on context. While the moderation was founded in the literature, the findings show that only education level and managerial discretion interacted in a significant and positive manner to EO.

The Effects of Time

The relationship of firm age to EO shown in Figure 2 (shown earlier) presented a U-shaped relationship indicating that younger and older firms were more entrepreneurially oriented. While not surprising, the unpredicted curvilinear relationship is counter to other entrepreneurial studies in which relationships with firm age were
found to be linear (Covin, et al. 2006; Casillas, et al. 2010). The empirical finding of curvilinear relations between EO and firm age sheds new light on the difficulty for a firm to manage the level of EO over time. While the curvilinear finding is not consistent with other EO studies, from a theoretical standpoint the finding is consistent with organizational life cycle theory (OLC) as presented by Miller and Friesen (1984) which finds that a firm’s innovativeness and risk taking, elements of EO, changes over a firm’s life. In Miller and Friesen’s (1984) early Birth stage, also called the Entrepreneurial Stage by Quinn and Cameron (1983), the firm is characterized by substantial risk taking and high levels of innovation in product lines. In the next two stages the firm exhibits fewer entrepreneurial initiatives as it becomes more incremental in its innovation and begins to focus on efficiently addressing established markets. As growth begins to slow, the firm begins to take more risks and to diversify in the Rebirth stage in an attempt to regain the entrepreneurial growth experienced in the Birth stage. The stages of the OLC are shown in Table 9. An opportunity for future researchers is to complete a more in-depth study of how EO changes over the life of different organizations. A potentially interesting study would be to determine to what extent EO may have a life cycle similar to the OLC.

The curvilinear finding of TMT tenure to EO also should be considered for its managerial implications. The results presented in Figure 6 show that over the tenure of the TMT that EO changes in an inverted-U manner. Shorter TMT tenures present lower, but increasing EO until the apex is reached for the current study sample at approximately seven years where EO then begins to decline. The implications are straightforward for an organization interested in enhancing and maintaining higher levels of EO and therefore
performance. A firm might encourage turnover in the TMT such that the team tenure averages close to the seven year apex. The current study simply evaluates the average tenure of the TMT. Future research might investigate the diversity of member tenures within the TMT. As shown in the testing of other variables in this study, the diversity of tenures might encourage more critical evaluation of entrepreneurial opportunities resulting in successful implementations and thus higher performance.

In addition to the identification and understanding of curvilinear relations over the tenure of the TMT and age of the firm, this study adds to the EO and upper echelons literature through the inclusion of a panel data model that enabled longitudinal testing. Miller (2011) called for more studies of EO that considered the longitudinal issues including panel data designed studies. In addition, Hambrick (2007) called for more longitudinal studies in his recent article revisiting the upper echelons theory. This study
incorporates a panel data design over the years 2007 through 2009. Additional testing was performed to evaluate the relationship of the TMT characteristics with future entrepreneurial strategic postures. The 2007 TMT background characteristics were positively related to both the 2008 and 2009 EO. A significant reverse relationship was not found confirming the direction of the relationship. However, the strength and significance of the relationships with each of the predictors changed over the time period as shown in Table 10. A potential cause could be the change in the environment. During the three year period of the panel data, the economic conditions negatively changed. In

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<th>2007 EO</th>
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<tr>
<td>Firm Age</td>
<td>-0.40*</td>
<td>-0.46**</td>
<td>-0.31*</td>
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<td>0.57***</td>
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<tr>
<td>Firm Size (ln # Employees)</td>
<td>-0.38***</td>
<td>-0.39***</td>
<td>-0.35***</td>
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<td>TMT Age Diversity</td>
<td>0.01</td>
<td>0.10*</td>
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<td>0.14*</td>
<td>0.12*</td>
<td>0.07</td>
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<td>TMT Tenure Squared</td>
<td>-0.21***</td>
<td>-0.14*</td>
<td>-0.10</td>
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<td><strong>Independent Variables</strong></td>
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<td>Functional Heterogeneity</td>
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<td>0.12*</td>
<td>0.12*</td>
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<tr>
<td>Industry Heterogeneity</td>
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<td>0.23</td>
<td>0.10</td>
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<tr>
<td>Industry Heterogeneity Squared</td>
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<td>-0.25</td>
<td>-0.19</td>
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<td>Educational Level</td>
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<td>0.32***</td>
<td>0.40***</td>
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<td>$F$</td>
<td>13.34</td>
<td>13.76</td>
<td>15.21</td>
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* = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$
the less favorable economic conditions the educational level became a more powerful predictor, functional background became less significant and industry background became insignificant. This supports the argument that more educated managers are more receptive to the innovation and change required during declining economic conditions (Bantel and Jackson 1989; MacCrimmon and Wehrung 1990). Different approaches are required when the environment changes significantly. In this case, the economy fell into recession creating the need to respond with non-normal, innovative approaches. Future studies should compare the TMT to EO relationship in lagged models that span normal, declining and increasing economic climates.

Limitations and Suggestions for Future Research

There are limitations in this study that should be considered when interpreting the results. First, because the data are limited to five industries the findings may not be generalizable. Future studies should consider a sample across a broader selection of industries. The difficulty of such an endeavor would be the determination of managerial discretion across multiple industries. Even though data may not be available to test the full model including the moderation of managerial discretion, the findings of the main effect of TMT background characteristics relationship with EO provide a fertile ground for additional studies in a broader context.

A second limitation is that the panel data spanned three years. While some lag effects were noted, a longer longitudinal period might produce more insightful findings. The findings show that the relationship between the top team and entrepreneurial orientation remained positive and in some cases improved. However, as stated earlier,
the significance of the TMT background characteristics varied across the years. Some became insignificant. Although the three years included in this study were controlled for by using dummy variables, the time spanned included a period in which the nation began to fall into recession. Thus a future study might consider a wider span and the relations prior to, during and after the crisis to determine effects within different economic conditions.

Third, the use of CATA methodology used for operationalizing EO may be viewed as less than desirable. The CATA measurement technique is an increasingly popular technique that has proven to be a valuable method within the management and entrepreneurship fields because it allows researchers to determine executive attitudes, beliefs and decision-making in an unobtrusive manner. The validity of the construct was tested using established methods resulting in confidence in the measure of EO. Future research may consider alternative methods for measuring the EO construct and possibly comparing the multiple methods.

Lastly, the results of the current study indicate a low level of explanatory power ($\Delta R^2 = 0.02$, p < 0.001) for functional and industry background heterogeneity. One explanation for the low explanatory power is that the current study examined a limited number of the many complex TMT background characteristics. While the characteristics included in this study are considered important to understanding how the TMT influences EO, there is much more to understand. Therefore, the findings in this study are considered advancements in the managerial and entrepreneurial literature that can be further enhanced by exploring the relationship of other TMT background characteristics
with EO. Future studies should expand into other characteristics including gender and minority statuses.

Conclusion

In conclusion, this study adds to the EO, upper echelons and managerial discretion conversations by answering the question of whether top management teams drive the strategic orientation of the firm. While the predictor variables are a few of the many elements that influence the entrepreneurial orientation of the firm, it provides a good start to a fuller understanding of how a firm might develop and sustain such an orientation. The results also confirm that you can have too much or too little diversity in a team to reach an entrepreneurial orientation. Thus, the results provide some guidance for the management and governance of the firm in relation to team structure. Based on the findings, a properly diversified team will enable the maintenance and enhancement of an entrepreneurial orientation through the identification of a steady flow of entrepreneurial opportunities, ability to evaluate the opportunities, and skills and knowledge to implement them successfully.
REFERENCES


Management Science. 29(7): 770-791.


Miller D. and I. Le Breton-Miller (2011). "Governance, Social Identity, and
Entrepreneurial Orientation in Closely Held Public Companies."
Entrepreneurship: Theory & Practice. 35(5): 1051 - 1076.


Review. 16(2): 44-53.


Organizational Advantage." Academy of Management Review. 23(2): 242-266.


CHAPTER 3
ESSAY 2
THE RELATIONSHIP BETWEEN CEO TENURE AND ENTREPRENEURIAL ORIENTATION WITHIN FAMILY AND NON-FAMILY FIRMS

ABSTRACT

This study examines how CEO tenure relates to entrepreneurial orientation (EO) in family and non-family firms. It is argued that the level of EO is lower in the early and late stages of the CEO’s tenure and higher in the middle stage tenure in an inverted-U relationship. There have been opposing findings of whether family firms are more entrepreneurial than non-family firms. It has also been found that CEOs in family firms make strategic decisions differently than CEOs in non-family firms. This study adds to both discussions by examining the relationship of CEO tenure to EO in family versus non-family firms. It is posited that EO will be greater within family firms in the early stage and more negative in the later stage of CEO tenure when compared to non-family firms. The relationships are tested using a selection of 210 publicly traded companies across multiple industries for the years 2007 - 2009. The findings support the argument of an inverted-U relationship between CEO tenure and EO. The findings also support the argued difference in the CEO tenure-EO relationship in family versus non-family firms.
INTRODUCTION

Miller (1983) described firm-level innovativeness, proactiveness and risk taking as elements of the strategic posture that is now known as entrepreneurial orientation (EO). Researchers following Miller’s (1983) work have found positive connections between EO and many critical organizational outcomes including growth (Covin et al. 2006; Moreno and Casillas 2008; Casillas 2010), new venture creation (Ensley and Pearson 2005; Nordqvist 2005; Lumpkin et al. 2006) and financial performance (Covin and Slevin 1989; Covin and Slevin 1991; Lumpkin and Gregory 2001; Wang 2008; Rauch et al. 2009). The extensive body of evidence demonstrating a positive relationship of EO with organizational outcomes has encouraged scholars to further study EO to identify and examine potential antecedents (Miller 2011). This study presents CEO tenure as an antecedent to EO.

Researchers have attempted to answer whether CEOs matter to organizational outcomes; however, the findings have been mixed (Pfeffer 1977; Finkelstein and Boyd 1998; Waldman et al. 2001; Papadakis and Barwise 2002; Crossland 2009; Haynes and Hillman 2010). The CEO is commonly recognized as the person who is responsible for the management of the organization and therefore the CEO’s actions are of concern for the organization and stakeholders (Pfeffer 1977; Finkelstein and Hambrick 1996). While many researchers have examined the relationship of leadership traits and styles (Pfeffer 1977; Carpenter et al. 2004; Judge and Piccolo 2004) to firm performance, there are limited empirical studies on the relationship of CEO tenure to the strategic posture of the firm, especially in terms of an entrepreneurial orientation. Researchers have found CEO tenure to be positively related to firm performance (Simsek 2007), firm value (Brookman...
and Thistle 2009), strategic change (Zhang and Rajagopalan 2010), commitment to the status quo (Musteen et al. 2006) and innovation (Wu et al. 2005). The foundation for the relationship of CEO tenure to EO emerges from the management literature. For example, Wu et al. (2005) found CEO tenure to be positively related to invention. They further posited that success in the invention process requires innovativeness, risk taking and proactiveness. Simsek (2007) found that CEO tenure is related to a firm’s entrepreneurial pursuits.

Although there has been some disagreement, generally the CEO’s attitude toward and power to affect the strategic posture of the organization are found to vary over the tenure of the CEO forming an inverted-U relationship such that outcomes first improve with CEO tenure up to a certain threshold beyond which outcomes deteriorate. Previous studies have found an inverted U-shaped relationship between CEO tenure and firm performance (Miller 1991), invention (Wu et al. 2005) and risk taking (Simsek 2007). Miller (1991) argued that over time CEOs lose touch with their environment and fail to recognize or feel the need to pursue innovative and risky initiatives. “The longer a CEO’s tenure in office, the more likely it is that he or she will have the influence, autonomy and desire to resist external pressures for change” (Miller 1991, p.34). As CEOs move “farther into the ‘domain of gains’ and the marginal benefit of additional gains is outweighed by the risk of losing prior gains, long-tenured CEOs become risk-averse” (Simsek 2007, p.655). Thus, a CEO in the later stages of his or her tenure may avoid decisions to pursue entrepreneurial initiatives that involve higher levels of risk and uncertainty.
In the earlier stages of a CEO’s tenure, he or she may be more willing to proactively pursue risky and innovative change based on the CEO’s paradigm or thought patterns. However, the level and type of changes may be somewhat limited due to less knowledge of the firm, limited human capital from internal contacts and restrictions on resource reallocation (Hambrick 1991). As the early-tenure CEO gains more knowledge and power he or she becomes more willing to initiate new entrepreneurial efforts. Hambrick (1991) described each CEO as having a paradigm that forms the basis for their actions or lack thereof. Over the tenure of an executive his or her paradigm (the basis for decision making and actions) may change based on experiences and other learning opportunities. It is argued that as the CEO’s paradigm changes over his or her tenure that the CEO’s desire to pursue entrepreneurial opportunities will also change. This study tests for a similar non-linear condition in which the relationship of CEO tenure to EO is more positive in the middle of the CEO’s tenure than during the early or later times.

This study argues that the CEO tenure-EO relationship will be moderated by a firm ownership-related variable – in particular, whether the firm is family or non-family owned. A limited number of EO studies have focused on influential aspects related to firm ownership types (Short et al. 2009). The limited study of EO in family firms is astonishing given that family ownership is prevalent around the world (La Porta et al. 1999; Astrachan et al. 2003). Also, over one-third of the Fortune 500 firms are family firms (Anderson and Reeb 2003). The challenges and decision-making requirements of firm leaders are different in family versus non-family firms. For the family firm CEO, decisions and outcomes of the family and business run parallel. When one does well the other does well and the same is true when one does poorly (Rogoff and Heck 2003).
Because of the link between the family and business, family firm CEOs must consider not only business situations, but must also address family concerns in their decision making (Aldrich and Cliff 2003; Ensley and Pearson 2005; Lumpkin et al. 2008; Sharma 2008).

The tenure of family firm CEOs tends to be longer than the tenure of non-family firm CEOs (Le Breton-Miller and Miller 2006). Family firm CEOs commonly pursue longer-term goals focused on asset accumulation and preservation (Le Breton-Miller and Miller 2006). On the other hand, researchers have found that family firms are more risk averse than non-family firms (Le Breton-Miller and Miller 2006). Longer-tenured CEOs have been found to avoid risky changes (Hambrick and Fukutomi 1991). However, Zahra (2005) posited that because the family firm CEO is more long-term focused, he or she is more willing to invest the infrastructure and systems to support the pursuit of risky opportunities. Furthermore, Zahra (2004) found family firms to be more entrepreneurial when compared with non-family firms. It is argued in this study that the family versus non-family ownership types will moderate the relationship between CEO tenure and EO such that the anticipated curvilinear relationship is more positive in the early stages of tenure and more negative in later stages of tenure in family firms compared to non-family firms.

The remainder of the paper is structured as follows. The next section provides a summary of the most prominent literature addressing the concept of EO and its relationship with the CEO tenure in family and non-family firms. A conceptual model and hypotheses are developed in this section. The second section discusses the methods of collecting the sample data, operationalization of the variables, and the analyses.
employed. The final section discusses the implications of the findings, limitations of the study, and recommendations for further research.

THEORETICAL BACKGROUND

Entrepreneurial Orientation

Miller (1983) defined what has become known as entrepreneurial orientation (EO) as a strategic posture in which a firm “engages in product-market innovation, undertakes somewhat risky ventures, and is the first to come up with ‘proactive’ innovations, beating competitors to the punch” (Miller 1983, p.771). Since that time, innovativeness, risk-taking and proactiveness have become the prominent dimensions of EO. Innovativeness is demonstrated through the introduction of new products/services and processes. Risk taking is demonstrated though large resource commitments and heavy debt (Lumpkin and Dess 1996). Proactiveness is demonstrated through aggressive opportunity-seeking for competitive advantage (Miller 1983; Covin and Slevin 1989; Rauch et al. 2009).

Lumpkin and Dess (1996) added competitive aggressiveness and autonomy as two additional dimensions. Competitive aggressiveness is defined as a firm’s actions to directly challenge competitors in an attempt to outperform rivals. Autonomy is revealed through independent actions by an individual taken in the pursuit and execution of entrepreneurial opportunities. The three-dimension construct of innovativeness, risk taking and proactiveness has been used by the majority of researchers to define EO (Rauch et al. 2009). This study will follow the majority of researchers and rely on the original three dimension construct to define EO.
In addition to the discussion of the elements of EO, whether EO should be considered unidimensional or multidimensional has also been a topic of debate. Lumpkin and Dess (1996) described EO as consisting of five elements that could exist independently or together. In other words, the Lumpkin and Dess (1996) conceptualization of EO argues that the five dimensions do not necessarily need to covary in the measurement of EO and that each element should be considered an individual construct. For example, in their conceptualization risk taking could be very high and the other elements very low or non-existent for a firm to be considered entrepreneurially oriented. The Miller (1983)/Covin and Slevin (1989) conceptualization on the other hand argues that the dimensions of EO must coexist and covary in determining whether a firm is entrepreneurially oriented. Covin and Wales (forthcoming) posited that both conceptualizations are viable considerations for the measurement of EO depending on the purpose of the study. The use of the Lumpkin and Dess (1996) conceptualization should include the theoretical foundation for the relationship of the predictor variable to each outcome variable. This study evaluates EO as a single outcome variable and therefore the Miller (1983)/Covin and Slevin (1989) conceptualization, including the innovativeness, risk taking and proactiveness elements, will be used.

Top managers, including the CEO, drive the strategic posture of the firm, such as an entrepreneurial orientation, through their decision making and actions (Covin and Slevin 1988). Hambrick and Mason (1984) stated that the background characteristics of the CEO, including his or her tenure, influence their decision making and actions. Thus, it is proposed that the tenure of the CEO will influence the entrepreneurial orientation of the firm through his or her entrepreneurial decision making and actions.
CEO Tenure

The CEO is commonly recognized as the leader of a firm and is intimately involved in setting the strategic direction and orientation of the firm (Finkelstein and Hambrick 1996). Over the years, researchers have studied the characteristics of the CEO in an effort to identify predictors of firm success. One such characteristic is CEO tenure. CEO tenure, defined as the time spent by a CEO in his or her current position, has been related to many organizational conditions and outcomes including firm performance (Simsek 2007), firm value (Brookman and Thistle 2009), strategic change (Zhang and Rajagopalan 2010), commitment to the status quo (Hambrick et al. 1993; Musteen et al. 2006), innovation (Wu et al. 2005) and risk taking (Miller 1993).

Hambrick and Fukutomi (1991) described how each CEO has a paradigm made up of a personal schema and repertoire. The schema of a CEO is a preexisting knowledge system derived through his or her previous experiences and knowledge development. A CEO’s repertoire is his or her toolbox of skills and approaches to business situations. The paradigm forms the basis for a CEO’s actions or lack thereof (Hambrick and Fukutomi 1991). Over the tenure of an executive, his or her paradigm may change based on experiences and other learning opportunities (Miller 1991). It is argued that these paradigms will change over a CEO’s tenure such that his or her desire and ability to pursue entrepreneurial opportunities will change accordingly.

Henderson et al. (2006) posited that CEOs pass through two phases during their tenure. During the initial portion of the first phase, the CEO is adapting to his or her new position and the environment. In the beginning, the CEO knows what he or she has been
asked to do, but the ability to identify and implement entrepreneurial opportunities is limited because of a low level of knowledge about the company and its environment. In addition, the organizational inertia remaining from the previous administration and the lack of organizational power the new CEO may have inhibits his or her ability to make innovative, risk taking and proactive change. The CEO’s ability to effect the change necessary to move the organization to a greater entrepreneurial posture increases as he or she grows in knowledge and power until it peaks before moving into the next phase (Henderson et al. 2006; Kellermanns and Eddleston 2006). However, as CEO begins the second phase, performance declines because the CEO’s decision making increasingly relies on his or her earlier formulas for success. The result is a more conservative and reactive organization. Furthermore, the CEO becomes less aware of his or her environment and becomes increasingly incapable of identifying new innovative and proactive entrepreneurial opportunities (Henderson et al. 2006). Throughout his or her tenure the CEO has continued to gain the organizational power that enables him or her to hold to the status quo in the later phase. The result is a departure from the entrepreneurial posture the firm had enjoyed earlier in the CEO’s tenure (Henderson et al. 2006). To support his or her position long-tenured CEOs hire supporters that follow the established position and eliminate others that disagree (Miller 1991). These two phases are consistent with other studies that have discovered an inverted-U relationship between CEO tenure and invention (Wu et al. 2005) and risk taking (Simsek 2007). Based on the findings from the literature, the following hypothesis is presented.
Hypothesis 1: CEO tenure exhibits an inverted-U relationship to EO such that early and late-stages of tenure are associated with lower levels of EO, while the middle-stage of tenure is associated with higher levels of EO.

Family and Non-Family Ownership Types

It has been found by many researchers that family firms are different from non-family firms in their performance goals (Anderson and Reeb 2003), planning horizons (Kellermanns and Eddleston 2006), management styles (Le Breton-Miller and Miller 2006), conflicts (Anderson and Reeb 2004; Eddleston et al. 2008), social capital (Pearson et al. 2008), risk taking (Naldi et al. 2007) and entrepreneurial posture (Zahra 2005; Marchisio et al. 2010). However, the findings of studies evaluating differences between family and non-family firms in relation to performance, entrepreneurial posture, risk taking, innovation and many other organizational outcomes have been mixed (Anderson and Reeb 2003; Anderson and Reeb 2004; Miller et al. 2007). Not all family firms focus on longer-term performance outcomes, but generally their focus is longer-term than that of non-family firms (Anderson and Reeb 2004; Kellermanns et al. 2008). The longer-term focus of family firms has been found to be a performance advantage, but may also cause family firms to be less aggressive than their non-family counterparts (Kellermanns and Eddleston 2006). In the same vein, some family firms have been found to take less risk. Naldi et al. (2007) found that while family firms exhibited EO, they tended to be less risk taking than non-family firms. They suggested that the concern for the family’s long-term wealth preservation and growth was the cause for the lower level of risk taking. Gomez-Mejia et al. (2007) argues that family firms approach risk taking differently than non-family firms in their study of family firms’ socioemotional wealth.
Socioemotional wealth is the “non-financial aspects of the firm that meet the family’s affective needs, such as identity, the ability to exercise family influence, and the perpetuation of the family dynasty” (Gomez-Mejia 2007, p. 106). It was found in their study that family firms are willing to take risk and are risk averse at the same time.

“Perhaps a more accurate depiction is that an important criterion of success for these firms is that they be able to exercise family influence and avoid socioemotional losses, which might prompt owners to make risky business decisions with a high probability of negative outcomes. From the owners’ point of view, this could be seen as a rational strategy to pursue a key non-financial objective despite its potential downside. Thus many family firms around the world emerge and survive through generations not because they are the most efficient or most profitable form of organization but because they meet the socioemotional needs of their owners” (Gomez-Mejia 2007, p.134).

Other researchers have found family firms to be more entrepreneurial. Zahra et al. (2004), for instance, found that family ownership promotes entrepreneurship. Astrachan et al. (2003) acknowledged that the ownership structure of family firms ensured the alignment of family and business goals creating an environment suited for new business and technology development. Family firms grow out of the entrepreneurial spirit of the founder and therefore are considered to be more entrepreneurial (Salvato 2004). Cruz and Nordqvist (2010) found that third and beyond generation family firms are more entrepreneurial. Others have argued that second and third generation family firms are not as entrepreneurial as the first generation. These contradicting findings
provide an opportunity for further examination of how family firm CEOs’ decisions and actions change differently during their tenure compared to non-family firm CEOs.

One important difference between CEOs in family versus non-family firms is the average length of tenure. Family firm CEO tenures are three to five times the length of a non-family firm CEO (Le Breton-Miller and Miller 2006). Long tenures for non-family firm CEOs are not as prevalent and tenure lengths have been decreasing over the past years. If the CEO in a non-family firm does not fit well with the organization and fails to provide the expected outcomes, he or she can be more easily removed from office. The risk of termination is high in the beginning, but the longer the tenure the lower the probability of termination (Brookman and Thistle 2009). The “hazard” of being terminated peaks at about five years and then decreases (Brookman and Thistle 2009). Other CEOs voluntarily leave in the early part of their tenure, usually because there is not a good match between the CEO and the firm requirements (Brookman and Thistle 2009). On the other hand, within the family firm the CEO is commonly entrenched due to family connections. Termination in the early stage of his or her tenure is independent of performance (Allgood and Farrell 2000). In addition, the longer tenure of the family CEO enables him or her to develop a strong organizational power base from which he or she can execute their plans. As previously stated, long tenures have been associated with following the status quo (Miller 1991). Firms that avoid risk taking can fall into a comfort zone and face stagnation from pursuing the status quo (Kellermanns et al. 2008). However, Zahra (2005) posited those long-tenured CEOs in family firms are willing to take chances beyond the status quo.
In summary, the CEOs from family and non-family firms face different pressures, expectations and challenges. The family firm CEO tenure is longer, but he or she must face pressures not only from the business environment, but must also consider the family at the same time. In contrast, the non-family firm CEO faces greater pressure early in his or her tenure due to termination risk and short-term performance expectations. Family and non-family firm CEOs have been found to be more wedded to the status quo in the later stages of their tenure. However, the desire to maintain socioemotional wealth later in his or her tenure may cause the family firm CEO to exercise family influence and make risky business decisions with a high probability of failure. Therefore, it is posited in this study that the family and non-family firm ownership types will moderate the CEO tenure to EO relationship such that the shape of the curvilinear relationship will be different when comparing family firm CEO tenure with non-family firm CEO tenure. It is further argued that the curvilinear relationship will be more positive in the early stage and more negative in the later stage of the CEO tenure in family firms compared to non-family firms. Based on the presented literature the following hypothesis is proposed.

Hypothesis 2: Ownership status (i.e. family vs. non-family) will moderate the inverted U-shaped relationship between CEO tenure and EO such that the positive effect of CEO tenure on EO among firms with short-tenured CEOs will be more positive, and the negative effect of CEO tenure on EO among firms with long-tenured CEOs will be more negative, among family firms than non-family firms.

A figure of the conceptual framework that illustrates the hypotheses is shown below.
The lighter colored straight line is shown because when investigating anticipated curvilinear relationships it is necessary to account for a possible linear relationship as well (Hair et al. 2010).

METHODS

Data Collection

Data were collected for 210 publicly traded family and non-family firms from Capital IQ, Wharton Research Data Services (WRDS) and Board Analyst, widely used databases for company-wide information. Also, when needed for confirmation or additional information, individual company websites and 10-Ks were referenced. Eighty-five of the 210 firms were classified family firms. The data are selected in a panel method for the years 2007-2009 resulting in 630 observations (255 family firm observations). The sample size is sufficient based on the guidelines of 15 to 20
observations for each predictor variable set out in Hair et al. (2010). Private firms are not included in the sample collection of firms because the operationalization of EO discussed below requires annual reports that are not readily available for private firms. The use of information published in subscription databases is consistent with other social science studies (Finkelstein and Hambrick 1990; Pearce and Zahra 1992; Anderson and Reeb 2004).

Entrepreneurial Orientation (Dependent Variable)

Content analysis of 10-K annual reports is used to operationalize EO. Content analysis of corporate texts such as shareholder letters, press releases, 10-Ks and annual reports is an unobtrusive technique of data collection that is growing in popularity (Short et al. 2010). Content analysis is a rigorous process of gathering data which is otherwise difficult to obtain. The primary assumption behind this combined qualitative and quantitative method is that it recognizes that through the language used one can develop an understanding of the cognitive schemas of management (Duriau et al. 2007).

This study employs Computer-Aided Text Analysis (CATA) to process annual reports of the selected samples consistent with the procedure outlined by Short et al. (2010). LIWC2007, a CATA software package, is used to read 10-K text files of the selected firms and obtain a count of words that match a custom dictionary developed and tested by Short et al. (2010) for the use in determining EO. The words from the custom EO dictionary shown in Table 1 were deductively-derived based on prior EO literature. Short et al. (2010) first developed an exhaustive list of words in an effort to capture the full theoretical domain of each EO dimension. Following the procedure recommended
TABLE 1
Dictionary Words for Entrepreneurial Orientation Dimensions
Adapted from

<table>
<thead>
<tr>
<th>EO Dimension</th>
<th>Dictionary Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness</td>
<td>Ad-lib, adroit, adroitness, bright-idea, change, clever, cleverness, conceive, concoct, concoction, concoctive, conjure-up, create, creation, creative, creativity, creator, discover, discoverer, discovery, dream, dream-up, envisage, envision, expert, form, formulation, frame, framer, freethinker, genesis, genius, gifted, hit-upon, imagination, imaginative, imagine, improvise, ingenious, ingenuity, initiative, initiator, innovate, innovation, inspiration, inspired, invent, invented, invention, inventive, inventiveness, inventor, make-up, mastermind, master-stroke, metamorphose, metamorphosis, neoteric, neoterism, neoterize, new, new-wrinkle, innovation, novel, novelty, original, originality, originate, origination, originative, originator, patent, radical, recast, recasting, resourceful, resourcefulness, restyle, restyling, revolutionize, seethings, think-up, trademark, vision, visionary, visualize</td>
</tr>
<tr>
<td>Proactiveness</td>
<td>Anticipate, envision, expect, exploration, exploratory, explore, forecast, foreglimpse, foreknow, foresee, foretell, forward-looking, inquire, inquiry, investigate, investigation, look-into, opportunity-seeking, proactive, probe, prospect, research, scrutinization, scrutiny, search, study, survey</td>
</tr>
<tr>
<td>Risk taking</td>
<td>Adventurous, audacious, bet, bold, bold-spirited, brash, brave, chance, chancy, courageous, danger, dangerous, dare, daredevil, daring, dauntless, dicey, enterprising, fearless, gamble, gutsy, headlong, incautious, intrepid, plunge, precarious, rash, reckless, risk, risky, stake, temerity, uncertain, venture, venturesome, wager</td>
</tr>
</tbody>
</table>

by Neuendorf (2002), each deductively-derived word list was mutually exclusive having each word pertaining to only one theoretically intended construct and includes synonyms and derivations of each word. Next, two entrepreneurship scholars refined the list to
determine each word’s applicability to the dimension’s conceptual definition. Inter-reliability of the coding scheme ranged from $r = 0.75$ to $r = 0.88$ across all dimensions (Short et al. 2010).

An additional step was required to standardize the initial word counts because annual reports are of different lengths. Therefore, the raw word counts were divided by the total word count in the 10-K yielding a standardized value. The standardized values for all three dimensions of innovativeness, risk-taking and proactiveness were summed to create a measure of the firm’s EO score. Higher scores indicate a greater entrepreneurial orientation and lower scores a more conservative orientation.

CEO Tenure (Independent Variable)

CEO tenure is operationalized as the number of years in which the CEO has been employed in their current position.

Family and Non-Family Ownership Types (Moderating Variable)

Family and non-family ownership types are operationalized as a dummy variable of 1 for family firm and 0 for non-family firm. Family firm is broadly defined as a firm in which the founder or one or more of his or her relatives maintain any fractional ownership position greater than zero and/or the presence of the founder or a relative of the founder on the board of directors (Anderson and Reeb 2003). All other firms are designated as non-family.
Control Variables

Firm Age – During the life of an organization the make-up and level of EO may change. Controlling for the age of the firm is necessary to ensure that we are measuring EO effects and not age effects. Firm age is operationalized as the life of the firm based on its recorded established date (Covin et al. 2006; Casillas 2010).

Firm Size – Firm size was chosen as a control variable for this study to address two concerns. It has been argued that larger firms are assumed to have more resource availability to pursue entrepreneurial opportunities (Bantel and Jackson 1989). However, it has also been argued that smaller firms are more agile and can pursue entrepreneurial initiatives with more speed and success (Rauch et al. 2009). Firm size is measured using the natural log of the total number of employees at the time of the study (Covin et al. 2006; Casillas 2010).

Data Year – This study includes dummy variables representing each year to control for contemporaneous correlation that might exist due to the use of panel data (Certo and Semadeni 2006).

Environmental Dynamism is included as a control variable because it has been found that EO tends to be greater in dynamic environments (Miles et al. 2000). Controlling for the environmental dynamism is necessary to ensure that we are measuring EO effects and not environmental effects. Consistent with Hambrick and Cannella (2004) environmental dynamism is operationalized using the elements of industry growth and industry stability. Industry growth is calculated as the median rate of sales growth between t-2 and t. Industry stability, an indicator of unpredictable growth or shrinkage in
the industry, is measured as the absolute difference in the industry growth rate from t-2 to t-1 vs. t-1 to t. The measures of the two elements were summed for an overall environmental dynamism measure.

Analytical Method

The research question in the current study attempts to understand and explain whether the tenure of the CEO positively influences the organization’s entrepreneurial orientation. It further explores the moderating influence that family versus non-family ownership has on the CEO tenure-EO relationship. The analytical model consists of one dependent, one independent and multiple control variables. The model structure makes multiple regression the most appropriate option for the analysis (Hair et al. 2010). Baron and Kenny’s (1986) approach for testing moderation was followed to test the moderating effect of family vs. non-family ownership type. In this model, the moderation is indicated by an interaction between CEO tenure and family versus non-family ownership that affects the dependent variable, similar to Baron and Kenny’s (1986) Case 1.

RESULTS

Table 2 presents the means, standard deviations and correlations of the study variables. Multicollinearity was tested by evaluating the variance inflation factors (VIF) within each model. In the moderation model some VIF scores exceeded the acceptable score of 10 (Hair et al. 2010). The mean centering method was applied (Smith and Sasaki 1979) and the resulting VIF scores were within the tolerance (Hair et al. 2010). In addition, the correlations among the independent and control variable were considered as a second evaluation of multicollinearity problems. The results shown in Table 2 show
one variable, Dummy Year 2009 at 0.5 which is a borderline, but acceptable level (Hair et al. 2010). No other correlation is greater than .5 indicating no multicollinearity problems (Hair et al. 2010). Endogeneity tests were performed during testing of the hypotheses.

TABLE 2
Descriptive Statistics and Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Year Dummy 2008</td>
<td>0.33</td>
<td>0.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Year Dummy 2009</td>
<td>0.33</td>
<td>0.47</td>
<td>-0.50*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Firm Age</td>
<td>26.55</td>
<td>23.72</td>
<td>0.03</td>
<td>-0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Firm Size</td>
<td>6.83</td>
<td>1.96</td>
<td>0.02</td>
<td>-0.01</td>
<td>0.46*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Environmental Dynamism</td>
<td>0.57</td>
<td>0.34</td>
<td>-0.36</td>
<td>0.01</td>
<td>0.02</td>
<td>-0.41*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CEO Tenure</td>
<td>8.77</td>
<td>6.91</td>
<td>0.03</td>
<td>-0.00</td>
<td>-0.05</td>
<td>-0.08</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>7. EO</td>
<td>0.73</td>
<td>0.18</td>
<td>0.04</td>
<td>-0.04</td>
<td>-0.07</td>
<td>-0.37*</td>
<td>0.37*</td>
<td>-0.00</td>
</tr>
</tbody>
</table>

* = p < 0.05; ** = p < 0.01

Construct Validity - EO

EO was measured using computer-aided text analysis (CATA), a technique growing in popularity because of its use of secondary data and non-invasive nature. Although CATA is growing in popularity, it is still a relatively new measuring technique in the management field. Therefore, to alleviate any concern this study also examines the convergent validity of the construct, a method that tests the extent to which a measure of phenomena correlates with other measures of the same phenomena (Hair et al. 2010). An alternate measured for innovation – one of the three dimensions of the EO construct used in this study is R&D intensity (Miller and Le Breton-Miller 2011). The correlation of
R&D intensity was tested in relation to the EO construct employed in this study. As expected, the correlation was positive and significant (0.16, p < 0.01) confirming the validity of the construct used in this study.

Hypotheses Tests

The hypotheses were tested using multiple regression analysis in three models. Model 1 tests the control variables; Model 2 tests the predictor variable; and Model 3 tests the full model including the moderation variable. The results are shown in Table 3.

**TABLE 3**

Hypotheses Tests Regression Results

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>H1</td>
<td>H2</td>
</tr>
<tr>
<td><strong>β</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year Dummy 2008</td>
<td>0.18</td>
<td>0.18</td>
<td>0.18</td>
</tr>
<tr>
<td>Year Dummy 2009</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Firm Age</td>
<td>-0.54***</td>
<td>-0.37**</td>
<td>-0.37**</td>
</tr>
<tr>
<td>Firm Age Squared</td>
<td>0.62***</td>
<td>0.55***</td>
<td>0.55***</td>
</tr>
<tr>
<td>Firm Size</td>
<td>-0.27***</td>
<td>-0.33***</td>
<td>-0.33***</td>
</tr>
<tr>
<td>(In # Employees)</td>
<td>0.29***</td>
<td>0.30***</td>
<td>0.30***</td>
</tr>
<tr>
<td>Environmental Dynamism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO Tenure</td>
<td>0.33**</td>
<td>0.33**</td>
<td></td>
</tr>
<tr>
<td>CEO Tenure Squared</td>
<td>-0.42***</td>
<td>-0.42***</td>
<td></td>
</tr>
<tr>
<td>Moderation Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family vs. Non-Family</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family/Non-Family x CEO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>-0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family/Non-Family x CEO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure Squared</td>
<td>0.12*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>R² / Adjusted R²</strong></td>
<td>0.27/0.26</td>
<td>0.28/0.27</td>
<td>0.28/0.27</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>38.04</td>
<td>29.60</td>
<td>22.27</td>
</tr>
</tbody>
</table>

* = p < 0.05; ** = p < 0.01; *** = p < 0.001
Standardized Coefficients
N=630; 210 companies 2007-2009
The results of Model 1 show that all the control variables are significantly related to EO. Firm age presented an unpredicted U-shaped curvilinear relationship to EO ($\beta = -0.54$, $p < 0.001$; $\beta$ of the squared term = 0.62, $p < 0.001$). Because multicollinearity can create problems with the statistical significance of individual coefficients, interpreting the results in non-linear relations can be difficult. Therefore, the curvilinear effect was tested by assessing the significance of the change in $R^2$ from the linear to curvilinear relationship (Hair et al. 2010). The change in $R^2$ (0.08) was significant ($p < 0.001$) and a curvilinear relationship confirmed. In addition, the signs of the coefficients ($\beta = -0.54$, $\beta$ of the squared term = 0.62) indicate a U-shaped relationship in which the sample firms are more entrepreneurially oriented during their earlier and later ages. The shape of the relationship is represented in Figure 2.

![Figure 2: Firm Age to EO Curvilinear Relationship](image)

Model 2 tests Hypothesis 1 (H1) which posits that CEO tenure is positively related to EO in an inverted-U shaped relationship. The findings for Model 2 shown in Table 3 confirm a positive inverted-U relationship ($\beta = 0.33$, $p < 0.01$; $\beta$ of squared term...
= -0.42, p < 0.001). Figure 3 demonstrates the inverted-U shaped relationship. H1 is supported.

Model 3 tests Hypothesis 2 (H2) that proposes that ownership type of family versus non-family will moderate the positive relationship between CEO tenure and EO. The results are significant and support H2. The comparisons of the shapes of the inverted-U relationships confirm the hypothesized condition as shown in Figure 4. The relationship of CEO tenure to EO is the same at the earliest point of the tenure. The CEO tenure-EO relationship in family firms increases at a greater rate than non-family firms until the middle stage of the tenure. The relation in family firms becomes more negative through the remainder of the CEO tenure. Therefore, H2 is supported in that a significant inverted-U relation is found and the shapes perform as hypothesized.

Because the family firm was broadly defined in this study, a supplemental analysis using a more stringent definition of family firm was performed following recent
suggestions by Miller, et al. (2007). The supplemental analysis was based on the definition of family and/or founder firm found in the Board Analyst – The Corporate Library database, a well-known subscription database that is widely used for corporate information. The database defines family firms as firms in which family members own more than 20% of the firm. Founder firms are defined as those having the founder as CEO or Chairman of the Board and holder of more than 10% of the total voting power. Based on the more stringent definition, 49 firms (147 observations) from the 210 firms (630 observations) were classified as family/founder firms. The results of the additional analysis presented similar significance levels (p < 0.05) and the β signs were in the same direction (β = -0.07, β of the squared term = 0.20). Based on the supplemental analysis, the original definition of family/founder firm is corroborated.

FIGURE 4
CEO Tenure to EO Relationship Moderated by Family vs. Non-Family

![CEO Tenure to EO Relationship Moderated by Family vs. Non-Family](image)
Robustness Tests

Different methods were used to test the robustness of this study. First, the control variables were removed and the main effect tested. The results show that the model held the positive and significant relationship ($\beta = 0.41, p < 0.001; \beta = -0.44, p < 0.001$).

Next, the model was tested for outlier influence by reducing the sample by one standard deviation from the maximum and one standard deviation from the minimum data points. The results do not demonstrably change in coefficient sign and significance from the full sample analysis and therefore the results indicate no outlier effect.

Endogeneity

Endogeneity – when the direction of causality may be inextricably confounded and the error term of one variable is correlated with another - may influence the model results. This condition has the potential to upwardly bias the coefficient estimates (Shaver 1998). Too often, it is hard to know if A is causing B - or the other way around. That uncertainty is an especially relevant problem in EO research: for example, it is just as sensible to believe that a firm that maintains a high level of EO might result in an extended tenure of the CEO because of the greater performance. The possibility of reverse causality was tested by switching the predictor and criterion variables (Landis and Dunlap 2000). CEO tenure was entered as the criterion variable and EO as the predictor variable. The results showed an insignificant relationship, indicating that CEO tenure should be modeled exogenously and that endogeneity does not appear to be influencing the original results.
DISCUSSION

Discussion of Findings and Implications

The findings of this study reinforce the importance of the CEO to the strategic posture of the firm and how that differs in family versus non-family firms. The results of this investigation contribute to the entrepreneurial orientation, top management and family firm literature in two unique ways. First, the findings present an inverted-U relationship between CEO tenure and EO. While there is a gap in the literature relating CEO tenure to EO, the curvilinear findings are consistent with other studies that have related CEO tenure to different criterion variables (Miller 1991; Hambrick and Fukutomi 1991). On the other hand, the results are somewhat counter to the study by Simsek (2007) who found that the CEO is important, but does not directly influence entrepreneurial actions. He found that the CEO acts through the top management team which is posited in that study to have the greatest influence on entrepreneurial initiatives.

The current research confirms the positive relationship of CEO tenure with EO and that the relationship varies across the tenure. The importance of the inverted-U finding is that it provides firms with an understanding of the consequences that early and late stage CEOs have on the firm’s entrepreneurial posture and points to when these effects may take place. As demonstrated in Figure 3, the peak of the relationship happens close to 12 years of tenure. The CEO’s influence with EO grows through the years from 1 to 12 in which he or she gains influence and knowledge sufficient to craft and execute more entrepreneurial strategies. The CEO’s relationship on EO then declines as he or she begins to avoid risky ventures and innovations that might jeopardize his or her position.
The increase and then decrease in the relationship of tenure with EO offers the board of directors information to structure compensation plans and incentives aimed at encouraging CEOs to maintain or enhance the firm’s entrepreneurial posture. In addition, it demonstrates that top executive turnover at certain levels of tenure is not always a negative event. The strong positive relationship of EO with performance found in previous studies (Rauch et al. 2009, Miller 2011) heightens the necessity of maintaining a high level of EO and therefore demands the attention of the board of directors and owners of the firm to the CEO’s tenure and its relationship with EO.

Second, the current study extends the CEO tenure, EO and family firm discussions by bringing them together in an effort to understand the differences in CEO tenure in family versus non-family firms and the influence that might have on EO. It was posited in Hypothesis 2 that the inverted-U relationship of CEO tenure to EO would be moderated by the ownership types of family and non-family such that the relationship would be more positive in the early stage and more negative in the later stage of tenure in family firms when compared with non-family firms (see Figure 4).

The results confirm the hypothesis and provide an interesting contrast between family and non-family CEOs and their connection with the firm. For instance, it was proposed that CEOs would initially have less power and knowledge to identify and have a strong influence in pursuing more risky and innovative opportunities in the early stages of their tenure. Based on the comparison of the graphical presentation of the results, shown in Figure 4, both family and non-family CEOs’ influence on EO is similar at the very beginning. However, the level of EO in family firms increasing more rapidly than non-family firms in the early stages of the CEO’s tenure. Supporting the argument
earlier that power and influence increases more rapidly in family firms in the early stage of tenure. A possible explanation is that in a family firm, members that take over as CEO may be more familiar with the firm and have an established power base from which to pursue entrepreneurial initiatives that CEOs in non-family firms might not enjoy. An implication for management in non-family firms is the consideration of hiring CEOs from within the firm or someone closely related to the firm in a manner similar to family firms in an effort to capture the accelerated increase in EO in the early tenure of the CEO.

As the graphs in Figure 4 also show, the relationship of CEO tenure and EO are more negative in the later stages of the tenure confirming that, as hypothesized, CEOs in family firms become less entrepreneurial in the later stages of their tenure when compared to non-family firm CEOs. One reason might be the felt need to protect the family wealth. Similar reactions to protect wealth might be taken by non-family firm CEOs when ownership options are granted earlier in the tenure. The findings give credence to the evaluation of granting ownership options later in the CEO tenure in an effort to incent CEOs to continue to build value rather than only protecting it.

Limitations and Directions for Future Research

This study is not without limitations. First, the study is limited by the choice of the sample used. Five industries represented by a wide range of dynamic environments were chosen because previous research has shown that EO is higher in dynamic environments. The sample includes sample companies within low and highly dynamic environments providing a contrast and variability. However, the narrow range of industries included may limit the generalizability of the findings. In addition the sample
is U.S.-centric and other geographic contexts may alter the relationships considered in the current study. Future researchers are encouraged to test the findings across a wider range of samples from a wider range of industries and other contexts, such as across countries.

Second, the determination of family firm status is difficult and the definition of family firm status is inconsistent in the family research (Anderson and Reeb 2003). An effort was made to determine family status based on ownership percentages, board membership and information from subscription databases. However, all family firms may not have been identified. In addition the family firms included a number of founder firms – firms in which the founder was still CEO or Chairman of the Board. Previous research has shown that founder firms are more entrepreneurial when compared to other family firms (Miller 2007). While this limitation may bias the findings, the limited samples prevented separating the types of family firms. Future research should consider the generation of the family firm to determine any differences between founder, second and other generation firms.

Third, the use of content analysis may be viewed as a less desirable method of variable construct for determination of EO. Even so, the CATA measurement technique is a valuable method within the management and entrepreneurship fields because it allows researchers to determine executive attitudes, beliefs and decision-making in an unobtrusive manner. The construct validity was tested in the current study using acceptable steps resulting in confidence in the measure of EO. Future research may consider alternative methods for measuring the EO construct.
Lastly, the panel data includes three years of data from 2007 – 2009. There are two potential limitations related to this time span. First, the limit of three years does not provide an extended time to evaluate potential changes in conditions and related results. Future research should consider extending the number of years to evaluate lag effects. Second, national economic conditions deteriorated during this time span which resulted in the United States being in a recessionary period. While this adds an interesting dynamic to the study, it also does not allow for a sufficiently controlled environment in which to test lag effects. Future research should evaluate the relationship of CEO tenure to EO during stable conditions, as well as comparing findings prior to and following significant economic changes.

Conclusion

One of the two primary purposes of this study was to understand an important component of how a CEO matters in the setting of the entrepreneurial orientation of the firm. The findings indicate that the tenure of the CEO is related to EO in a curvilinear manner. The results provide support to the leader life cycle described by Hambrick and Fukutomi (1991) and Miller (1991) in which CEOs have less influence in the early stages of their tenure, more in the middle and declining influence toward the end.

The second purpose of the study was to identify and provide new understanding of the difference in the CEO tenure-EO relationship in the ownership types of family versus non-family. The findings add to the support that family firms are more entrepreneurial than non-family firms. It also confirms that CEOs in family firms act
differently across their tenure in consideration of innovativeness, risk-taking and proactiveness.

In summary, the current study is an important advancement in the understanding of the roles CEOs play in how family and non-family firms foster and sustain an entrepreneurial orientation – an essential consideration for scholars and practitioners in a time when entrepreneurship is promoted and celebrated as a growth engine for the economy.
REFERENCES


Journal of Marketing Theory and Practice. 8(2): 63-78.

Management Science. 29(7): 770-791.


