The impacts of founding teams' characteristics, types of opportunities, and types of strategies on firm performance in new business ventures

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THE IMPACTS OF FOUNDING TEAMS' CHARACTERISTICS,
TYPES OF OPPORTUNITIES, AND TYPES OF
STRATEGIES ON FIRM PERFORMANCE
IN NEW BUSINESS VENTURES

by

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A Dissertation Presented in Partial Fulfillment
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ABSTRACT

In this dissertation, I examine the impact of the characteristics of founding team on firm performance in new business ventures. In addition, this study investigates the moderating effects of the types of opportunities and the types of strategies on the relationships between founding teams' knowledge and firm performance. Although considerable research has examined the effects of founding teams' education and experience on firm performance, findings are inconclusive and disintegrated. Few studies have attempted to investigate the combined effects of these important factors on new ventures' performance and survival. As a result, this study investigates the impact of founding team knowledge acquired through formal education, industry experience, and entrepreneurial experience on firm performance, while considering the moderating effects of different types of opportunities and types of strategies.

New ventures often lack resources, track-records, and reputation. Therefore, entrepreneurial founding teams' knowledge is a critical for survival and growth of new ventures. Human capital includes knowledge, skills, and experience. The knowledge-based view (KBV) explains how an individual’s knowledge can be a source of competitive advantage and influence new ventures’ growth and survival. Cognition theory explains how individuals’ cognitive profile determines how they handle complex information in order to identify and exploit opportunities. An individual’s cognitive profile can be shaped by experience.
This study reviews and examines the effects of three dimensions of founding teams’ knowledge, such as breadth (founding teams’ education, industry experience, and entrepreneurship experience), depth (founding teams’ education, industry experience, and entrepreneurship experience), and relatedness (founding teams’ education and industry experience) and on firm performance in new ventures. This research, in addition, investigates the moderating effects of the types of opportunities (novelty-centered opportunities and efficiency-centered opportunities) and the types of strategies (differentiation strategies and low-cost leadership strategies) on the relationship between founding teams’ knowledge and firm performance.

I used archival data from Hoovers online, Edgar, and S&P Compustat to test the effects of founding teams’ knowledge and experience on firm performance. I also tested the moderating effects of the types of opportunities and the types of strategies on the relationships between founding teams’ knowledge and firm performance. Empirical results provide some support for the hypotheses. The types of opportunities and the types of strategies somewhat moderate the relationship between founding teams’ knowledge and firm performance in young firms. The results also provide support for the three-way interaction effect of founding teams’ knowledge, the types of opportunities, and the types of strategies on firm performance.

This study contributes to the entrepreneurship literature examining the effects of specific dimensions of founding teams’ knowledge and experience on firm performance. Specifically, it provides new insight into the interaction effects of the types of opportunities and founding teams’ knowledge on performance, highlights moderating effects of types of strategies on the relationships between founding teams’ knowledge and
performance, and sheds light on the interaction effects of types of opportunities, types of strategies, and founding teams' knowledge on performance. The important implication for organization and management is that founding teams' knowledge and experience and the types of opportunities and the types of strategies should be matched. This research suggests that future research should use different data collection methods to obtain data before IPO to examine these relationships in question at the early stage of new ventures. In addition, future research should examine other types of opportunities and strategies.
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CHAPTER ONE

INTRODUCTION

Entrepreneurship is a key driver of economic growth (Christensen & Bower, 1996). Entrepreneurship researchers have been interested in the determinants of new businesses’ survival and success. A line of research has focused on the founder’s characteristics as the key factors for new ventures’ success. Entrepreneurs play an important role in establishing and growing new ventures as they provide vital tangible and intangible resources, such as financial, social and human capital (Bloodgood, Sprienza, & Almeida, 1996; Kor & Mahoney, 2000). A group of entrepreneurs who jointly found a new venture is referred to as a founding team. Founding teams can add to the diversity of views and skills, and can enable the completion of complex tasks. Thus, a large proportion of new ventures are founded by an entrepreneurial team rather than an individual entrepreneur, and a founding team is more effective than an entrepreneur for success (Kamm & Shuman, 1990; Roure & Madique, 1986; Westhead, 1995).

A large body of literature on new ventures has been developed for several reasons. First, new ventures are different from established firms. While established firms have already achieved a level of viability and survival, new ventures are subject to liability of newness, which leads to their low rate of survival (Buederal, Preisendoerfer, & Ziegler, 1992). Specifically, Carroll (1983) argues that new business ventures have a low survival rate because they are often small and lack legitimacy. Freeman, Carroll, and
Hannan (1983) indicate that as the size and age of the new ventures increase, the adverse impact of the liability of newness weakens.

Second, growth rates and factors that determine the rates are different between new business ventures and established firms. New business ventures are likely to have higher growth rates than do established firms. Economics literature argues that for large and established firms, firm size and tangible resources drive growth rates (Sutton, 1997). Such a relationship has not been found to hold systematically for new business ventures (Gilbert, MacDougall, & Audretsch, 2006). Given these differences between new ventures and established firms, it is important to examine factors that determine new business ventures’ growth and performance, which has been relatively under-researched compared to those of established firms.

Unlike large established firms, the growth and survival of new business ventures are critically dependent on their founders’ or founding teams’ human capital. Founders’ human capital represents the most important source of competitive advantage for new ventures (Hatch & Dyer, 2004). Bartel and Lichtenberg (1990), Link and Siegel (2007), Siegel (1999), and Siegel, Waldman, and Youngdahl (1997) have provided evidence that founders with more human capital, such as more education and experience, can contribute to the growth of their firms more effectively. An entrepreneurial founding team provides greater human capital than do individual entrepreneurs. Previous studies have indicated that high-growth new business ventures are typically launched by founding teams (Shrader & Siegel, 2007). Thus, this study focuses on founding teams rather than individual founders.
Human capital includes knowledge, skills, and experience. In general, entrepreneurship studies often focus on founding teams' characteristics, such as age, gender, education, managerial experience, functional background, organizational and industrial tenure, joint work experience, industry experience, and entrepreneurial experience. Such characteristics can be categorized into three dimensions: demographic characteristics, experiential characteristics, and psychological characteristics (Sapienza & Grimm, 1997). This research examines founding teams' demographic and experiential characteristics. Specifically, this study focuses on founding teams' education for demographic characteristics and industry experience and entrepreneurial experience for experiential characteristics. With limited financial and cumulated organizational resources, founding teams' knowledge is the most critical resource in new business ventures.

Cognition theory (Fiske & Taylor, 1991) explains how individuals' cognitive profile determines how they identify and exploit opportunities (Ucbasran, Westhead, & Wright, 2009). An individual's cognitive profile can be shaped by education and experience. According to expert cognition literature, prior education and experience may improve performance. However, beyond a certain experience threshold, biases in thinking may interfere with the behavior and performance of an individual (Baron & Henry, 2006). The knowledge-based view (KBV) explains how an individual's knowledge can be a source of competitive advantage and influence new business ventures' growth and survival.

Three aspects are distinguished in the KBV: the breadth of knowledge, the depth of knowledge, and the relatedness of knowledge. In this dissertation, three aspects of
founding teams' knowledge are specified into eight characteristics: the breadth of founding teams' education, the breadth of founding teams' industry experience, the breadth of founding teams' entrepreneurial experience, the depth of founding teams' education, the depth of founding teams' industry experience, the depth of founding teams' entrepreneurial experience, the relatedness of founding teams' education, and the relatedness of founding teams' industry experience. Finally, this study examines the impact of these characteristics on new business ventures' performance.

One of the most important abilities of successful entrepreneurs is to identify opportunities (Ardichvili, Cardozo, & Ray, 2003) and consequently, such abilities have become an important element of entrepreneurship literature. Prior researches argue that organizations need to continuously identify new opportunities beyond existing competencies if they are to survive and grow (Hamel & Prahalad, 1989; McGrath, Tsai, Venkataraman, & MacMillan, 1996). The resource-based view has extended its boundaries to include the ability to identify opportunities as a resource that can lead to a competitive advantage (Alvarez & Busenitz, 2001). Scholars have suggested that opportunity identification is likely to be related to prior knowledge (Shane, 2000), social networks (Singh, Hills, Hybels, & Lumpkin, 1999), entrepreneurial cognition (Baron, 1998), and potential financial reward (Schumpeter, 1976).

Opportunity identification involves individuals' creativity. Therefore, the creation of a successful business is a result of an opportunity development process. This implies that the opportunity identification process is cyclical and repetitive: entrepreneurs continuously monitor and assess their environment and their firms in order to identify new opportunities or adjust their initial visions and strategies.
Entrepreneurship literature indicates various types of opportunity classifications (e.g., Corbett, 2005; Dew, Velamuri, & Venkataraman, 2004; Eckhardt & Shane, 2003; Gartner, 1985; Zott & Amit (2008). This study uses the classification in which opportunities are divided into novelty-centered and efficiency-centered. Prior research has often examined the direct relationship between types of opportunities and new business ventures’ performance (Tihanyi, Johnson, Hoskinsson, & Hitt, 2003). As certain types of founding teams’ knowledge may be relevant to exploit certain types of opportunities, this study attempts to examine how various combinations of founding teams’ knowledge and experience and types of opportunities affect new business ventures’ performance.

According to the upper echelons perspective (Hambrick & Mason, 1984), top management perceptions and cognitive bases are able to influence strategic choice and new business ventures’ performance. The upper echelons perspective suggests that the demographic characteristics of managers act as proxies of their cognitive bases and values which are expected to influence strategy and new business ventures’ performance. Implementing business strategies is concerned with the fit between the ventures’ business strategies and their internal processes (Galbraith & Kazanjian, 1986). This encourages an investigation of the impact of founding teams’ characteristics and business strategies on firm performance. Business strategy deals with how businesses achieve competitive advantage. Porter’s (1980) typology is the dominant framework for identifying business strategies. Based on Porter’s typology, this study uses two types of strategies, differentiation and low cost leadership, to examine the interaction effects between founding teams’ characteristics and strategies on new ventures’ performance.
Statement of Problem and Research Objectives

This study investigates the impact of founding teams’ characteristics on firm performance considering the moderating effects of types of opportunities and types of strategies in new business ventures. Figure 1.1 describes the study’s research model. The specific purposes of this study are as follows:

1. To summarize the prior studies of the effects of founding teams’ characteristics on firm performance in new business ventures.

To identify and specify different dimensions of founding teams’ knowledge and experience: breadth, depth, and relatedness.

2. To contribute to the research on the importance of the characteristics of founding teams’ knowledge and their impact on firm performance in new ventures.

3. To examine the critical impact of founding teams’ characteristics on firm performance.

4. To investigate the moderating effects of different types of opportunities on the relationship between founding teams’ characteristics and firm performance.

5. To examine the moderating effects of different types of strategies on the relationship between characteristics of the founding team and firm performance.

6. To investigate the fit among the characteristics of founding teams and types of opportunities and types of strategies.

7. To provide an integrated model examining the impact of founding teams’ characteristics, types of opportunities, and types of strategies on firm performance in new business ventures.
Contributions of the Study

This dissertation will further the understanding of founding teams' characteristics in new business ventures in several ways. First, using cognition theory, human capital theory, and the knowledge-based view, this dissertation offers insights into the impact of founding teams' knowledge breadth, knowledge depth, and knowledge relatedness on new business ventures' performance. Second, this study examines the moderating effects of opportunities on the relationship between founding teams' knowledge and experience and firm performance. Previous studies have examined the relationship between business opportunities and new ventures' performance, but few have examined the combined effect of founding teams' knowledge and opportunities on new ventures' performance. Third, this dissertation introduces different types of strategies as the moderating effects
on the relationship between founding teams' characteristics and new ventures' performance. Finally, this dissertation examines the combined impact of founding teams' knowledge and experience, different types of opportunities, and different types of strategies on new ventures' performance.

**Plan of Study**

The remainder of the dissertation will be organized as follows. Chapter Two provides a review of relevant literature that leads to the development of the hypotheses. The review includes entrepreneurship, new business ventures, the characteristics of founding teams, types of opportunities, types of strategies, and different measures of firm performance, as well as the theoretical background, including cognition theory, human capital theory, and the knowledge-based view. Chapter Three describes the proposed statistical methods and procedures to be used for the empirical analysis. Chapter Four will present the findings of the empirical study. Finally, Chapter Five will discuss the practical implications of the findings, the limitations the study, and the suggestions for future research.
CHAPTER TWO

LITERATURE REVIEW

Entrepreneurship

Entrepreneurship is a topic of great interest to academics and practitioners (McDougall & Oviatt, 2000). However, the definition of entrepreneurship is elusive because the domain of entrepreneurship overlaps with the domains of other constructs such as innovation and change management. This dissertation starts with making a clear distinction concerning entrepreneurship and entrepreneurs.

Following the review of entrepreneurship literature, a review of the new business venture literature is provided. Specifically, the roles of entrepreneurship in new ventures are highlighted in the review. The roles of entrepreneurs in new ventures are presented, and then the comparison between entrepreneurs and entrepreneurial founding teams is conducted. Furthermore, founding teams’ characteristics provided in previous empirical literature on entrepreneurial founders and founding teams are reviewed. Prior findings about business opportunities and strategies and related theories such as cognition theory, human capital and insights of entrepreneurship literature, and the knowledge-based view, are summarized. Finally, hypotheses and the research model are introduced in the last section of this chapter.
**What is Entrepreneurship and Who are Entrepreneurs?**

Entrepreneurship is described as the process of creative destruction, in which entrepreneurs continually replace or destroy existing products or methods of production with new ones (Schumpeter, 1936, 1950). Scholars have offered the construct of entrepreneurship (e.g., Gartner, 1990; Nelson, 2003; Schumpeter, 1936).

The earliest study on entrepreneurship has been traced to Richard Cantillon's work (1734). In the early stage, entrepreneurship was viewed as self-employment with an uncertain return (McMullan & Long, 1990). In the early twentieth century, an entrepreneur was referred to as a person who is creative and innovative in building something of recognized value around perceived opportunities.

Bull and Willard (1993) categorized the existing literature into five broad categories. The first category focuses on defining the word “entrepreneur” (Shane & Venkataraman, 2000). The second category considers the psychological traits of people identified as entrepreneurs (Baum & Lock, 2004; Foo, Uy, & Baron, 2009; Ucbasaran, Westhead, & Wright, 2009). The third category covers success strategy and seeks to explain the success of new and existing business ventures (Baron & Tang, 2011; Boyd, 1990). The fourth category investigates the formation of new ventures (Virtanen, 1997). The last category concentrates on the effect of environmental factors on entrepreneurial actions (Becherer & Maurer, 1997; McMullen & Shepherd, 2006).

Entrepreneurship researchers argue that the initial definition of “entrepreneur” is insufficient to describe entrepreneurs’ roles. More recently, Gartner (1990) identified two distinct meanings of entrepreneurship to fill the gap. The first scholars focus on the
characteristics of entrepreneurship, such as innovation, growth, and uniqueness, while the second focuses on the outcomes of entrepreneurship, such as the creation of value.

In general, entrepreneurship is characterized by some type of innovation, a significant investment, and a strategy that values expansion. The entrepreneur is different in terms of mindset from a manager in a new business venture. The development of new business ventures is shaped by the ability of an entrepreneur to efficiently utilize accumulated tangible and intangible resources (Bloodgood, Sapienza, & Almeida, 1996).

Furthermore, scholars have offered sources of entrepreneurship: personality and demographic markers (Aldrich, 1990; Carsrud & Johnson, 1989; Hisrich & Brush, 1986; Johnson, 1990; McClelland, 1976). In these studies, personality includes high ambition, drive, tolerance for uncertainty, and risk orientation. Demographics are associated with gender, age, education, and so on.

**Entrepreneurship in New Business Ventures**

Entrepreneurship is a dynamic process created and managed by an individual to exploit economic innovation and create new value in the market (Gartner, 1988). An entrepreneur is a person who has an entrepreneurial mind with a strong need for achievement (Murray, 1983). Gartner (1988) argued that the roles of an entrepreneur are the primary phenomenon of entrepreneurship: the creation of organizations and the process by which new organizations come into existence.

The dominant entrepreneurship theories have explained entrepreneurship as a function of the type of people engaged in entrepreneurial activity in new ventures (Eckhardt & Shane, 2003). Researchers have taken a person-centered perspective, in which entrepreneurship depends on stable, enduring differences among people rather than
differences in the information they possess about the presence of opportunities (Khilstrom & Laffont, 1979).

Entrepreneurs often work in small niche markets to create new business opportunities. Entrepreneurs need money to survive, but they seem to have a passion for doing things differently from non-entrepreneurs. They think creatively. Entrepreneurs take on risks. They tend to take challenges and the risk of a new business venture is the perfect challenge. Entrepreneurs establish their own businesses based on their passion for their dreams and visions. They often find new business ideas by trying to solve old problems in new ways.

**Dimensions of Entrepreneurship**

Lumpkin and Dess (1996) highlight a variety of entrepreneurial orientation dimensions. In their argument, the dimensions of entrepreneurship orientation consist of autonomy, innovativeness, novelty, risk taking, proactiveness, and competitive aggressiveness. Autonomy refers to the independent action of an individual or team in bringing an idea or a vision and carrying it through to completion. Innovativeness is defined as a firm's tendency to engage in and support new ideas. Novelty, experimentation, and the creative process refer to a firm's activities to produce new products, services, or technological processes. Risk taking is the degree to which managers are willing to make large and risky resource commitments. Proactiveness acts in expectation of future problems, needs, or changes. Finally, competitive aggressiveness is associated with the firm's propensity to directly and intensely challenge its competitors to achieve entry or improve position.
Other scholars view entrepreneurship as focusing on opportunities that may be bought and sold, or they may form the foundation of new business ventures. Shane and Venkataraman (2000), for example, suggested three areas focusing on the identification of opportunities, who, when, and by whom they are discovered, and how these opportunities are exploited. They argued that entrepreneurship has two parts: opportunities and individuals who endeavor to take advantage of them. Furthermore, Zahra and Dess (2001) highlight the outcomes of exploiting entrepreneurial opportunities as the fourth dimension of Shane and Venkataraman's dimensions.

**Entrepreneurship and Business Opportunities**

A business opportunity regards as the idea that an economic system never reaches its full potential and there is always room for actions that can take it closer to that potential. Entrepreneurs create opportunities (Alvarez & Barney, 2007). An opportunity represents a stream of continuously developed and modified ideas (Davidsson, 2003; Dimov, 2007). An opportunity cannot be separated from the entrepreneur (Companys & McMullen, 2007; Sarason, Dean & Dillard, 2006; Dimov, 2007). Finally, an opportunity is intertwined with individual beliefs (McMullen & Shepherd, 2006; Shepherd, McMullen, & Jennings, 2007) and exists only in the individual's imagination (Klein, 2008).

Entrepreneurial initiative leads to exploitation and of some opportunities, and the true entrepreneur is intuitive and elegant. Entrepreneurial success anticipates conditions of opportunity and such opportunities appear to have been accessible to certain entrepreneurs (Dimov, 2010). Researchers of entrepreneurship have studied the developing and exploiting of opportunities and systematically examined the nature of
opportunity recognition. Zahra and Dess (2001) argue the importance of the development of human capital and the enhancement of intellectual capital as an entrepreneurial research area and explore the impact of business opportunity identification by human capital on the success and failure of new business ventures. Grenadier and Weiss (1997) found that entrepreneurs who develop knowledge and skills that can be readily redeveloped in other ventures can more safely enter into new markets, products, or technologies.

Entrepreneurship involves taking certain business risks, innovation, and creativity. An entrepreneur is a person who takes on the risk of starting a new business or creating a new product. Entrepreneurial efforts lead to the formation of new ventures and growth of the firms through opportunity identification. According to Kogut and Zander (1992), many of the intangible resources associated with new business ventures may lend themselves readily to new resource combination, lessening the risk of irreversible commitments.

**Characteristics of New Business Ventures**

Aldrich, Kalleberg, Marsden, and Cassell (1989) identify three possibilities in defining a new business ventures: an enterprise formed when all the elements of the business are assembled for the first time into one coherent entity, a takeover by a new owner, and any changes in the legal form of a business. Thus, new business ventures are commonly characterized by (1) small and young firms, (2) less legitimacy and governance, and (3) a critical role for the entrepreneurial founder and founding team in decision making.
Small and Young Firms

Certo et al. (2001) argue that new business ventures tend to be small, young firms. The U.S. Small Business Administration (SBA) suggests that a small business is one that is independently owned and operated, and is not a dominant firm in its field of operation. The small business literature argues that small, young firms often struggle with their relative newness and smallness. Unlike established firms, which have already achieved a level of viability and sustainability, new ventures are subject to a liability of newness where their survival may be significantly reduced (Buederal, Preisendoerfer, & Ziegler, 1992). Empirical studies have provided evidence of the liabilities of newness and smallness (Stinchcombe, 1965). This notion indicates that younger firms have a higher incidence of failure than established firms because they are in the learning process of developing internal structures and capabilities, and they are struggling to establish external relationships needed to survive and grow (Zahra & Filatotchev, 2004).

Less Legitimacy and Weak Corporate Governance

As Burton et al. (2004) discussed, small, young firms do not have a need for corporate governance, especially where the firms have no outside investors or major outside stakeholders. The ownership of new business venture is likely to be concentrated in the hands of entrepreneurial founders or the founding team and a few private investors.

Legitimacy is the level of social acceptability conferred upon a set of activities (Dowling & Pfeffer, 1975). Zahra and Filatotchev (2004) contend that small, young firms lack legitimacy. Small firms tend to have lower levels of organizational knowledge and legitimacy, relative to large organizations.
New ventures are initially funded with their founders’ equity, and from borrowing. As new ventures grow, they require more capital. Entrepreneurs typically prefer to finance capital needs from internally generated funds rather than through external investors (Barton & Gordon, 1987). In general, capital needs exceed internal sources, and entrepreneurs have to invite equity investments from venture capitalists. Ownership of new business ventures is often concentrated in the hands of entrepreneurs and large private investors (Prasad et al., 1995).

Firm founders often lack the cognitive capacity to undertake all firm organizing actions simultaneously (Gifford, 1992; Simon, 1976). Firm founders will vary as to whether they first engage in actions that generate legitimacy, develop social ties with stakeholders, or recombine resources. As a result, formal corporate governance mechanisms such as boards of directors are either nonexistent, or are established for other purposes such as obtaining advice, resources, and legitimacy rather than monitoring (Welbourne & Andrews, 1996).

**Critical Role of Entrepreneurial Founder in Decision Making**

For new ventures, resources in general are comparatively scarcer, and decisions about acquisition and allocation of resources can be critical to survival (Cooper & Dunkelberg, 1986). In smaller and newer ventures, managerial interaction is less formalized and there are generally fewer slack resources available (Hambrick & Crozier, 1985). Therefore, the potential for individual characteristics of entrepreneurial founders to influence firm behavior is especially great in new ventures (Forbes, 2005).
The insight of entrepreneurship literature can provide evidence of the entrepreneurial founders’ impacts in new business ventures. Entrepreneurial founders are likely to have more power to affect organizational outcomes than managers at large firms for many reasons: (1) they often have large ownership positions in their firms (Prasad et al., 1995), (2) they have greater psychological attachment to the firm (Westphal, 1998), (3) they possess critical firm-specific knowledge and competencies (Alvarez & Busenitz, 2001; Baum et al., 2001), (4) they are normally the locus of decision making (Begley & Boyd, 1987), and (5) they are less constrained by organizational systems and structures (Certo et al., 2001).

**Entrepreneurial Founders’ and Founding Teams’ Characteristics**

The fundamental activity of entrepreneurship is new venture creation (Gartner, 1985, 1990). After that, entrepreneurial new ventures are risk-taking, innovative, and proactive. The position of a firm on this continuum is referred to as its entrepreneurial intensity.

Research on founder-led firms has generally argued that the decision-making processes, investment choices, governance structure, ownership structure, firm behavior, and consequently performance of founder-led firms differs from that of non-founder-led firms (Jayaraman et al., 2000; Nelson, 2003). The decisions entrepreneurs make in the venture’s early years have profound long-lasting implications for performance (Bamford, Dean, & Douglas, 2004; Boeker, 1989; Eisenhardt & Schoonhoven, 1990; Park & Bae, 2004; Stinchcombe, 1965). Specifically, information processing by entrepreneurs has been associated with problem solving and decision making (Simon, 1991), innovation
Within the study of entrepreneurship, various approaches have been selected to describe entrepreneurs (Cunningham & Lischeron, 1991) by focusing on their personalities, backgrounds, and prior experiences (Carland, Hoy, Boulton, & Carland, 1984). In addition, researchers have focused on the behavioral aspects of entrepreneurs (Chell, Haworth, & Brearley, 1991; Gartner, Bird, & Starr, 1992; Lumpkin & Dess, 1996).

Prior research has provided various factors that influence decision making, innovation, opportunity recognition, and so forth. Thus, this section mainly focuses on the characteristics of entrepreneurial founders and founding teams, such as demographic factors, heterogeneity, and prior experiences.

**Entrepreneurial Founders and Founding Teams**

There are differences and similarities between entrepreneurial founders and founding teams. Prior research has provided evidence of the influence of entrepreneurial founders' and founding teams' characteristics on firm performance, including demographic factors, functional background, educational background, start-up experiences, and so on. The demographic argument suggests that founding teams should have a positive influence on the outcome of the firm.

Roure and Keeley (1990) argue that team completeness is associated with success. They also suggest that the more successful new ventures are the more likely they are to have founding team members who have relevant experience managing high-growth
firms. Other scholars also report that the quality of the team’s past experience benefits the firm (Chandler, 1996; Jones-Evans, 1996).

**Entrepreneurial Founders**

Founders are those individuals involved in the founding process of the firm. Founders engage in a set of expected behavior patterns that are attributed to occupying a given position in a social unit (Robbins, 2000). Nelson (2003) argues that the founders (1) organize and take initiative in the organizational founding process, (2) are likely to work on important organizing tasks, (3) take the initiation step, particularly important because it is likely to establish ownership of the process, define its scale and scope, and imprint an organizational pattern, (4) make efforts that likely persist over time and contribute to completion of the founding event, (5) an organization may have one or more founder, and (6) for a founder to be declared, a company must become operational.

After the completion of founding work, entrepreneurial founders are likely to remain in the firms they found and serve as members of the top management team. On the other hand, new ventures enlarge the size of the management teams because the firms need to seek information to grow and survive. As a result, entrepreneurial founders are likely to the members of the top management team, but they differ substantially in their ability to exploit emerging business opportunities and deal with environmental constraints (Aldrich, 1999; Eisenhardt & Schoonhoven, 1990).

Researchers have accumulated knowledge of the impact of the top management teams in new business ventures. Upper echelons theory (Hambrick & Mason, 1984) generates a set of propositions linking the age, background, and tenure of top management teams to a set of organizational outcomes, including the choice of strategy.
and the ability of the group to function effectively over time. A large number of studies on top management teams’ demographics have shown the positive impact of both functional expertise and functional heterogeneity on the firm’s performance (Williams & O’Reilly, 1998).

Williamson (2000) suggests that new venture founders seek advice from those nearest to them and search for successful models to learn from. Williamson and Cable (2003) lend empirical support to the proposition that founders tend to select TMT members from sources with whom they share network ties, and that TMT hiring patterns appear to be shaped by mimetic isomorphism.

*Entrepreneurial Founding Team*

Cooper (1986) found the median number of firms started by more than one founder to be about 70 percent. Hartman (1986) found over two-thirds to have been started as a partnership. Prior research argues that proportion of start-ups begun by teams of two or more full-time founders (Cooper, 1970; Litvak & Maule, 1982; Shapero, 1972; Susbauer, 1969). Cooper and Bruno (1977) suggest that groups of founders are involved in about 83 percent of surviving high-growth firms.

Eisenhardt and Schoonhoven (1990) insist that more founders mean that there are more people available to do the enormous job of starting a new firm and that there is more opportunity for specialization in decision making. Teams help reduce cycle time in new product development (Ancona & Caldwell, 1992), increase the likelihood of innovation (Eisenhardt & Tabrizi, 1995), and improve product and service quality (Lawler, Mohrman, & Ledford, 1995). Entrepreneurial teams help attain first-mover advantages, forming strategic alliances, and/or developing discontinuous innovations
Entrepreneurial teams also allow firms faster decision to enter markets and to maintain responsiveness to changing market conditions.

Founding teams are particularly crucial in the context of technological entrepreneurship because investment decisions are based on the quality of the founding team (Gupta & Sapienza, 1992). Such founding members are the repositories of much of the technical and management knowledge, skills, and ability that make up the intangible assets of the firm (Cooper & Daily, 1997). Likewise, the size of the founding team has been positively related to a new business venture’s sales growth (Eisenhardt & Schoonhoven, 1990; Feeser & Willard, 1990).

Founding teams tend to differ in their ability to exploit or enhance resource levels (Eisenhardt & Schoonhoven, 1990). Eisenhardt and Bourgeois (1988, 1989) suggest that successful executive teams combined high conflict between team members with fast decisions. Conflict is crucial for team members to avoid complacency and mistakes that might drain resources. Therefore, fast and conflictual founding teams seem better able to make sparing use of resources and exploit opportunities (Bourgeois & Eisenhardt, 1988).

As a result, founding teams permit individuals to bring their own particular expertise to the start-up, whether it is technology, finance, or management. In addition, the pooling of capital, sharing of personal risks, and the psychological support of knowing may enhance the prospects for subsequent high performance. Teach et al. (1986) found that successful high-tech firms are more likely to have been started by larger teams.
Characteristics of Entrepreneurial Founding Teams

Hambrick and Mason’s (1984) upper echelons theory suggests that top managers have a great impact on the decisions made in firms and ultimately on the outcomes achieved by firms. They state that the characteristics of TMT members are determinants of strategic choices and, through these choices, of organizational performance.

There is a long-standing stream of research suggesting that organizational founders exert a powerful and lasting influence on the firms that they create (Boeker, 1988; DiMaggio, 1991; Eisenhardt & Schoonhoven, 1990; Schein, 1983). The relationship between founder characteristics and firm growth or survival is important for various reasons: (1) it is widely believed that the founders of a new venture place a lasting stamp on their companies that influence the cultures and behaviors of their firms (Mullins, 1996), (2) stakeholders (investors and others) often assess the potential of a new business venture by evaluating the attributes of its founders, and (3) founding a new business venture is a risk-taking and challenging process. Thus, individually different characteristics, such as entrepreneur’s educational area and level achieved and prior industry experience, have been found to be critical in launching a new business venture. In the following, a brief review of the research on the most widely studied founder characteristics is presented.

Scholars have examined the impacts of entrepreneurs’ characteristics on firm performance. Demographics, experience, and psychological background have all been studied (Sapienza & Grimm, 1997). Eisenhardt and Schoonhoven (1990), for example, investigated the characteristics of the founding top management team of technology-based ventures as related to the sales growth of the new ventures. The researchers argue
that new business ventures are inherently unique and differ from established firms. They finally suggest that young firms have a higher propensity to fail and their liabilities of newness present unique challenges to the new ventures top management team.

As shown, researchers have investigated the impact of founders’ characteristics on the firm’s outcomes, considering demographics, experience, and psychological background. Of the three dimensions, this study mainly focuses on the founding teams’ demographics and experience.

Demographic Characteristics

Demographic characteristics serve as proxies for the beliefs, values, and cognitions of managers (Hambrick & Mason, 1984). Prior research has provided evidence of demographic characteristics, such as average age (Amason, Shrader, & Tompson, 2006; Barker & Mueller, 2002; Bharat & Filiz, 2008; Ucbasran et al., 2003), age heterogeneity (Bantel & Jackson, 1989), and education (Amason, Shrader, & Tompson, 2006; Barker & Mueller, 2002; Hambrick, Cho, & Chen, 1996).

Age of Founder and Founding Team

Hambrick and Mason (1984) argue that younger managers may have less of a commitment to the status quo and therefore may be more willing to undertake novel and unprecedented strategies. Older managers may be risk averse (Carlsson & Karlsson, 1970; Vroom & Pahl, 1971), whereas younger managers may be more willing to pursue risky strategies (Hitt & Tyler, 1991).

Heterogeneity provides broader perspective, experience, knowledge, and insight in decision-making. Thus, different age cohorts experience different social, political, and
economic environments and events, which have a fundamental role in shaping attitudes and values. In addition, perspectives change as a function of the developmental process of aging (Elder, 1975). Assuming that diversity of attitudes and values facilitates group creativity, founding teams consisted of members of diverse ages should be more innovative. On the other hand, differences in attitudes and values may result in conflicts that hamper the development of team cohesiveness (Pfeffer, 1983).

Prior research has found various evidences on the relationship between founding age and performance. Bharat and Filiz (2008) argue that the probability of the founder CEO at IPO is negatively related to the age of the founder. Barker and Mueller (2002) suggest that a CEO’s age is negatively associated with a firm’s R&D spending. Amason, Shrader, and Tompson (2006) argue that the heterogeneity of the age of the top management team is negatively related to performance in a high novelty venture. The firms most likely to undergo changes in corporate strategy had top management teams characterized by a lower average age (Wieserma & Bantel, 1992). Goll, Johnson, and Rasheed (2008) found that the mean age of the top management has a stronger negative relationship to differentiation strategy in deregulated environments than in regulated environments.

Size of Founding Team

The presence of a founding team rather than a sole founder can fundamentally contribute to the diversity and extent of expertise and resources available to the firm as well as the balance of power and dynamics of interaction between/among founding members. According to Barringer, Jones, and Neubaum (2005), the relationship between founding teams’ size and firm growth has produced compelling results, with larger teams
having the advantage. Larger teams possess more talent, resources, and professional contacts than a sole entrepreneur (Barkman, 1994).

Founding teams are likely to be in a stronger position to negotiate terms in decision making with a favorable founding team. In addition, multiple founders increase the diversity of skills, knowledge, and experience of the top management team. Furthermore, founding teams can more effectively monitor the actions of the CEO, which results in reducing agency costs. However, diversity among the founders can bring conflict to the firm. Thus, there may be a tradeoff between positive and negative effects of the founding teams.

Founding team literature presents that founding teams' size is positively associated with diverse firm performance in new business ventures (Bruton & Rubanik, 2002). Halebian and Finkelsten (1993) argue that the top management team's size is positively associated with the firm's performance in a turbulent environment. Foo, Wong, and Ong (2005) found that larger top management teams receive higher external evaluations of teams' business ideas. Jayaraman, Khorana, Nelling, and Covin (2000) indicate that the impact of founder management on financial performance is more positive for smaller firms than larger firms and for younger firms than older firms. Ucbasaran, Lockett, Wright, and Westhead (2003) found that the size of the founding team is negatively associated with subsequent team member entry. Bharat and Filiz (2008) argue that the probability of the founder CEO at IPO is positively related to the size of the founding team.
Education of Founder and Founding Team

Education is a task-related characteristic that shapes the knowledge an individual brings to a task and the perspective taken by that individual (Tsui et al., 1995). Hambrick and Mason (1984) argue that managers with higher levels of education will have greater capability and expertise in information search activities.

Researchers have studied two approaches: level of education (Amason, Shrader, & Tompson, 2006; Barker & Mueller, 2002) and range of education (Hambrick, Cho, & Chen, 1996). Level of education is defined as the average number of years of education of the entrepreneurial founders and the members of the founding team. Range of education refers to heterogeneity of the fields of education. Shane and Venkataraman (2000) insist that the discovery of opportunities depends on the possession of prior information necessary to identify an opportunity and the cognitive abilities of individuals. According to Wiersema and Bantel (1992), a higher level of education is associated with higher information-processing capability. An individual with higher level of education may have the ability to discriminate among alternate stimuli. Higher levels of education of the top management team will open up more comprehensive decisions, leading to greater innovation (Bantel & Jackson, 1989).

Furthermore, scholars have suggested that specific forms of knowledge-intensive education provide the recipients of education an advantage if they start a firm that is related to their area of expertise. For example, Barker and Mueller (2002) found that a firm's R&D spending is positively associated with the number of science and engineering degrees earned by its CEO. Amason, Shrader, and Tompson (2006) argue that in new business ventures that are highly novel, negative relationships exist between the top
managers’ education level and range of education and venture performance. Wiersema and Bantel (1992) found that the firms most likely to undergo changes in corporate strategy had top managers’ higher educational level and educational specialization heterogeneity.

As a result, education has served as a proxy for entrepreneurial skills and abilities. Sapienza and Grimm (1997) argue that college education enhance search skills, foresight, imagination, and computational and communication skills. O’Reilly, Caldwell, and Barnett (1989) insist that communications and decision making in a heterogeneous team’s education are cumbersome because of the disparate perspectives and vocabularies. Heterogeneity can be a source of outright information blockage and conflict (O’Reilly, Snyder, & Boothe, 1993). Jackson (1992) suggests that the wide-ranging information and opinions available in a heterogeneous team require time to process. Otherwise, the homogeneous top management team may take fewer actions, but when it does it can act very quickly (Hambrick, Cho, & Chen, 1996). Thus, heterogeneous concentration of education can provide capacity to identify business opportunities and sources of rational decision making, but it can bring slow decisions and conflict in decision making.

**Experience Characteristics of Founder and Founding Team**

Scholars have investigated various types of experiences. Ucbasaran, Westhead, and Wright (2009) argue that experienced entrepreneurs identify more opportunities and exploit more innovative opportunities with greater wealth creation potential.
Functional Background of Founder and Founding Team

Hambrick and Mason (1984) made the distinction between output functions such as marketing/sales and product R&D and throughput functions such as production, accounting/finance and process engineering. Output functions emphasize growth, new ideas and opportunities, and new products and services while throughput functions emphasize efficiency of the transformational process. For example, Finkelstein and Hambrick (1996) and Hambrick and Mason (1984) show that CEOs with career experiences in output functions would tend to focus on organizational innovation and growth while CEOs with throughput-based functional backgrounds may be better equipped to ensure internal and external stability.

Research has supported direct and indirect effects of the founding team functional background on a new business venture’s performance. Furthermore, scholars provide distinctive dimensions of functional background, such as the type of functional background and functional background heterogeneity. Beckman and Burton (2008) examined how a founding team’s functional experience shapes initial functional structure. In addition, founding team functional experience consists of the breadth and depth of subsequent TMT functional experience. Barker and Mueller (2002) claim that a firm’s R&D spending is associated with the career experiences of its CEO, specifically, output function, not throughput function. Weinzimmer (1997) argues that functional heterogeneity is positively related to growth, and that there is not a significant difference between small and large firms.
Level of Industry Experience of Founder and Founding Team

Although new business ventures may learn from their own experience, others may have difficulty doing so, especially when that experience is limited. For example, new ventures obtain the necessary knowledge to network with others who have appropriate knowledge. Beckman and Haunschild (2002) argue that firms in networks composed of partners with heterogeneous experiences should be in a better position to benefit from the variety of partners’ experiences, and this benefit should be reflected in higher-quality decisions. However, the founding members with their various industry experiences in new business ventures may contribute to reduce the probability of networking with other firms.

Because knowledge of prior conditions can help managers understand the industry’s current dynamics, greater variation in the industry experience of the founding team is associated with higher growth among new business ventures (Eisenhardt & Schoonhoven, 1990). Thus, the impact of relevant industry experience on an entrepreneur’s ability to successfully launch and grow a firm has been studied. For example, managerial familiarity enables managers to detect emerging opportunities and new trends in the industry (Rubenson, 1989) and helps in evaluating alternative paths of investments and growth (Kor, 2003). In addition, managerial familiarity with technology and market conditions in a specific industry is a critical determinant of success among entrepreneurial firms (Roberts & Berry, 1985). In the absence of managerial experience in the industry, survival chances of new ventures drop significantly (Bruderl, Preisdorfer, & Zeigler, 1992) as they struggle to gain strong market positions (Kor, 2003).
Prior joint work experience among the founding team is one factor that might lead to speed in decision making. Eisenhardt and Schoonhoven (1990) argue that executives who have a history together have probably learned how to get along and communicate with one another. Furthermore, they are likely to have learned performance routines for making decisions quickly and are more likely to understand the idiosyncrasies and strengths of their colleagues than are teams formed by strangers.

Entrepreneurial founding teams with prior working experience together can save valuable time in building coordination and trust (Stinchcombe, 1965) and can focus quickly on firm problems, rather than on group-process issues. In consequence, greater previous joint work experience among the founding team is associated with higher growth among new business ventures (Eisenhardt & Schoonhoven, 1990).

Goodstein and O'Reilly (1988) argued that executive teams that had worked together previously were likely to be more cohesive and have higher trust than teams without such experience. Zenger and Lawrence (1989) found that individuals with previous work experience together communicated more often than people who did not.

Prior entrepreneurial experience is one of the most consistent predictors of future entrepreneurial performance (Singer, 1995). Launching a new business venture is a complex task, and entrepreneurs with prior start-up experience have a distinct advantage. In addition, experienced entrepreneurs are more likely to avoid costly mistakes than entrepreneurs without prior entrepreneurial experience.
Entrepreneurial founders may differ according to their prior levels of entrepreneurial experience (Ucbasaran et al., 2003). Gompers et al. (2005) argue that individuals with prior start-up experience are trained to be entrepreneurs by exposure to the entrepreneurial process. These individuals may encourage customers and suppliers to make relationship-specific investments (Hellmann, 2002).

Individuals with prior entrepreneurial experience are also likely to be correspondingly higher in risk-taking than others because they have made a conscious choice to become an entrepreneur (Jovanovic, 1979). Thus, entrepreneurs with start-up experience are often aware of the resources needed to create a successful new business venture, and from whom these resources can be secured (Kotha & George, 2012). Furthermore, serial entrepreneurs are more likely to raise capital from professional investors with greater ease (Gompers et al., 2005), which allows the entrepreneur to be selective in offering equity to fewer individuals (Kotha & George, 2012). Colombo and Grilli (2005) suggest that entrepreneurs with prior entrepreneurial experiences in new technology-based ventures contribute to higher growth than others without prior entrepreneurial experiences.

Organizational Tenure of Founder and Founding Team

According to Finkelstein and Hambrick (1996), during their tenure in the firm, managers become knowledgeable about the firm’s resources and develop a cognitive framework about the unique opportunities for the firm and what its strategy should be. Schwenk (1993) suggests that top managers’ organizational tenure influences performance either positively or negatively. The author argues that a team whose
members have longer tenure would be able to formulate more effective strategies because experience would result in deeper understanding of their company.

Kor (2006) argues that executives are likely to believe in the correctness of their view of the world. The founders also tend to receive less information, acquire task knowledge more slowly, and become more powerful. Otherwise, executives with long management tenure in their organization are associated with a passive decision making approach and resistance to changes to the firm’s strategy (Kor, 2006). Thus, founders with long tenure may develop strategies based on outdated assumptions of the environment leading to poor performance. This reflects the decision making bias that the past is a good prediction of the future (Tversky & Kahneman, 1974). Founders with longer tenure possess greater firm-specific human capital, making it less likely for them to take risks and compromise on the comfortable status quo (Finkelstein & Hambrick, 1990).

*Industry Tenure of Founder and Founding Team*

Delmar and Shane (2006) argue that specific industry experience is positively related to venture survival and success. They suggest that industry experience helps in three ways: (1) industry experience leads to greater information on the requirements of customers and their problems, (2) most of the rent-generating information on products and services is tacit and is available only through participation in the industry (Cohen & Levinthal, 1990), and (3) industry participation provides knowledge of the norms, practices, and routines in an industry.

The years of founders’ industry-specific work experience in technical and commercial functions differentially influence the growth of new technology-based
ventures (Colombo & Grilli, 2005). Eisenhardt and Schoonhoven (1990) argue that teams with individuals who have entered the industry at different times are likely to have different points of view about technology and competitive tactics. Entrepreneurs with long experience in the industry bring knowledge of how the industry operates. Otherwise, those with less experience bring freshness in perspective.

Homogeneity within a founding team may lead to inferior decision making because of groupthink and insufficient airing of conflict (Janis, 1982). Heterogeneity in founding team members’ industry experience tends to generate particularly constructive conflict (Eisenhardt & Schoonhoven, 1990). Founding members with experience in the same industry as their current venture will have a more mature network of industry contacts and will have a better understanding of the subtleties of their respective industries (MacMillan & Day, 1987). Colombo and Grilli (2005) argue that founders with tenure in the same industry are more positively associated with new technical-based firms’ growth than other founders with tenure in other industries.

Industry-specific experience embeds the tacit knowledge of the opportunities, threats, competitive conditions, technology, and regulations specific to an industry, as well as goodwill with industry players such as buyers and suppliers (Bailey & Helfat, 2003; Boeker, 1997; Cooper, Gimeno-Gascon, & Woo, 1994; Harris & Helfat, 1997; Mosakowski, 1993). In consequence, entrepreneurs are able to increase the legitimacy of the venture in the eyes of resource providers (Aldrich & Fiol, 1994). Entrepreneurs with relevant industry experience are more likely to be aware of the resources needed and the individuals from whom they can be secured (Hellmann & Puri, 2002). Therefore, a new
business venture in which the focal entrepreneur has industry experience is often more viable and valuable.

**Summary**

Scholars have investigated the effects of founding teams' characteristics on the firm's performance. Those include demographic and experiential characteristics. Such characteristics affect either positively or negatively firm performance. For example, entrepreneurial founding team heterogeneity is often associated with less duplication of human capital and improved decision making (Bantel & Jackson, 1989). However, heterogeneity can increase conflict within the team. Functional heterogeneity may create the effectiveness of ventures in decision making, identification of opportunity, and strategic choice.

Table 2.1 is the summary of the previous empirical research on entrepreneur founders' and founding teams' characteristics in the major journals of entrepreneurship (Journal of Business Venturing, Entrepreneurship Theory and Practice, Academy of Management Journal, Strategic Management Journal, Journal of Management, Management Science, and so on).
Table 2.1

Research on the Characteristics of Founder and Founding Team

<table>
<thead>
<tr>
<th>Author</th>
<th>Characteristics of Founder and Founding Team</th>
</tr>
</thead>
</table>
| Barker & Mueller (2002) | Founder CEO age  
  Founder CEO functional background  
  - Throughput/output functional experience  
  - Functional heterogeneity |
| Beckman & Burton (2008) | Founding team functional background |
  Founding team age  
  Founding team size  
  Functional background |
| Bruton & Rubanik (2002) | Founding team size |
| Colombo & Grilli (2005) | Founding team education  
  Industrial tenure  
  Level of industry experience  
  Start-up experience  
  Founding team functional background |
| Eigenhardt & Schoonhoven (1990) | Founding team joint work experience  
  Founding team size  
  Founding team industrial experience  
  Heterogeneity |
| Feeser & Willard (1990) | Founding team size |
| Kor (2006) | Firm tenure  
  Specific experience  
  Organizational Tenure  
  Functional Background heterogeneity |
Table 2.1 (Continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>Variables</th>
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<tbody>
<tr>
<td>Ucbasaran, Lockett, Wright, &amp; Westhead (2003)</td>
<td>Founding team size, Start-up experience</td>
</tr>
<tr>
<td>Ucbasaran, Westhead, &amp; Wright (2009)</td>
<td>Founder experience</td>
</tr>
<tr>
<td>Doutriaux (1992)</td>
<td>Founding team size, Industrial experience heterogeneity, Founder age</td>
</tr>
<tr>
<td>Sapienza &amp; Grimm (1997)</td>
<td>Founder industrial experience, Startup experience, Founder age, Founding team size</td>
</tr>
<tr>
<td>Box, White, &amp; Barr (1993)</td>
<td>Founder education, Age, Startup experience, Industrial experience</td>
</tr>
</tbody>
</table>
Types of Opportunities

Entrepreneurial Opportunity

A major step in any entrepreneurial venture creation process is the recognition of the opportunity by the founder(s) (Hills, 1995; Timmons, Muzyka, Stevenson, & Bygrave, 1987). Scholars (e.g., Casson, 1982; Eckhardt & Shane, 2003; Shane & Venkataraman, 2002) define entrepreneurial opportunities as situations in which new goods, services, raw materials, markets, and organizing methods can be introduced through the formation of new means (Eckhardt & Shane, 2003). Shane and Venkataraman (2000) argue that opportunities (1) arise in an idiosyncratic manner as a result of errors and omissions of others that cause surpluses and shortages (Casson, 1982), or (2) are the result of technological, political, regulatory, sociodemographic, perceptual, and other unexpected changes in the environment.

Entrepreneurial opportunities cannot be exploited by optimizing because the set of alternatives in introducing new products is unknown between all possible alternatives (Baumol, 1993). Therefore, while non-entrepreneurial decisions maximize scarce resources across previously developed means and ends, entrepreneurial decisions involve the creation or identification of new ends and means previously undetected or unutilized by market participants (Gaglio & Katz, 2001).

An identification of opportunity revolves around the information individuals possess and how they process it. Gaglio and Katz (2001) argue that a limitation of existing approaches to opportunity identification is that they ignore the heterogeneity of the founders. The notion of opportunity is at once enticing and dejecting. On the one
hand, it is so intuitive to think of any entrepreneurial initiative as a discovery, recognition, and identification and pursuit of opportunity.

Current empirical investigations suggest that the reason why founders differentially recognize different opportunities from the same stimuli may be found by examining three broad concepts: knowledge, cognition, and creativity. The literature suggests that differences between founders’ stocks of knowledge (Ardichvili et al., 2003; Shane, 2000) and their behavior are based upon their cognitive processing (Baron, 1998), and that these constructs are contributing factors as to why some people recognize opportunities while others do not. Moreover, a stream of literature is examining the links among creativity, cognition, opportunity, and entrepreneurship (Hills, Shrader, & Lumpkin, 1999; Lumpkin, Hills, & Shrader, 2004; Ward, 2004).

*Dimensions of Opportunity - Locus of Changes, Sources of Opportunities, and Initiator of the Change*

In their study on types of opportunities, Eckhardt and Shane (2003) consider three valuable ways of categorizing opportunities: by the locus of changes that generate the opportunity, by the source of the opportunities themselves, and by the initiator of the change. First, locus of changes assumes that entrepreneurial opportunities can occur as a result of changes in a variety of parts of the value chain.

There are five different loci of the changes: those that stem from the creation of new products or services, those that stem from the discovery of new geographical markets, those that emerge from the creation or discovery of new raw materials, those that emerge from new methods of production, and those that are generated from new ways of organizing (Schumpeter, 1934). Sources of opportunities include four ways of
categorizing opportunities (Eckhardt & Shane, 2003): information asymmetry/exogenous shocks, supply/demand side change, productivity-enhancing/rent-seeking opportunities, and the catalysts of change.

The final dimension on opportunities has been classified by the person that initiates the change. Different types of entities initiate the changes that result in entrepreneurial opportunities, and the type of initiator tends to influence the process of discovery as well as the value and duration of the opportunities. Researchers have argued that two sets of individuals have a critical role in the creation of technological opportunities: specialized knowledge creating agencies, such as universities or research laboratories that lie outside the industrial chain, and firms within the industrial chain, including suppliers and customers (Klevorick et al., 1995). Furthermore, scholars have examined the conditions under which the individuals within the industrial chain that generate opportunity-inducing changes are most likely to be users (Von Hippel, 1988), upstream suppliers, or the incumbent firms themselves (Klevorick et al., 1995).

**Opportunities Within and Outside Firms**

Dew, Velamuri, and Venkataraman (2004) argue that three phenomena (dispersed knowledge, Knightian uncertainty, and the heterogeneous expectations of economic agents) lead particular individuals to pursue particular opportunities. They refer to this as the individual-opportunity nexus. In the research, they identify two dimensions of opportunity identification: opportunities identified by individuals outside existing firms and opportunities identified by individuals within existing firms.

Opportunities identified by individuals outside existing firms are related to types of markets. Thus, new business ventures without appropriate knowledge on markets
select outsiders to exploit an opportunity to bring new products and services to the market or to use new production processes where the value of final outputs is unknowable at the time the resources are committed.

Otherwise, opportunities identified by individuals within existing firms are associated with internal knowledge. Penrose (1995) argues that existing firms have a natural perception corridor based on the knowledge of their employees, corporate goals, and incentive structures. In other words, existing firms often become the entrepreneurial party in the discovery and creation of new markets by invisibly extending their existing residual contract structure to new entrepreneurial opportunities. Entrepreneurs in existing firms often have a set of expectations that grant a higher valuation to particular opportunities than other stakeholders have. Thus, ventures seek endogenous growth when they have higher expectations of the value of an opportunity. These higher expectations are linked to the current knowledge base, current product markets, and current incentive structures.

*Types of Opportunity*

The life cycle of opportunities shows that founder(s) discovers a valuable opportunity, and that opportunity generates entrepreneurial profit, and that profit is likely to be transient due to external and internal factors. Eckhardt and Shane (2003) argue that entrepreneurial opportunities manifest themselves in a variety of different ways. In consequence, this section briefly summarizes the prior dimensions and types of opportunities.
Novelty-Centered Opportunity

Novelty-centered opportunities refer to new ways of conducting economic exchanges among various participants. A novel opportunity either creates a new market or innovates transactions in existing markets. The adoption of new ways of conducting transactions can be achieved by connecting previously unconnected parties, by linking transaction participants in new ways, or by designing new transaction mechanisms.

Novelty primarily aims at creating new ways of transactions. Novelty strengthens the focal firm’s bargaining power vis-à-vis other business model stakeholders. Zott and Amit (2007) argue that the higher the degree of business model novelty, the higher the switching costs for the focal firm’s customers, suppliers, and partners, as there may not be readily available alternatives to doing business with the focal firm. Coff (1999) argues that the firm’s ability to appropriate the value that its business model generates depends on factors like 1) the switching costs of other business model stakeholders, 2) the focal firm’s ability to control information, 3) the ability of other stakeholders to take unified action vis-à-vis the focal firm, and 4) the replacement costs of other stakeholders.

Novelty-centered opportunity will matter more to performance in periods of high resource availability, when founders’ dynamic governance costs are lower (Langlois 1992; Langlois & Robertson 1995), than in periods of resource scarcity. Founders can persuade, negotiate, and coordinate with resource holders more easily, and teach them about the merits of their innovative opportunities.

Zott and Amit (2007) argue that the more novelty-centered a new business venture’s business model design, the higher the firm’s performance. Thus, the higher the novelty of the opportunity identified, with respect to the new venture’s current activities,
the more difficult it will be to achieve a high degree of intersubjective agreement within the firm. Furthermore, the more objective the opportunity, the greater the intersubjective agreement outside the new business venture.

**Efficiency-Centered Opportunity**

Like novelty-centered opportunity discussed above, efficiency-centered opportunity in this research is employed from business model terminology in strategic management literature. An alternative way for founders to create wealth is to imitate rather than innovate. In other words, it is to do things similar to established firms, but in a more efficient way (Aldrich, 1999; Zott, 2003).

Efficiency-centered opportunities refer to the measures firms may take to achieve cost efficiency, not outcomes themselves. In other words, efficiency-centered opportunity is the measures that firms may take to achieve transaction efficiency through their business opportunity. The essence of an efficiency-centered opportunity is the reduction of costs (Williamson, 1975). Scholars (Clemons & Row, 1992, Langlois 1992; Milgrom & Roberts, 1992) argue that this reduction can derive from the attenuation of uncertainty, complexity, or information asymmetry, as well as from reduced coordination costs and transaction risk.

An efficiency-centered opportunity aims at reducing the costs for all business activities. The costs include managerial costs, transaction costs, and so on. By reducing costs, an efficiency-centered opportunity often leads to higher transaction volume. Thus, more new customers will be drawn to transact with the focal firm, and existing customers may transact more frequently as a result of the lowered transaction costs.
Another central aspect of efficiency-centered opportunity is that it enables better information flow among stakeholders and reduces information asymmetries among the parties. In general, this aspect does not negatively affect the focal firm's bargaining power. Moreover, the determinant of the focal firm's bargaining power is unlikely to be systematically affected in one direction or the other by design efficiency (Coff, 1999).

**Technological Opportunity**

Technology is broadly defined as knowledge that can be embedded in a product or service (Sarasvathy & Venkataraman, 2001). Technological opportunity refers to the degree to which a firm's market or industry demands or accepts product innovation (Cohen & Levinthal, 1990). It has a significant impact on innovative output and a firm's performance (Baysinger & Hoskisson, 1989; Kelm, Narayanan, & Pinches, 1995; Sharma & Kesner, 1996). Zahra (1996) argues that technological opportunity is the executive's perceptions of ability to support and generate growth opportunities through product and process innovations. Furthermore, technological opportunity represents how costly it is for the firm to achieve some normalized unit of technical advance in a given industry (Cohen & Levinthal, 1990).

There are two dimensions of technological opportunity (Cohen & Levinthal, 1989). The first refers to the quantity of extra-industry technological knowledge, such as that originating from government or university labs, and effectively complements and therefore leverages the firm's own knowledge output. The second dimension of technological opportunity is the degree to which a unit of new knowledge improves the technological performance of the firm's manufacturing processes or products and, in turn, the firm's performance.
Industries with high levels of perceived technological opportunities are usually characterized by rapid and frequent product and process technology introductions and high levels of R&D spending (Zahra, 1996). Thus, relative to the impact of an increase in the technological opportunity associated with applied science, an increase in that associated with basic science elicits more R&D. While innovation may lead to sustained competitive advantage, it often requires the investment of a significant amount of resources over a long time horizon, leading firms to diversify in the markets (Kobrin, 1991).

To succeed in industries with high technological opportunities, founders have to quickly process large amounts of information on their competition, market, and customers (Galbraith, 1973). In addition, a new venture in these industries must take risks and engage in corporate entrepreneurship, and spend heavily on developing products and technologies (Zahra & Covin, 1995). As a result, entrepreneurial founders in new business ventures are likely to reinforce the need for high motivation to have the vested interest and knowledge on technologies.

*Growth Opportunity*

Sandberg (1986) argues that new venture performance is a function of the entrepreneur, industry structure, and strategy. Murphy, Trailer, and Hill (1996) insist that growth can occur in many different aspects of a firm’s operations such as its cash flow, net income, customer base, sales, employment, and market share. Prior findings provide the empirical evidence that strong correlations exist among the three different size-based measures of growth: sales, employment, and market share (Baysinger, Meiners, & Zeithaml, 1982).
Otherwise, limited growth is not always associated with an inability to grow but may actually be reflective of a limited desire of the founders to grow the venture (Cliff, 1998). The belief that the new venture is an extension of the founders has led to many findings of the character traits of the founders that are most likely to influence the growth of the firm (Gilbert, McDougall, & Audretsch, 2006). Wiklund et al. (2003) argue that founders' attitudes toward growth are influenced by their beliefs regarding the extent to which a firm's larger size may compromise the well-being of employees, the independence of the firm relative to key stakeholders, the owner's ability to control the growth, and the ability to ensure that the firm would survive any crises.

Box and colleagues (1993) argue that the founders' belief that they could manage growth is very important for the firm's realized growth. The goals the founders set for growing the firm, the vision they communicate to their employees, and their belief in themselves to effectively execute the growth are significant factors influencing the growth of new business ventures (Baum & Locke, 2004).

Moreover, personality traits have been considered, most of which are believed to have not only direct but also indirect effects on the growth of the firms (Baum et al., 2001; Baum & Locke, 2004). Characteristics such as the educational background (Sapienza & Grimm, 1997), prior industry experience (Baum et al., 2001; Box et al., 1993; Cooper, Gimeno-Gascon, & Woo, 1994; Eisenhardt & Schoonhoven, 1990; Siegel, Siegel, & MacMillan, 1993), and prior start-up experiences of the founders (Baum et al., 2001; Box et al., 1993) have well-established direct effects on the sales and employment growth of new business ventures.
Exploration/Exploitation

Exploration involves experimentation with new alternatives with returns that are uncertain, distant and often negative, and is associated with the new venture's need for adaptability (March, 1991). Exploitation refers to the refinement and extension of existing competencies, technologies and paradigms with returns that are positive, proximate, and predictable. Exploitation is associated with the venture's need for alignment. Exploration activities are captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, and innovation (March, 1991). In contrast, exploitation activities include refinement, choice, production, efficiency, selection, implementation, and execution (March, 1991).

Researchers have argued that exploration and exploitation draw on different structures, processes, and resources (He & Wong, 2004), generating significantly different outcomes over time. Moreover, the distinction between exploration-oriented and exploitation-oriented activities is widely used across organizational literatures (Gupta et al., 2006).

By reducing variety, increasing efficiency, and improving adaptation to current environments, exploitation activities often lead to positive short-term performance impact. However, these short-term performance improvements might come at the expense of long-term performance, because the reduced variety and the adaptation to the external environment become liabilities as environments change over time.

Opportunity exploitation is to build efficient, full-scale operations for products or services created by, or derived from, a business opportunity (Choi, Levesque, & Shepherd, 2008). For most founders, opportunity exploitation is a necessary step to
generate revenues and thus create a successful business (Block & MacMillan, 1985; Schoonhoven et al., 1990). For identification of opportunity, new business ventures that emphasize exploitation activities might lack the capability to adapt to significant environmental changes, and thus the recipe that makes these firms successful in the short term might endanger their success in the long run.

Otherwise, the venturing process starts with an exploration of that business opportunity. During the exploration period, founders attempt to reduce their ignorance about technology and markets through knowledge accumulation arising from experimentation and search such as market research on customer demand and further development and testing of technologies (March, 1991; Rice, 2002).

In consequence, exploitation is associated with the production startup milestone (Block & MacMillan, 1985) or full-scale operation, which requires full commitment of the new venture's resources in building efficient production and business systems (Choi & Shepherd, 2004). A conceptualization of the entrepreneurial process through a simple sequence of exploration-then-exploitation is consistent with theoretical (Aldrich, 1999; Bhave, 1994) and practical (Block & MacMillan, 1985) perspectives, which view the entrepreneurial process as sequential milestones. Block and MacMillan (1985) argue that opportunity exploration encompasses activities from multiple milestones including concept and product testing, completion of prototype, completion of initial plant tests, and market testing.

**Types of Strategies: Differentiation vs. Efficiency**

In the entrepreneurship literature, it is well established that the strategies pursued by new business ventures have a direct and strong influence on the financial performance
of those firms (Lambkin, 1988; McDougall, 1987; Sandberg & Hofer, 1987). In the strategy literature, strong links have also been found between the characteristics of top management teams and strategies pursued by established firms (Bantel & Jackson, 1989; Hambrick, 1982; Wiersema & Bantel, 1992). However, these insights have little been applied to research on new business ventures. While these studies imply that managers and strategies each directly influenced performance, another body of literature suggests that performance is best explained by the fit between managerial characteristics and strategies (Litschert & Ramaswamy, 1991; Norburn & Birley, 1988; Pettigrew, 1992).

Superior performance results when founding teams have backgrounds and experience that are especially relevant to the particular strategies of new business ventures. For example, a venture pursuing a strategy of radical innovation might require younger, more educated founders. Founding teams’ characteristics such as experience should influence strategic choice and firm performance among new business ventures. That is, human capital theory suggests that an experienced founding team should be more productive than a less experienced team, since experience is a valuable asset that has been shown to increase worker productivity and the economic value of the firm.

Experience also allows founding teams to make more informed strategic choices. More specifically, specialized experience in functional areas relates to the strategies pursued by a new business venture. Functional experience represents a resource that can enhance a venture’s ability to formulate and implement specific strategies.

For the effects of types of strategies, this study uses Porter’s (1980) framework containing two opposite types: the low-cost leadership strategy and the differentiation strategy. Porter (1980, 1985) describes the following as characteristics of businesses with
a low-cost leadership strategy: (1) vigorously purchasing cost reduction, (2) employing people with high levels of experience and practicing all possible economies of scale, (3) acquiring process engineering skills, or the skills needed in order to design an efficient plant, (4) routinizing the task environment, and (5) producing a standard, undifferentiated product (Govindarajan & Fisher, 1990). A standard product or service with a routine task environment implies that the knowledge of ends and means is relatively high, which indicates high task programmability. As Porter (1980) pointed out, the primary focus of a firm with a low-cost leadership strategy is cost control.

Miller (1991) argued that the differentiation strategy was composed of two dimensions: product differentiation and market differentiation. The first, product differentiation, is concerned with product innovation. The second, market differentiation, refers to the use of marketing techniques to achieve perceptual distinction. Product differentiation enables the venture to use its technological expertise to develop new and innovative products. It also enables the new venture to adapt its products to the needs of specific markets.

New business ventures pursuing a differentiation strategy attempt to produce a unique product. In general, in producing such product, knowledge of means and ends is low, so the task of producing and marketing a unique product implies low task programmability. The key success factors for a differentiator include creative flair, strong basic research, and product engineering (Porter, 1980).

Porter (1985) and Gupta and Govindarajan (1986) noted the possible costs and benefits of resource sharing. According to the scholars, the major costs of higher levels of resource sharing include the cost of coordinating the members of units that share a
resource and the cost of reduced flexibility at the individual business unit level. On the benefit side, high resource sharing may yield a synergistic cost advantage (Gupta & Govindarajan, 1986). Such synergy is similar to an economy of scope. In addition, Porter (1985) argues that resource sharing can enhance differentiation by contributing to the uniqueness of an activity and by lowering the cost.

**New Venture Performance and Survival**

The belief that the entrepreneurial firm is an extension of the entrepreneur has led many researchers to examine the character traits of the entrepreneur that are most likely to influence the growth and survival of new business ventures. Researchers have considered various types of performance to investigate the effects of founders’ and founding teams’ characteristics in new business ventures. Thus, firm performance factors considered as dependent variables by researchers are reviewed in this section.

**Financial Performance**

Financial performance measures have been mainly used as the dependent variables in research investigating the impacts of founders’ and founding team’s characteristics. Amason, Shrader, and Tompsoon (2006) argue that new venture performance should be measured based on three dimensions: sales growth, profitability, and stock market returns. For example, Jayaraman, Khorana, Nelling, and Covin (2000), investigating the impact of founder management on financial performance, used a stock performance measure. The stock market valuation of a firm is the present value of future expected cash flows to its shareholders. The authors indicate several reasons to use a stock-based performance measure.
First, unlike performance measures based on accounting data, stock-based performance measures are not influenced by firm-specific financial reporting rules. Second, the use of a stock-based performance measure is consistent with an important principle in corporate finance. Finally, an inherent advantage of using stock market data in performance comparisons is that they provide an explicit means for controlling differences in risks, since investors will assign a lower present value to risky cash flows.

Halebian and Finkelstein (1993) used three indicators of financial performance: return on assets, return on sales, and return on equity. Amason, Shrader, and Tompson (2006) examine the relationship between top management heterogeneity and average growth in sales calculated for each firm for the three years subsequent to its IPO. In their study, industry effects were controlled by subtracting industry average return on sales (ROS), assets (ROA) and equity (ROE) from each firm’s measures. Finally, they employed a measure of stock market performance. For each firm, they calculated growth in price per share during the 3-year period subsequent to the IPO, controlling for all splits and dividends. The resulting number is the net return to shareholders, taking into account the value of the firm’s assets-in-place as well as future earning opportunities (Miller & Modigliani, 1961; Piwdyck, 1988).

**Growth of Employment**

Rather than a commonly used measure of new venture performance, in some cases, growth in the firm’s employment has been used (McDougall & Oviatt, 1996). Growth in employment indicates that a new venture’s sales are increasing (Brush & VanderWerf, 1992). Eisenhardt and Schoonhoven (1990) used growth of employment when they examined the liability of newness in high-technology firms in Silicon Valley.
They measured the firm’s growth as the difference in sales in each year of life. They used this growth measure instead of alternative measures such as percentage growth and growth rate for several reasons. First, it measures the absolute change in size of each firm from a common starting point, the founding of the firm. Second, it is computationally tractable. Lastly, the growth rate is simply their measure of growth divided by the time period.

Firms are unwilling to hire an individual unless they have a strong need for the person and can generate the cash flow to support the person’s employment. This is particularly true for new business ventures, which have very limited resources. Therefore, the growth in employment of the new business ventures is an indication that the firm’s sales are also growing; sales growth has previously been used to determine the impact of mitigating factors of the liability of newness (Eisenhardt & Schoonhoven, 1990).

Bruton and Rubanik (2002) used the annual percentage growth in employment for new business ventures as the dependent variable. In their study, the annual percentage growth in employment was determined by calculating the total percentage growth of the firm’s employment over the life of the new venture divided by the number of years the firm has been in existence.

**Organizational Strategy and Structure**

Business strategy and structure are also correlated to firm performance in the research on entrepreneurial characteristics. For example, Goll, Johnson, and Rasheed (2008) include three measures of business strategy: differentiation, low cost, and scope. In their study, three variables were used to measure a differentiation strategy.
Beckman and Burton (2008) apply three measures of dependent variables: functional organizational structure, team member functional experience, and firm outcomes. Functional organizational structure is measured as to whether the firm has defined executive-level positions in each of the following six functional areas: sales and marketing, general administration (including human resources), science/ R&D/ engineering, operations, business development/strategic planning, and finance/ accounting.

A firm's growth pattern and the composition of its business portfolio are likely to reflect decisions on the amount of resources allocated to specific areas. Porter (1987) argues that a firm’s diversification posture captures the moves its management has made to establish business positions in different industries. In examining the effects of the top management team demographic characteristics on firm performance, Wiersema and Bantel (1992) used strategic change as the performance variable. In their study, strategic change was measured by the absolute percentage change in diversification strategy over the period 1980-1983. The concept of corporate diversification captures the variety and relative distribution of a firm's lines of business (Rumelt, 1974). Management can select to alter a firm's diversification strategy by adding new business activities, dropping or divesting existing business activities, or pursuing corporate growth through expansion in its existing lines of business.

Innovative Performance

Scholars have included innovative variables to examine new business ventures' performance. In this vein, a number of researchers have used R&D spending per employee as a measure of R&D intensity, arguing it is more stable than the most common
alternative, R&D spending divided by firm sales (Baysinger et al., 1991; Hill & Snell, 1989; Scherer, 1984). R&D investment intensity is typically calculated as the level of investments divided by the firm’s sales, assets, or number of employees (Dowling & McGee, 1994; Ettlie, 1998; Fryxell, 1990; Hill & Snell, 1988; Scherer; 1965).

Kor (2006) employed R&D investment intensity as a dependent variable to examine the relationship between the top managers’ characteristics and firm performance. Barker and Mueller (2002) used R&D spending as the dependent variable. In their research, R&D spending was the total R&D dollars spent per employee by each firm relative to its industry average.

External Evaluation of the Team’s Business Idea

Foo, Wong, and Ong (2005) applied the external evaluation of the team’s business idea as a firm performance measure. In their research, judges’ evaluation of the teams’ business ideas were used as the criteria. One hundred and thirty-one judges were selected based on their experience in evaluating business plans and involvement in new venture activities. The judges included professional investors, business founders, private investors, legal professionals involved with start-up companies, and patent experts. All the judges used the same rating form and were asked to rate the plans as if they were real start-ups seeking funding.

Survey

Gielenik, Zacher, and Frese (2010) used survey items to identify new venture growth. In their research, venture growth was measured with five items adapted from Krauss et al. (2005). The items ask business owners to indicate percent changes in sales,
profit, transaction volume, income, and number of employees in the fiscal year compared to the previous year.

The Relationship Between Types of Opportunities, Types of Strategies, and Characteristics of Entrepreneurs and Founding Team and New Venture Performance

As scholars (Alvarez & Barney, 2007; Klein, 2008; McMullen & Shepherd, 2006; Shackle, 1995; Shepherd, McMullen, & Jennings, 2007) have discussed, founders create opportunities, an opportunity is intertwined with individual beliefs, and an opportunity exists only in the founder's imagination.

Founders who create new business ventures are equipped with a stock of knowledge that they can apply in the process (Gruber, MacMillan, & Thompson, 2008). Pelled et al. (1999) argue that founders often have preexisting knowledge that affects the knowledge available to the firm, the ability of the founders to access and use the knowledge, the information-gathering and information-processing behavior, and the number and variety of solutions that will be generated.

According to Delmar and Shane (2006), prior entrepreneurial experience provides a particular type of knowledge that cannot be acquired easily through other types of learning, because it has many tacit components that are learned by doing. In this vein, founders with preexisting knowledge develop refined and complex cognitive structure as they gain experience in a particular area. Through their previous experiences, entrepreneurial founders have developed specific insights on the process of qualitative judgment. In terms of opportunity identification, such founders' and founding teams' sophisticated judgment capability can enhance the process of opportunity identification.
Chrisman, Bauerschmidt, and Hofer (1999) argue that new venture performance will be primarily a function of the critical decisions and behaviors of entrepreneurs in recognizing environmental opportunity, assembling resources needed to pursue opportunity, developing a strategy to align resources to exploit opportunity, and designing an organization capable of putting the strategy into action. Thus, business opportunity identification in a new business venture is critical for the firm’s growth and even survival. On the other hand, entrepreneurial founders and founding teams’ characteristics, such as demographics and experiences, can enhance the identification of qualified market opportunity.

For example, Baron and Ensley (2006) suggest that experienced founders have acquired richer and more refined cognitive representations of business opportunities than novices, which helps them pursue opportunities most likely to yield positive financial outcomes. Whereas novice entrepreneurs emphasize evaluation criteria such as the novelty of the idea, the superiority of the product or service, and the potential to change the industry, repeat entrepreneurs look for business opportunities that will quickly generate positive cash flow, have a manageable level of risk, and solve a customer’s problem. As a result, there are both direct and indirect relationships among the entrepreneurial founders’ characteristics, business opportunity, and firm performance.

The strategies in new business ventures directly influence financial performance (Lambkin, 1988; McDougall, 1987; Sandberg & Hofer, 1987). Scholars have found strong linkage between the characteristics of top management teams and strategies pursued by established firms (Bantel & Jackson, 1989; Hambrick, 1982; Wiersema & Bantel, 1992). In this vein, the business strategy may be more important for the new
ventures' survival and growth because the ventures often possess limited resources. Therefore, the founding teams' characteristics are likely to be critical to pursue more effective strategy in new business ventures.

As discussed above, founders in new business ventures are likely to have different demographic and experiential characteristics. These differences lead to other knowledge, skills, and ability of the founders to identify business opportunities. Hence, the relationships between the characteristics and opportunity identification result in a different level of the firm's performance. In addition, a specific type of performance may be associated with the relationships between the founders' characteristics and the types of opportunities.

Theoretical Background and Hypothesis Development

This dissertation employs cognitive theory, human capital and the insights of entrepreneurship literature, and the knowledge-based view to explain the relationship between founding team characteristics and firm performance in new business ventures. The following section is a review of these theories. Then, hypotheses are developed.

Cognitive Theory

Neisser (1967) defines cognition as all processes through which sensory input is transformed, reduced, elaborated, stored, recovered, and used. The cognitive perspective argues that everything people think, say, or do is influenced by mental processes, the cognitive mechanism through which they acquire, store, transform and use information, which can be invaluable to understanding why some people and not others identify opportunities (Baron, 2006).
The cognitive research explains how each founder’s mental makeup is related to his or her ability to identify and exploit an entrepreneurial opportunity (Corbett, 2005). The conceptualization of cognition (Cacioppo & Petty, 1982) provides the foundation for understanding entrepreneurial opportunity identification from a motivation-based cognitive approach. Prior researches argue that recognition abilities differ because individuals have different pieces of the world’s totality of information (Hayek, 1945), and people rely on different cognitive mechanisms or heuristics (Baron, 1998; Busenitz & Barney, 1997). Related research suggests that creativity, cognition, and opportunity identification processes are correlated (Lumpkin, Hills, & Shrader, 2004; Ward, 2004).

Scholars also argue that differences in founders’ knowledge stocks and the various manners in which each might process information are related to opportunity identification (Shane, 2000). Cognitive mechanisms and heuristics are not synonymous with learning. Cognitive theories offer various methods for understanding the processes underlying opportunity identification. Cognitive mechanisms and heuristics are two ways in which a founder puts his or her knowledge into action. In contrast, learning is a social process by which knowledge is created through the transformation of experience (Kolb, 1984). Previous models (Long & McMullan, 1984; Teach, Swartz, & Tarpley, 1989; Timmons, Muzyka, Stevenson, & Bygrave, 1987) that tried to conceptualize different aspects of the entrepreneurial process were developed before the re-birth of opportunity research (Venkataraman, 1997).

Schema theory also explains how founders identify opportunities (Gaglio & Katz, 2001). Schemas are known as shared knowledge or cognitive structures and represent the content and organization of knowledge, and develop as a result of the cumulative
experience, learning and meanings a founder has encountered and constructed about a specific domain (Gaglio, 1997). Schemas determine how founders respond to new information.

Similarly, drawing upon prototype theory, Baron (2004) insists that prototypes have a critical role in identifying opportunity. Through formal education and experience, founders acquire prototypes that serve as templates for opportunity identification. A prototype for an opportunity is likely to include features such as novelty, practicality, market appeal, and the ease with which necessary resources can be obtained. A new idea that is closely matched against an existing prototype of an opportunity may be identified as an opportunity.

As a result, the cognitive approach is concerned with the founder’s preferred way of gathering, processing, and evaluating information (Allinson, Chell, & Hayes, 2000). The founder constructs opportunities and risks in his or her mind (Palich & Bagby, 1995). Therefore, perception and other cognitive phenomena are critical to opportunity evaluation and risk perception (Krueger, 2000). For example, founders often find themselves in situations that are new and unpredictable. They are less likely to have access to historical trends, past performance, and other information to reduce the level of uncertainty at a relatively low cost (Busenitz & Barney, 1997). In addition, it is not possible for more comprehensive decision making because founders need to act quickly to exploit brief windows of opportunity (Busenitz & Lau, 1996). Consequently, founders seek to minimize cognitive effort by using heuristics and simplifying strategies that lead to a number of cognitive biases.
Furthermore, researchers (Baron, 1998; Busenitz & Barney, 1997) argue that focusing attention on the individual founder and the unique resources that he or she brings to a venture has provided significant progress in understanding how founders think and make strategic decisions. If founders do indeed have a unique cognitive structure, then it follows that they have the potential to generate a competitive advantage. One of these advantages may be the recognition of new opportunities (Alvarez & Busenitz, 2001). For instance, the cognitive ability of founders encourages them to readily make sense out of uncertain and complex environments. Their knowledge structures may enable them to cut through massive amounts of information and chaos to see a pattern and a potential opportunity. Finally, those founders with an entrepreneurial cognition are likely to gain a competitive advantage by learning more quickly and by making faster decisions that facilitate the development of new opportunities.

In summary, founders are likely to construct their own cognitive structures through formal education and experiences. Such structures enable founders to absorb new knowledge easily and accumulate related information. Finally, the cognitive structures generate efficient processes of gathering new information and decision making for opportunity identification and business strategy in new business ventures.

**Founders' Human Capital**

A founder has unique skill, ability, and experience. Those attributes describe the extent to which a founder has acquired in his/her knowledge and can subsequently apply such knowledge to the tasks as required. Investments in human capital can be made through accumulating knowledge both through experience and education. Human capital may be either general or task specific in nature, in that some skills and learning may be
easily applied in many settings, and consequently transferable, such as education and
general work experience, while some human capital may be of a specialized nature which
can only be applied in specific settings, such as experience or technical skills within a
particular industry (Becker, 1964).

Education and experiences are valued because they enable founders to know
where to go to obtain information relevant to the venture and also how to deploy the
resources they obtain (Kirzner, 1983). For this reason, a founder’s prior experiences in an
activity will provide competencies that influence the decisions he or she makes regarding
a given activity (Buchele, 1967; Mullins, 1996; Scherer, Adams, & Wiebe, 1989;
Susbauer, 1979). Thus, a founder with related experience makes better decisions than a
founder who lacks similar experience.

Furthermore, researchers (Gilbert, McDougall, & Audretsch, 2006) have found
that when new business ventures are founded by teams, rather than individuals, the
experiences of the founders are of substantial importance. Under these circumstances,
their tenure together, as well as their background heterogeneity and number of
individuals involved, are important for the sales growth of the firms (Eisenhardt &

Ensley, Pearson, and Amason (2002) argue that the tenure of teams is influential
for sales growth as it makes communication between members easier. Team size is also
important because it enables the firm to distribute responsibility across a greater number
of individuals. Larger team size, however, can lead to higher levels of disagreement
between team members, especially when the team is diverse. Lant, Milliken, and Batra
(1992) suggest that such disagreements, however, can lead to more extensive discussions
of strategic options, more learning opportunities, and, thereby, reduce the likelihood of a
groupthink type phenomenon occurring. West and Meyer (1998) argue that disagreement
is shown to correlate positively with the growth of firms relative to their competitors.

Gielnik, Zacher, and Frese (2012) investigate the mediating effect of focus on
opportunities on the negative relationship between business owners' age and venture
growth. They also argued that mental health moderates the negative relationship between
business owners' age and focus on opportunities.

The likelihood of survival for new business ventures and the growth have
generally been found to be positively related to the founding team’s human capital, such
as age, education, and experience. Researchers, for example, have provided evidence that
there is a positive relationship between the human capital and the wealth of individuals
(Astebro & Bernhardt, 1999; Xu, 1998). Colombo and Grilli (2005) argue that the
positive relation between the post-entry performances of new technology based firms
(NTBFs) and the human capital of their entrepreneurs is often traced to the wealth effect
of human capital, simply revealing the presence of binding financial constraints. Hence,
the distinctive capabilities of new business ventures are closely related to the human
capital of their founding members. These depend on what founding members learned
through formal education and prior experiences. Accordingly, new business ventures
established by founders with greater human capital should outperform other ventures
because of their unique capabilities. It is the capability effect of the founding team’s
human capital that explains its positive impact on the performance of new business
ventures.
Previous studies have provided evidence of the relation between founders’ human capital and new ventures’ survival and growth. A distinction is often made in the literature between generic and specific human capital. Generic human capital relates to the general knowledge acquired by founders through both formal education and experience. In contrast, specific human capital is the capabilities that founders can directly apply to the entrepreneurial job in their firms. These include knowledge of the industry in which the new venture operates; that is, industry-specific human capital obtained by founders through prior work experience in the same industry. They also include knowledge of how to manage a new business venture. This is developed by founders through leadership experience (Bruderl et al., 1992) obtained either through industry experience.

In empirical works, the generic human capital of the founders of a new business venture is proxied by education attainments and by the years of work experience before establishing the new venture. As to specific human capital, previous researches consider whether founders have experience in the same area of the new venture as a proxy of industry-specific human capital, and have prior self-employment or managerial experiences as proxies of entrepreneur-specific human capital (Colomb & Grilli, 2005).

Founders with greater human capital are likely to have better entrepreneurial decision making. Specifically, founders with great human capital are in an ideal position to identify neglected business opportunities and to take effective strategic decisions that are crucial for the success of the new venture. On the one hand, what founders know and can do is associated with what they learned in the organization with previous experiences (Cooper, 1985; Cooper & Bruno, 1977). If the business of the new venture is closely
related to the one of the incubating organization, the new venture can exploit the knowledge about technologies, customers' needs, and competitors' strengths and weaknesses and the contacts with potential customers and suppliers that founders developed in their previous occupation (Feese & Willard, 1990; Shepherd et al., 2000).

The insights of entrepreneurial literature indicate that the exercise of entrepreneurial judgment benefits from learning by doing, as it is a cumulative process of identification and discovery (Loasby, 1995). In consequence, there is an advantage in already knowing how to set up and manage a firm. Furthermore, successful exploitation of a new business opportunity generally requires the integration of complementary context-specific knowledge.

In addition, founders are likely to be passionate about their firms and possess a unique vision for them (Nelson, 2003). Jayaraman and colleagues (2000) argue that founders highly value their reputational stake in the firm and exert a greater effort to ensure the firm's success. Founding members tend to be familiar with the managerial structure, the balance of power among managers and board members, and previous ways of doing things (Kroll et al., 2007). Founders also tend to own a significant fraction of their firm's equity, granting them substantial power and control (Wasserman, 2003). Furthermore, founders are likely to be psychologically attached to their founding firms. For example, Gimeno and colleagues (1997) demonstrate that founders tend to sacrifice to keep their firms afloat longer than non-founders. Wasserman (2003) suggests that founders may accept lower compensation for the sake of their firm survival and growth. As a result, founders with great human capital often dominate the decision making in the firm.
In summary, entrepreneurial literature has examined the positive relationships between the human capital of the founding team and growth and survival of new business ventures. Human capital of the founding team includes the level of education, the specific area of education, industry experience, entrepreneurial experience, and so on. In addition, the characteristics from the insights of entrepreneurial literature such as accumulated managerial knowledge of the firm and domination in decision making are also critical components of founding team human capital. As a result, founding team human capital is likely to have benefits in entrepreneurial decisions, opportunity identification, and even implementation of strategies in new business ventures.

**Knowledge-Based View**

The resource-based view (Barney, 1991) suggests that resources can provide competitive advantage when the resources are valuable, not perfectly mobile, neither perfectly imitable nor substitutable. However, new ventures in initial stages of life are likely to have limited resources, especially financial and organizational resources. Thus, new business ventures may largely depend on their founders’ knowledge and experience as a source of competitive advantage.

Learning refers to the process by which new information is incorporated into the behavior of agents, and changing their patterns of behavior and possibly leading to better outcomes. Therefore, knowledge is the cumulated information through learning. According to Nonaka and Takeuchi (1995), knowledge is shown as justified true belief and the focus of theories is on the explicit nature of knowledge. Leonard and Sensiper (1998) define knowledge as information that is relevant, actionable, and at least partially based on experience. This view of knowledge includes contextual information, framed
experience, values, and expert insight (Davenport & Prusak, 1998). Organizational learning is part of the foundation that underlies knowledge-based thinking.

The Role of the Knowledge-Based View

The knowledge based view (KBV) offers numerous useful and empirically grounded insights into the multi-level social processes through which knowledge is sourced, transferred, and integrated, within and across organizations. The knowledge-based approach of a venture tends to analyze how organizations create, acquire, apply, protect, and transfer knowledge. Bierly and Chakrabarti (1996) contend that competitive advantages could be generated by the knowledge possessed by a firm and the ability to develop it.

Cohen and Levinthal (1990) argue for organizational learning and innovation to the evolving knowledge base of the firm. The scholars define absorptive capacity as the ability to recognize the value of external information, assimilate it, and apply it to commercial ends. Absorptive capacity is a function of the level of the firm's former knowledge that emphasizes the cumulative nature of knowledge and its history or path is dependent on the importance of prior decisions. Important determinants of absorptive capacity are the internal channels of communication, the distribution of knowledge in the environment and in the firm, and the pattern of R&D investment decisions. Specifically, in an environment where knowledge development is widely dispersed and learning requires a strong knowledge base, internal R&D efforts will more significantly contribute to absorptive capacity (Cohen & Levinthal, 1990).

Dierickx and Cool (1989) conceptualized the firms' knowledge in terms of stocks and flows. Stocks of knowledge are accumulated knowledge assets, while flows are
knowledge streams within and across organizations that contribute to the accumulation of knowledge. Superior stocks and flows are regarded as sources of sustained competitive advantage. In addition, Kogut and Zander (1992) suggested the strategic importance of knowledge as a source of advantage and established the foundation for a theory of the venture. The researchers argue that what firms do better than markets is the creation and transfer of knowledge within the organization. In their view, knowledge is held by individuals, and yet it is also embedded in the organizing principles by which people voluntarily cooperate in an organizational context.

The creation of new knowledge depends on existing capabilities and organizing principles. Therefore, the knowledge of the venture evolves in a path-dependent way, through the replication and recombination of existing knowledge. The venture’s rate of growth depends on the ability to replicate knowledge, but that replication also facilitates imitation by competitors. New ventures may grow and deter competitive imitation only by continuously recombining their knowledge and applying it to new business opportunities. Therefore, superior performance can be sustained through continuous innovation. In other words, knowledge permits a reduction in uncertainty (Beijerse, 1999) and makes reality meaningful.

**Knowledge Breadth and Depth**

Entrepreneurship literature argues for the tensions between knowledge breadth and depth at the level of organizations (Gilad, 1984). For example, entrepreneurship has been referred to as the process of creating value by bringing together a unique package of resources to exploit an opportunity (Stevenson, Roberts, & Grousbeck, 1989). It is a
process that reflects the tension between knowledge components inherent in the entrepreneur’s creative process.

The diverse literature on knowledge agrees that two knowledge components, breadth and depth, are required at different stages of an innovative process (Gordon, 1961). Knowledge breadth refers to lateral thinking (de Bono, 1968), metaphorical thinking (Gordon, 1961), and expanded problem definition (Adams, 1974). These are related to the diversity and flexibility of viewpoints and approaches in attempting to solve a problem. Knowledge depth refers to vertical thinking (de Bono, 1968), fluency, and constrained problem definition (Adams, 1974). These are associated with the level of expertise to analyze a given problem with existing data. Winslow and Solomon (1987) argue that creative individuals are thought to embody a tension of lateral and vertical thinking. The tension arises from the pull between the simultaneously opposing forces.

The breadth of knowledge may result from interaction with a broad range of products and services as well as interaction with a broad range of constituents. Knowledge breadth is often related to a function of a founder’s tendency to view all issues that arise as equally important as opposed to a tendency to prioritize and selectively attend to a subset of issues. As a result, the breadth of knowledge improves the quality of the decision making process. On the other hand, organizational members may occupy roles that require varying levels of expertise in a particular aspect of the business, and varying levels of knowledge depth. Consequently, deeper knowledge encourages founding teams to reduce risk and improve efficiency in a decision making process similar to previous experiences.
Knowledge Relatedness

Knowledge relatedness is defined as the degree to which knowledge that is perceived as necessary to exploit an opportunity is similar to the knowledge already possessed by the potential entrepreneur (Mitchell, 2006). Grant (1996) argues that related knowledge encourages the ability of the firm to evaluate effectively the value of external knowledge, to discard irrelevant knowledge, and to concentrate its learning efforts on valuable knowledge sources. To deal with the inflow of information, new business ventures need to develop information filters for identifying valuable knowledge and rejecting irrelevant knowledge. New business ventures learn efficiently close to their existing knowledge domains. Local optimization contributes to a higher operational efficiency (Levinthal, 1997).

On the other hand, minimal knowledge relatedness hampers learning because assimilation of knowledge suffers. Extreme knowledge hampers learning because the potential for novel knowledge combinations is reduced. As a result, learning should be a curvilinear function of the knowledge relatedness between the knowledge bases of the respective firms. In short, up to some point, increases in absorbed knowledge overlapping with the prior knowledge should increase the productive capacity of new business ventures, thereby enhancing their potential for growth. Related knowledge also contributes to the efficiency of communicating external knowledge and of assimilating it into the pre-owned firm’s knowledge base (Grant, 1996; Nahapiet & Ghoshal, 1998).

Summary

As organizational learning is largely driven by knowledge combination, a new venture needs to become efficient in combining and assimilating diverse items of
externally sourced knowledge with its internal knowledge base (Cohen & Levinthal, 1990; Kogut & Zander, 1992). To achieve this and to grow, young firms need to establish learning relationships with external sources of knowledge (Liebeskind, 1996; Powell et al., 1996; Zahra & George, 2002). The more different the combined knowledge items, the greater the novelty value of the created new knowledge.

Cohen and Levinthal (1990) argue that knowledge diversity contributes to learning by enabling individuals to make new associations between apparently unrelated knowledge items. As the amount of related knowledge increases and unrelated knowledge diminishes, the potential for new knowledge creation will be diminished. A very high overlap between the firm’s knowledge with the external knowledge arises to be redundant, hurting its ability to create novel combinations based on external knowledge.

**Hypotheses Development**

As reviewed above, scholars have produced evidence that founding team characteristics have critical roles in growth and even survival of new business ventures. The characteristics include demographic characteristics and experiences. Entrepreneur founders or founding teams establish firms with an idea or a vision and compete using unique knowledge. Through their own mental processes, they recognize and perceive information inside and outside of the firms.

Cognitive theory explains the processes of how efficiently an entrepreneurial founding team accumulates knowledge, identifies market opportunities, and implements firm strategies. Researchers on human capital have found positive relationships between founding team human capital and firms’ outputs (Astebro & Bernhardt; 1999; Xu, 1998). Knowledge is a core dimension of human capital. As Cohen and Levinthal (1990) argued,
knowledge through the learning process enforces absorptive capability. Knowledge is accumulated by formal education and experiences.

This research investigates the effects of founding team characteristics, especially knowledge and experience, on firm performance in new business ventures. In addition, this study is interested in the moderating effects of business opportunities and strategies on the relationships between founding team knowledge and the firm's performance in new business ventures. In consequence, founding team formal education, industry experience, and entrepreneurial experience are considered as the independent variables in this study, because these factors are the sources of the firm's knowledge. Founding team knowledge is specified into the breadth and depth of education, industry experience, and entrepreneurial experience. The relatedness of founding teams' knowledge is specified on founding teams' education and experience (Smith, Collins & Clark, 2005).

The breadth of founding team education refers to the diversity of formal education. In other words, it is the heterogeneity of the field of education. The depth of the founding team's education refers to the average number of years of the founding team's education. The relatedness of founding team education is the degree to which the area of founding team education is similar to the business type of new ventures. The breadth of the founding team's industry experience refers to the heterogeneity of the founding team's industry experience. The depth of the founding team's industry experience refers to the average number of years of founding team industry experience. The relatedness of the founding team's industry experience refers to the degree to which the area of industry that the founding team previously worked is similar to the business type of the new ventures. The breadth of the founding team's entrepreneurial experience
refers to the number of entrepreneurial experiences in the different industries. The depth of the founding team’s entrepreneurial experience refers to the number of start-up experiences in the same industry.

Based on the definitions of the founding team’s characteristics, this study proposes the hypotheses of the effects of the founding team’s knowledge on firm performance. After that, the moderating effects of the types of opportunities, types of strategies, and combined moderating effects of types of opportunities and types of strategies on the relationships between founding teams’ characteristics and firm performance in new business ventures are proposed.

The Effects of the Breadth of the Founding Team’s Knowledge on Firm Performance

The background characteristics include a founder's experience and education, directly affecting new venture performance (Lee & Tsang, 2001). Entrepreneurial cognition facilitates a unique decision-making and is particularly beneficial to a venture in the initial stages of venture development. This cognition or knowledge structure enables founders to readily navigate through a wide array of problems and irregularities inherent in the development of new business ventures (Alvarez & Busenitz, 2001). For example, Bettis and Prahalad (1995) point out that the strategic choices are influenced by dominant logic that makes it difficult for firms to manage strategic change. Gavetti and Levinthal (2000) further argue that cognition seeds and constrains search for new alternatives and opportunities in a manner that makes distant search less likely.

In addition, specific cognitive biases affect managerial decision making. For instance, the availability heuristic (Tversky & Kahneman, 1973), whereby people rely on
information that is easily retrieved, will cause managers to rely on information with which they are most familiar (Prahalad & Bettis, 1986). In addition, Tversky and Kahneman (1974) argue that the adjustment and anchoring heuristic, whereby people make estimates by adjusting an initial value, creates a tendency toward unwarranted optimism in the evaluation of the likelihood that a plan will succeed.

Cassar (2006) argues that in a venture, general human capital such as education may provide skills to understand the business environment, deal with stakeholders, make better or more informed decisions, or allow the application of technical knowledge to operational or business functions. Knowledge breadth is necessary to respond to the multiple demands and to coordinate the diverse activities among a firm's founding team members. The increasing complexity of the business environment seems to indicate that education is an essential entrepreneurial quality. The diversity of the founding team's formal education is likely to enhance the capabilities of the founding team to manage the complexity of the business environment. Finally, the capabilities may lead to a positive impact on firm performance.

Generally speaking, a founder's experience consists of three main components: entrepreneurial, industrial and managerial. Entrepreneurial experience refers to the number of previous new venture involvements and the level of the management role played in such ventures (Stuart & Abetti, 1990). Industrial experience refers to experience in the industry which the venture is in. Managerial experience is the total experience in management regardless of the industry. The present study focuses on industry experience and entrepreneurial experience. As Gasse (1982) argued, a founder's experience can influence performance positively or negatively. For example, prior
experience can be a stumbling block when drastic strategic change is called for (Lee & Tsang, 2001). In this vein, Jo and Lee (1996) examined that managerial experience affected performance negatively, whereas industrial experience had a positive influence on overall performance.

Most studies provide a positive relationship between prior experience and venture performance. Stuart and Abetti (1990) reported a positive effect from managerial experience; Van de Ven et al. (1984) and Vesper (1980) both reported positive effects from industrial experience; Dyke et al. (1992) reported a positive effect from both managerial and industrial experience. Duchesneau and Gartner (1990) used the concept of breadth of managerial experience, which combined managerial and industrial experience, and found that combined experience had a significant effect on venture successes. It seems that the existing evidence generally supports a positive relationship between an entrepreneur's experience and performance. As a consequence, the breadth of the founding team's industry experience and entrepreneurial experience is likely to positively influence the firm's performance.

In addition, Lee and Tsang (2001) argue that the source of knowledge is illustrated by the case of someone who has already been an entrepreneur creating, building, and harvesting a business, and who now sets out to start another business. The entrepreneur who has previous start-up experience would understand what steps to take in order to maximize the new venture's potential (Westhead, Ucbasaran, & Wright 2005). The entrepreneurs would also understand what pitfalls may lie ahead, and thus, what steps not to take (Brush, Greene, & Hart 2001). Thus, the broader the start-up experience, the better the understanding of the significant organizational problems associated with the
staged development and growth of the new ventures (Kazanjian 1988), as well as more pragmatic issues such as negotiating space leases with realtors or lines of credits with banks.

Based on the discussion above, this study proposes the following hypotheses:

_Hypothesis 1.1:_ The breadth of founding teams' education will be positively related to firm performance in new business ventures.

_Hypothesis 1.2:_ The breadth of founding teams' industry experience will be positively related to firm performance in new business ventures.

_Hypothesis 1.3:_ The breadth of founding teams' entrepreneurial experience will be positively related to firm performance in new business ventures.

### The Effects of Knowledge Depth of Founding Team on Firm Performance

Prahalad and Bettis (1986) note that due to cognitive factors associated with a dominant logic, effective management requires constraints on the amount of strategic variety. Knowledge is likely to provide the capability to manage the varieties. Scholars have provided evidence that the founders' years of education and work experience have a positive impact on growth. Cooper et al. (1994), for example, found that high-growth firms are more frequently created by more educated individuals. Sapienza and Grimm (1998) argue that a founder's general level of education is positively related to performance. Bruderl and Preisendorfer (2000) find that the firm's growth is positively related to years of formal education of the firm's founders.

Although a positive relationship between the depth of founder education and firm performance has been found, evidence concerning the effect of education on venture
performance is inconclusive. For example, Dyke et al. (1992) found both positive and negative relationships between the level of education of the business owner and the performance variables. Stuart and Abetti (1990) also found that education level was negatively related to the performance of technical firms. Tan and Tay (1994) found that the education level of the owner was also negatively correlated with sales growth.

Despite the contradictory findings, this research posits that, in general, deeper education has a positive impact on the firm’s performance because education equips an individual with analytical and technical skills that are essential to managing a business. Consequently, the depth of founding team education enforces better and more efficient information process mechanisms with analytical and technical skills.

Experience with deeper knowledge domains is likely to make the search process more predictable and more efficient. These arguments suggest that knowledge depth facilitates the exchange and combination of the existing knowledge (Nonaka, Takeuchi, & Umemoto, 1996) and encourages exploitation of what is already known. For example, Eisenhardt and Schoonhoven (1990) argue that the standard deviation of the years of industry-specific experience of the founders is positively related to the firm’s growth. Colombo and Grilli (2005) argue that the founders’ years of prior work experience in the same industry of the new firm are more positively associated with NTBFs’ growth than the founders’ years of prior work experience in other industries. Finally, the deeper the founding team’s industry experience, the more efficient to facilitate new knowledge and to encourage exploitation of existing knowledge.

In the same vein, Stuart and Abetti (1990) find a strong positive correlation between firms’ performance and the entrepreneurial experiences of founders. Roure and
Maidique (1986) consider the degree of team completeness, defined as the number of essential functions in a new company that are filled by founders at start-up time; they show that successful companies have more complete founding teams. Thus, the depth of founding team entrepreneurial experience may be positively associated with firm performance, because they may have developed efficient cognitive mechanism on managerial and market information.

As a result, this research proposes the following hypotheses on the impacts of the depth of the founding team education, industry experience, and entrepreneurial experience on firm performance in new business ventures:

*Hypothesis 2.1:* The depth of founding teams' education will be positively related to firm performance in new business ventures.

*Hypothesis 2.2:* The depth of founding teams' industry experience will be positively related to firm performance in new business ventures.

*Hypothesis 2.3:* The depth of founding teams' entrepreneurial experience will be positively related to firm performance in new business ventures.

The Effects of the Knowledge Relatedness of Founding Team on Firm Performance

Knowledge relatedness helps a founding team to understand the new business and increases its ability to acquire new knowledge required to turn the business opportunity into a successful firm (Haynie, Shepherd, & McMullen, 2009). However, a high level of knowledge relatedness means that the founding team has deep and narrow knowledge, hampering its ability to think outside of the box and come up with many innovative solutions (Sapienza, Parhankangas, & Autio, 2004). Thus, there may be an inverted U-
shaped relationship between founding teams' knowledge relatedness and firm performance.

Related knowledge enhances the ability of the firm to evaluate effectively the value of external knowledge, to discard irrelevant knowledge, and to concentrate its learning efforts on valuable knowledge sources (Grant, 1996). The literature on knowledge relatedness argues that the construct is important because it influences the individual's perceptions of feasibility (Krueger, 1993). This suggests that the potential entrepreneurial founding team is unlikely to view the opportunity exploitation as feasible if the knowledge required is vastly different from the knowledge held. Thus, anticipated is a close relationship between the degree of knowledge relatedness regarding the opportunity at hand and the propensity to engage in entrepreneurial activity.

Firms learn most efficiently close to their existing knowledge domains (Sapienza, Parhankangas, & Autio, 2004). Information filters are needed to deal with the inflow of information in new business ventures for identifying valuable knowledge and rejecting irrelevant knowledge (Henderson & Clark, 1990). Such filters can be built through existing operations and processes. Related knowledge is associated with the efficiency of communicating external knowledge and assimilating it into the existing knowledge (Grant, 1996). In addition, closely related knowledge stirs up the organization's established beliefs about relationships between the firm's activities and the outcomes of those actions, thereby enhancing its acceptance within the receiving organization domains (Sapienza, Parhankangas, & Autio, 2004).

Assuming an individual intends to establish a venture, the relatedness of knowledge is likely to be critical for the individual's decision making to growth,
including production, technology, and marketing (Rumelt, 1974). When an individual decides to be an entrepreneur, the entrepreneur must make assumptions about the new market, customers, and suppliers, but previous experience with customers, suppliers, and competitors should improve the quality of decisions. If not available to combine the prior experience, he or she is likely to use his or her own knowledge through formal education because such knowledge at least provides familiarity with new information. For example, familiarity with a similar kind of strategic approach and internal organization may improve the quality of decisions. Therefore, the type of knowledge that is required for the new venture is highly associated with the previous experience and education of the founders, leading to a higher probability of survival. Furthermore, where the founders bring knowledge to their firms that is unrelated to that necessary for the ventures, there may be a higher risk of failure.

Wiklund and Shepherd (2003) delineate procedural knowledge in new business ventures as arising from experience with similar past situations. Capron, Dussauge, and Mitchell (1998) argue how firm performance responds favorably when related managerial capabilities developed in other companies are brought to bear in new situations. Tanriverdi and Venkatraman (2005) also highlight that the simultaneous application of product, customer and managerial knowledge relatedness across different business units improves the market performance of multi-business companies. Therefore, high levels of knowledge relatedness of founding teams can benefit in starting up and operating new business ventures (Wiklund & Shepherd 2003). Colombo and Grilli (2005) point out that NTBFs will exhibit higher growth with more heterogeneous educational background and prior work experiences of their founders.
However, researchers also note the negative effects of knowledge relatedness when the founding team members have too much related knowledge with one another. As the amount of related knowledge increases and unrelated knowledge diminishes, the potential for new knowledge creation will be diminished (Tanriverdi & Venkatraman, 2005). In this vein, as the relatedness of founding team members' knowledge increases, the founding team members are unlikely to absorb unrelated knowledge. When the founding team members' knowledge is too related, the team may come up with limited alternatives in decision making and the decision making process may be routinized. As a result, too much related knowledge of founding team members is likely to hamper firm performance in new business ventures.

This research suggests a curvilinear relationship between the relatedness of founding teams' knowledge and firm performance (Palich, Cardinal, & Miller, 2000). In short, up to some point, increases in knowledge overlap raise the productive capacity of new ventures, thereby enhancing its potential for growth. Minimal knowledge relatedness hampers learning because assimilation of knowledge suffers. Extreme knowledge relatedness hampers learning because the potential for novel knowledge combinations is reduced. As a result, the knowledge relatedness of education and industry experience is likely to have a curvilinear relationship with firm performance.

Finally, this study proposes the following hypotheses of the relationships between the relatedness of founding teams' education and industry experience and firm performance:

_Hypothesis 3.1: The relatedness of founding teams' education will have an inverted U-shaped relationship with firm performance in new business ventures._
Hypothesis 3.2: The relatedness of founding teams’ industry experience will have an inverted U-shaped relationship with firm performance in new business ventures.

Moderating Effects of Types of Opportunities and Types of Strategies

Business opportunity and strategy are critical for a new venture’s survival and growth. Therefore, this research invites both types of opportunities and types of strategies as moderators. Specifically, novelty-centered and efficiency centered opportunities are employed for Hypotheses 4.1, 4.2, 4.3, 4.4, and 4.5 and 5.1, 5.2, 5.3, 5.4, and 5.5. Differentiation and low cost strategies are employed for Hypotheses 6.1, 6.2, 6.3, 6.4, and 6.5 and 7.1, 7.2, 7.3, 7.4, and 7.5. Finally, the last hypotheses are proposed for the combined moderating effects.

Moderating Effects of Types of Opportunities

Founding team members differ in their life experiences, work history, and education, Therefore, they each hold a unique stock of knowledge. The variations in experience explain why founders differently identify opportunity in new ventures. In addition, opportunities abound for firms to reduce environmental resource pressures and, moreover, to do so in a profitable manner (Hawken, 1993). Opportunities will commonly be recognized by combining scattered information of a market in more efficient ways.

The entrepreneurial founding team can be viewed as a reflexive agent engaging in purposeful action. Sources of opportunities are extant features that provide the context for creating new business ventures. The founders specify, interpret, and act upon the sources
of opportunity. This is a dynamic process whereby the sources of opportunity are acted on by the founders, and the founders are affected by the sources of opportunity (Sarason, Dean, and Dillard, 2006).

Sarason, Dean, and Dillard (2006) argue that entrepreneurs both create and are created by the process of entrepreneurship and therefore can be constructively viewed as a duality. Furthermore, they indicate that the mechanism of this co-creation involves the recursive interaction of entrepreneur and opportunity over time and can be most accurately characterized as a continuously evolving cycle of entrepreneur and opportunity inter-dependence. The evolving cycle of the entrepreneurial process operates through the knowledgeable and reflexive actions of the founders.

Founding team and opportunity co-evolve along a time-space continuum as founding team interpret their world and act on these interpretations. Co-evolution occurs as the founding team’s actions alter opportunities and as these changed opportunities are open to re-interpretation. Moreover, the founding team actions result in both intended and unintended consequences. These consequences are often embodied in new opportunities. In other words, founding team create new opportunities through a co-evolutionary process of actions and consequences that are inherently dependent upon the conceptualization of the founding team, since that conceptualization can generate consequential action. Therefore, applied to the nexus of opportunity and founding team, new business ventures are not only the result of conceptualization by founding team but are also created by them through a reflexive, recursive process.

In sum, an entrepreneurial founding team creates and decides on their opportunities based on their knowledge. The opportunities result in either intended or
unintended outcomes. Then, the opportunities are concerned with the future competitiveness and performance in new business ventures. In this vein, this research expects that the types of opportunities that the founding team applies are likely to have moderating effects on firm performance.

In consequence, novelty-centered opportunities and efficiency-centered opportunities, in this research, are employed to examine the moderating effects between the characteristics of founding teams and firm performance in new business ventures.

**Novelty-Centered Opportunity**

Novelty-centered business opportunities are associated with development and introduction of products and services conducting new ways. A novel business opportunity creates a new way that is not introduced in existing markets. Thus, novelty-centered opportunities imply a qualitative change. In other words, such opportunities are creative, innovative, and risk-taking activities. The emergence of novelty cannot be from mechanistic, computational, and representational means. Rather, it must allow for dynamic behavior (Pettigrew, Woodman, & Cameron, 2001).

Heterogeneity in terms of resource endowments has a profound impact on the success of new ventures (Bamford et al., 2000). Transactive memory systems enable founding teams to assimilate information, assign tasks, and coordinate more efficiently and effectively than teams without these cognitive structures (Zheng, 2012). In addition, prior shared experience among founders is considered as a key entrepreneurial resource for new ventures with limited financial and organizational resources (Eisenhardt & Schoonhoven, 1990; Kor, 2003). Heterogeneous knowledge brings advantages to new business ventures. Therefore, founding teams with broader prior education and
experience in the different areas are likely to be associated with innovative decision activities. Innovative activity can explain a new venture’s founding and initial success.

In the previous section, this study expected that the breadth of founding team education and experience will be positively associated with firm performance. Knowledge breadth responds to the multiple demands and to coordinate the diverse activities in a firm of founding team members. Broader knowledge may be essential for entrepreneurial quality. The diversity of founding team knowledge is likely to improve the capabilities of the founding team to manage the complexity of the business environment. Diverse knowledge of the founding team encourages creativity and innovativeness. Finally, novelty-centered business opportunities are likely to enforce the founding team with broader knowledge to be more influential on firm performance. In other words, superior performance results when the breadth of founding teams’ education and experience fit with novelty-centered opportunities. As a result, this research proposes hypotheses of the moderating effects of novelty-centered opportunities between the breadth of founding team education and experience and firm performance.

In addition, this study argues that the breadth of founding teams’ entrepreneurial experience will be positively associated with firm performance. Founding teams’ entrepreneurial experience helps new ventures to be efficiently set-up. Entrepreneurs with such experience well manage the founding process and post-foundation activities. However, the effects of founding teams’ broader start-up experience may be limited by novelty-centered opportunities, because these opportunities are not fit with the founding team characteristics. Therefore, the positive effect of the breadth of founding team entrepreneurial experience may be decreased at one point. In hence, this study proposes a
curvilinear moderating effect of novelty-centered opportunities between the breadth of founding team entrepreneurial experience and firm performance.

The knowledge-based view suggests there is an inverted U-shaped relationship between the relatedness of founding team knowledge and firm performance. Specifically, up to some point, increases in knowledge overlap raise the productive capacity of new ventures. Minimal knowledge relatedness hampers learning because assimilation of knowledge suffers. Extreme knowledge relatedness hampers learning because the potential for novel knowledge combinations is reduced. In consequence, this research expects that novelty-centered business opportunities moderate the above relationships between the relatedness of founding team knowledge and firm performance.

Hypothesis 4.1: Novelty-centered opportunities will positively moderate the relationship between the breadth of founding teams’ education and firm performance in new business ventures.

Hypothesis 4.2: Novelty-centered opportunities will positively moderate the relationship between the breadth of founding teams’ industry experience and firm performance in new business ventures.

Hypothesis 4.3: Novelty-centered opportunities will positively moderate the relationship between the breadth of founding teams’ entrepreneurial experience and firm performance in new business ventures.

Hypothesis 4.4: Novelty-centered opportunities will positively moderate the inverted U-shaped relationship between the relatedness of founding teams’ education and firm performance in new business ventures.
Hypothesis 4.5: Novelty-centered opportunities will positively moderate the inverted U-shaped relationship between the relatedness of founding teams' industry experience and firm performance in new business ventures.

Efficiency-Centered Opportunity

Efficiency-centered business opportunities are associated with reducing costs in business activities, resulting in performance increases. Founding team can create new designs and reproduce and copy existing ones (Aldrich 1999). Imitation-based approaches toward business creation are often related to an emphasis on lower costs, such as increased efficiency (Zott 2003). In general, efficiency is largely related with deeper knowledge of the founding team. Such knowledge is developed by higher education and repeated experience in similar knowledge domains.

Experience with similar or related knowledge domains makes the search process more familiar and more efficient. In other words, knowledge similarities facilitate the exchange and combination of existing knowledge (Nonaka, Takeuchi, & Umemoto, 1996). As discussed above, the depth of founding team knowledge is closely related with efficiency. The relatedness of founding team knowledge is at the same context of the depth of founding team knowledge. Finally, efficiency centered business opportunities encourage founding teams with deeper and more related knowledge on their business to maximize the efficiency of decision making. The opportunities will positively moderate between the depth and relatedness of founding team knowledge and firm performance.

As a result, this research proposes the following hypotheses:
Hypothesis 5.1: Efficiency-centered opportunities will positively moderate the relationship between the depth of founding teams' education and firm performance in new business ventures.

Hypothesis 5.2: Efficiency-centered opportunities will positively moderate the relationship between the depth of founding teams' industry experience and firm performance in new business ventures.

Hypothesis 5.3: Efficiency-centered opportunities will positively moderate the relationship between the depth of founding teams' entrepreneurial experience and firm performance in new business ventures.

Hypothesis 5.4: Efficiency-centered opportunities will positively moderate the inverted U-shaped relationship between the relatedness of founding teams' education and firm performance in new business ventures.

Hypothesis 5.5: Efficiency-centered opportunities will positively moderate the inverted U-shaped relationship between the relatedness of founding teams' industry experience and firm performance in new business ventures.

**Moderating Effects of Types of Strategies**

**Differentiation Strategy**

A differentiation strategy involves differentiating a product or service or creating something that is perceived as unique industry-wide. Differentiation strategies are designed to create and market innovative, high quality products and services industry-wide (Porter, 1985). According to Porter (1985), successful differentiators rely on strong marketing abilities, creative flair, product engineering skills, and effective coordination across functional areas, whereas low-cost leaders emphasize tight cost controls, process
engineering skills, efficient distribution systems, and structured sets of organizational responsibilities. These distinctions represent that firms seeking to renew or strengthen themselves by being more entrepreneurial should adopt differentiation-type strategies rather than cost leadership strategies.

A venture that adopts a differentiation strategy will attempt to distinguish the perceptions that customers have for its product from the perceptions that they have for the competitors. The venture needs to understand the needs of its customers and of its market in a comprehensive fashion (Bloodgood, Sppienza, & Almeida, 1996). According to Ghoshal (1987), the organizational capacities that generate its competitive advantages in the domestic arena are different from those that create competitive advantages in international markets.

The implementation of a differentiation strategy requires the joint efforts of managers from different functions in order to create a unique position along dimensions which are widely valued by the customer (Porter, 1980). Thus, founding team members may share their knowledge and cooperate with one another to achieve better performance. Here, the basic assumption is that the founding team has diverse knowledge from previous sources of knowledge such as education and experience.

The issue of strategy implementation in a firm is related to fit with managerial characteristics (Litschert & Ramaswamy, 1991). Therefore, the impacts of founding team characteristics on firm performance are likely to be influenced by types of strategies in new business ventures. Diverse founding team characteristics are associated with creative and innovative decision making. Thus, the breadth of founding team knowledge may fit with differentiation strategies. The breadth of founding team education and industry
experience responds to the multiple demands and to coordinate the diverse activities among the firm's founding team members. As a result, differentiation strategies are likely to encourage the impact of the breadth of founding team education and industry experience on firm performance.

Differentiation strategies, like the discussion of novelty-centered opportunities, may enforce a curvilinear relationship between the breadth of founding team entrepreneurial experience and firm performance, because broader entrepreneurial experience of the founding team routinizes the business process and decision-making activities.

As the knowledge-based view suggests that there is an inverted U-shaped relationship between the relatedness of founding team knowledge and firm performance, the curvilinear relationship between the relatedness of founding team knowledge and firm performance may be enforced by differentiation strategies in new business ventures. In consequence, this study proposes the following hypotheses:

Hypothesis 6.1: Differentiation strategy will positively moderate the relationship between the breadth of founding teams' education and firm performance in new business ventures.

Hypothesis 6.2: Differentiation strategy will positively moderate the relationship between the breadth of founding teams' industry experience and firm performance in new business ventures.

Hypothesis 6.3: Differentiation strategy will positively moderate the relationship between the breadth of founding teams' entrepreneurial experience and firm performance in new business ventures.
Hypothesis 6.4: Differentiation strategy will positively moderate the inverted U-shaped relationship between the relatedness of founding teams’ education and firm performance in new business ventures.

Hypothesis 6.5: Differentiation strategy will positively moderate the inverted U-shaped relationship between the relatedness of founding teams’ industry experience and firm performance in new business ventures.

Low-Cost Strategy

A low-cost leadership strategy is characterized by the construction of efficient facilities, the pursuit of cost reductions, control over overhead, and minimization in areas such as R&D, service, and advertising. The low-cost leadership strategy involves the construction of efficient-scale facilities, the aggressive pursuit of cost reduction and cost minimization in all functions of an organization, and offering products to price-sensitive customers (Dess & Davis, 1984).

Zahra and Covin (1993) suggest that low-cost leadership strategies would not be positively related to new product development because new products tend to be the domain of differentiators. Rather, low-cost leadership strategy is usually associated with improvements to existing product lines (Porter, 1980; Dess & Davis, 1984). On the other hand, efficiency and productivity issues are achieved through process improvements that are typically incremental and induced by a structural approach implemented by top management in a top-down fashion (Burgelman, 1984).

For implementing a low-cost leadership strategy, control mechanisms and instruments like budget control can be used in order to achieve low costs. These hierarchical control instruments make consensus less important in the case of a low-cost
leadership strategy. The use of hierarchical control elements may reduce the importance of consensus in the case of a low-cost leadership strategy. Moreover, given the lower level of conflict between different functional departments in firms with low cost strategies (Ruekert & Walker, 1987), achieving consensus becomes less important.

In general, low-cost leadership strategy is largely related with deeper knowledge of founding teams. Such knowledge is developed by higher education and repeated experience in similar knowledge domains. Low-cost leadership strategies are likely to fit with the depth and relatedness of founding team knowledge. The deeper of founding teams’ knowledge, the better control to reduce costs in new business venture. Therefore, low-cost leadership strategies may moderate the relationships between the depth and relatedness of founding team knowledge and firm performance. Thus, the following hypotheses are presented:

Hypothesis 7.1: Low cost strategy will positively moderate the relationship between the depth of founding teams' education and firm performance in new business ventures.

Hypothesis 7.2: Low cost strategy will positively moderate the relationship between the depth of founding teams' industry experience and firm performance in new business ventures.

Hypothesis 7.3: Low cost strategy will positively moderate the relationship between the depth of founding teams' entrepreneurial experience and firm performance in new business ventures.
Hypothesis 7.4: Low-cost leadership strategy will positively moderate the inverted U-shaped relationship between the relatedness of founding teams' education and firm performance in new business ventures.

Hypothesis 7.5: Low-cost leadership strategy will positively moderate the inverted U-shaped relationship between the relatedness of founding teams' industry experience and firm performance in new business ventures.

Combined Moderating Effects of Types of Opportunities and Types of Strategies

In this section, this study combines all variables that are proposed above. Especially, the combined moderating effects of both the types of opportunities and the types of strategies between founding team characteristics and firm performance are presented.

As discussed above, novelty-centered business opportunities are similar to differentiation strategy. These two dimensions are related to creative and innovative business activities. Therefore, the relationship between the breadth of founding team characteristics and firm performance are largely enforced by both moderators: types of opportunities and types of strategies.

On the other hand, efficiency-centered opportunities and low cost strategies can be in the same dimension. These variables are related with routinization of business processes and decreasing costs in new business ventures. Finally, the relationship between the depth of founding team characteristics and firm performance may be magnified by both efficiency-centered business opportunities and low cost strategies. As a result, this research proposes the following hypotheses:
Hypothesis 8.1: The effect of novelty-centered opportunity on the relationship between the breadth of founding teams' education and firm performance will be greater, when firms implement differentiation strategy in new business ventures.

Hypothesis 8.2: The effect of novelty-centered opportunity on the relationship between the breadth of founding teams' industry experience and firm performance will be greater, when firms implement differentiation strategy in new business ventures.

Hypothesis 8.3: The effect of efficiency-centered opportunity on the relationship between the depth of founding teams' education and firm performance will be greater, when firms implement low-cost leadership strategy in new business ventures.

Hypothesis 8.4: The effect of efficiency-centered opportunity on the relationship between the depth of founding teams' industry experience and firm performance will be greater, when firms implement low-cost leadership strategy in new business ventures.

Figure 2.2 is the summary of this research. In the main effects of the first two hypotheses, I expect that the knowledge breadth and depth of founding team education and industry experience will be positively related to firm performance. In addition, the knowledge relatedness of founding teams' education and industry experience will be positively associated with firm performance. Considering moderating effects of types of opportunities and types of strategies, the main effects will be more enforced by such moderators. Finally, combined effects of all variables are presented in the final hypotheses. Specifically, the relationship between the breadth of founding team education
and industry experience and firm performance will be positively moderated by novelty-centered opportunities and differentiation strategies, while the relationship between the depth of founding team education and industry experience and firm performance will be positively moderated by efficiency-centered opportunities and low cost strategies.
Characteristics of Founding Team

Breadth
- Education
- Industry Experience
- Start-up Experience

Depth
- Education
- Industry Experience
- Start-up Experience

Relatedness
- Education
- Industry Experience

* H8.1,2,3,4: Combined moderating effects of types of opportunities and types of strategies

Types of Opportunities
- Novelty-Centered
- Efficiency-Centered

Types of Strategies
- Differentiation
- Low Cost

Figure 2.2 Research Model and Hypotheses
CHAPTER THREE

RESEARCH METHODOLOGY

The objective of this chapter is to describe the sample construction procedure, the operationalization of variables and the analytical methods that will be used to empirically test the hypotheses offered in this dissertation. The first section will provide details of the sample, the data sources and the procedure applied to construct the sample. In the next section, the operationalization of variables and data analysis methods will be discussed.

Sample

This study focuses on the effects of founding team characteristics on firm performance in new business ventures. In addition, this research examines the moderating effects of the types of opportunities and the types of strategies used by founding teams. A sample of new ventures all less than ten years of age at the initial public offering (IPO), therefore, was used to test the hypotheses (Eisenhardt & Schoonhoven, 1990). The firms in this sample did not include spin-offs or subsidiaries (Daily & Dalton, 1993). These criteria ensure that firms in the sample are in the entrepreneurial stage of development, and that they have characteristics as described in the “Characteristics of Pre-IPO Firms” section.

The sample used for this dissertation consisted of firms that went public between the years 2003 and 2008, as this offers the most recent data available for this study. The
use of IPOs over six consecutive years, in the sample, increases the generalizability of this research. Using a sample of firms that went public in different years reduces the biases that arise in a particular year due to idiosyncratic market conditions (Rajagopalan, 1997; Zajac, Krasstz, & Bresser, 2000).

To construct the sample, the list of IPO firms that went public between the years 2003 and 2008 was obtained from Hoover’s Online. The initial list consisted of 976 firms. Of the initial 976 IPO firms, the firms that did not meet the criteria of an entrepreneurial IPO firm (less than ten years of age at the IPO and independently operated) were excluded. Financial firms, such as mutual funds, foreign ADRs, real estate investments trusts, spin-offs of existing public firms, and reversed leveraged buyouts were eliminated because they are often not entrepreneurial firms (Carpenter et al., 2003). In addition, acquired and merged firms were excluded, as these firms are typically not any different from other IPO firms in terms of firm performance and other relevant characteristics (Fisher & Pollock, 2004). Firms that went bankrupt or discontinued during the sample period were also eliminated. Finally, firms with missing data were excluded as well. The final number of eligible firms in the sample was 302.

**Independent Variables**

The purpose of this dissertation is to examine the effects of founding team characteristics of the founding team on firm performance in new business ventures. The independent variables in this research include the breadth of the founding team’s education, industry experience, and entrepreneurial experience, the depth of the founding team’s education, industry experience, and entrepreneurial experience, and the
relatedness of the founding team’s education and industry experience. The following section displays the operationalization of the independent variables.

The Breadth of the Founding Team’s Education

The breadth of the founding team’s education can be referred to as diversity of education background in prior studies (Foo, Wong, & Ong, 2005). This has often been measured in terms of the numbers of formal educational fields represented on the founding team. Seven majors are represented in this study, including, computer science, engineering, science, business, economics, accounting and others (Foo, Wong, & Ong, 2005). The breadth of the founding team’s education was measured with the Herfindahl-Hirschman index (Smith et al., 1994; Wiersema & Bantel, 1992). This index is often used to measure the diversity of categorical variables (Hambrick et al., 1996). The formula is:

\[ H = 1 - \sum p_i^2 \]

where \( H \) represents the diversity measure and \( p \) is the proportion of team members in each category. The higher the \( H \), the greater the diversity of the team’s education. A score of zero means that all team members had the same major. Data on founding team members’ educational background were obtained from prospectuses, proxy statements, and 10-K reports.

The Breadth of the Founding Teams’ Industry Experience

Following Bruderl et al. (1992), Gimeno et al. (1997), and Shane and Stuart (2002), the breadth of the founding team’s industry experience is measured by the number of industries in which the founding team members had worked. The Herfindahl-
Hirschman index was applied to the breadth of the founding team’s industry experience using the total number of unique categories of experience for all founding team members. SIC codes were used to classify the industries in which the founding members had worked (Certo, Covin, Daily, & Dalton, 2001; Kumar, 2005). Nine dichotomous variables were used to distinguish industry categories, which are the following: pharmaceuticals (SIC 2834-2836), computer hardware (SIC 3571-3577), electronics (SIC 3661-3675), instruments (SIC 3826-3845), all other manufacturing (SIC 0111-3999 less preceding manufacturing categories), trade and transportation (SIC 4011-5999), software (7372-7375), physical research (SIC 8731), and all other services (SIC 6011-9999 less preceding service categories) (Nelson, 2003).

The breadth of the founding team’s industry experience is maximized when the founding team members have working experience in different industries. Some founders may have had no prior experience, resulting in a coding of zero for such members. The data on the founding team member’s industry experience was obtained from prospectuses, proxy statements, and 10-K reports.

*The Breadth of the Founding Teams’ Entrepreneurial Experience*

As with the above variables, the breadth of the founding team’s entrepreneurial experience was measured as the Herfindahl-Hirschman index of the total number of unique entrepreneurial experiences among the founding team members. Like industry experience, SIC codes were used to classify the industries of founding members’ prior start-ups (Nelson, 2003). This study measured the breadth of the founding team’s entrepreneurial experience by taking into consideration all the prior entrepreneurial
experiences of the founding team members in different industries (Dimov & Shepherd, 2005). The data for the founding team entrepreneurial experience was obtained from prospectuses, proxy statements, and 10-K reports.

**The Depth of the Founding Teams’ Education**

The depth of founding team member’s education was operationalized in terms of the average number of years of schooling (van der Sluis, van Praag, & Vijverberg, 2004; Wiersema & Bantel, 1992). These scales were coded from one through five individually. The education level was converted to a continuous scale with (1) under diploma, (2) diploma, (3) bachelor, (4) master and (5) doctoral degree (Foo, Wong, & Ong, 2005). The higher the score, the higher the depth of education on the team. The data for the founding team’s education level was obtained from prospectuses, proxy statements, and 10-K reports.

**The Depth of the Founding Teams’ Industry Experience**

Following earlier research (Gomez-Mejia, Balkin, & Welbourne, 1990; Sapienza & Timmons, 1989; Smith, Collins, & Clark, 2005), the founding team's industry experience was measured by using the number of years that the founding team members had worked in the industry of their current venture. To measure the depth of founding team’s industry experience, I matched the SIC code of the previous industry of founding team members with the industry of its current venture. The depth of founding team industry experience was measured as the number of years that founding team members previously worked in the same industry as current industry. The data regarding the depth
of the founding team’s industry experience was obtained from prospectuses, proxy statements, and 10-K reports.

*The Depth of the Founding Team’s Entrepreneurial Experience*

Knowledge of the entrepreneurial process should increase with each time an individual proceeds through the founding of an additional new venture (Wright et al., 1998). This study used the actual number of new ventures started, as additional learning should take place each time an entrepreneur starts a new venture (Zhao et al., 2005). Therefore, the depth of the founding team’s entrepreneurial experience was measured by the number of start-ups that the founding members established in the industry of their current venture (Stuart & Abbeti, 1990). As with the depth of founding team’s industry experience, I matched the SIC code of the previous industry of founding team members and the industry of their current venture. The data of the depth of founding teams’ entrepreneurial experience was obtained from prospectuses, proxy statements, and 10-K reports.

*The Relatedness of the Founding Team’s Education*

Specific forms of education, such as engineering, computer science, and biochemistry, provide recipients of this education an advantage if they start a firm that is related to their area of expertise (Sapienza & Grimm, 1997). The relatedness of the founding team’s education was measured as the degree to which the concentration of the founding team’s formal education was related to the current business. Specifically, this variable was measured by the average number of years the founding members spent
learning their majors related to their ventures. The data of the founding team’s education level was obtained from prospectuses, proxy statements, and 10-K reports.

The Relatedness of the Founding Team’s Industry Experience

The relatedness of the founding team’s industry experience measured the degree of which the experience founding team members had in previous industries was related to current business areas. To measure the relatedness of a founding teams’ industry experience, this research matched the SIC code of the previous industry on founding team members and the industry of current ventures (Haleblian & Finkelstein, 1999; Villalonga & McGahan, 2005). Despite their weaknesses (Markides & Williamson, 1996), the information for the SIC-based relatedness measures is the only information that is consistently available for all ventures in the sample (Keil, Maula, Schildt, & Zahra, 2008). When the first two digits matched between the previous industry and current business of the founding team members, the founding team’s industry experience was classified as related. Otherwise, the founding team’s industry experience was classified as unrelated. The data of the founding team’s industry experience were obtained from COMPUSTAT.

Moderating Variables

This dissertation includes two moderators on the relationship between the founding team’s characteristics and new ventures’ performance: 1) types of opportunities and 2) types of strategies. For the first moderator, novelty-centered and efficiency-centered opportunities were encouraged for this research. Differentiation strategies and low-cost leadership strategies were employed for these types of strategies. Using
prospectuses and proxy statements such as 10-K reports, content analyses were conducted on the moderating variables. Central to the value of content analysis as a research methodology is the recognition of the importance of language in human cognition (Sapir, 1944). Content analysis assumes that groups of words reveal underlying themes and that co-occurrences of keywords can be interpreted as reflecting association between the underlying concepts (Huff, 1990; Weber, 1990). As Morris, Schindehutte, and Allen (2003) argued, content analysis of key words led the authors to identify the general categories of definitions based on their principal emphasis. In its most basic form, word frequency has been considered to be an indicator of cognitive centrality and importance (Abrahamson & Hambrick, 1997; Huff, 1990), as frequent references are interpreted as an indication of values’ importance or centrality (Huff, 1990).

Content analysis advocates have noted several advantages of this type of methods over competing choices (Duriau, Reger, & Pfarrer, 2007). The first advantage is that content analysis provides a replicable methodology to access deep individual or collective structures, such as values, intentions, attitudes, and cognitions (Carley, 1997; Kabanoff, 1996). Second, content analysis provides the analytical flexibility needed (Duriau, Reger, & Pfarrer, 2007). Third, longitudinal research designs can be implemented due to the availability of comparable corporate information over time, such as annual reports (Jauch, Osborn, & Martin, 1980; Kabanoff, 1996; Weber, 1990). Finally, content analysis can be nonintrusive and does not suffer from researcher demand bias (Woodrum, 1984). Content analysis, particularly on long documents, is arduous and ensuring its reliability is difficult (Short & Palmer, 2008). In an effort to increase
confidence in the reliability of the coding process used, I conducted content analysis to then have one of my dissertation chairs verify the correction with sample firms.

Types of Opportunities: Novelty-Centered Opportunities vs. Efficiency-Centered Opportunities

Novelty-centered opportunities involve creative and innovative products and processes (Zott & Amit, 2007). Data used in this study was collected directly from the IPO statement, including Securities and Exchange Commission (SEC) forms S-1 and 10-K, and amongst others (McGee, Dowling, & Megginson, 1995). Scholars indicate that the use of these IPO registration statements is relatively reliable due to reporting requirements, SEC scrutiny, and sanctions against falsification (Marino, Castaldi, & Dollinger, 1989; Mosakowski, 1991). Several key words were applied to identify the novelty-centered opportunities in the sample firms. A few of key words included: novel, creative, innovative, new, patents, and copyrights (Gatignon et al., 2002; Gatignon, 2003). For example, when the reports mentioned the words “innovative”, “creative”, or “new” for products, services, or business processes, the presence of the novelty-centered opportunities was coded 1. If these words were not present, it was coded as 0.

Efficiency-centered opportunities involve the improvement and efficiency of products or processes (Aldrich, 1999; Zott, 2003). Similar to the operationalization of novelty-centered opportunities, content analysis was used to identify efficiency-centered opportunities. This study used key words such as: efficient, costs, low errors, imitation, improved process, reducing asymmetry, and transparent transactions (Gatignon et al., 2002; Gatignon, 2003). The presence of efficiency-centered opportunities was measured
as a dummy variable coded one if the sample firm’s reports contained such key words, and zero otherwise.

*Types of Strategies - Differentiation Strategies vs. Low Cost Strategies*

Michael Porter’s typology of generic business strategies (differentiation, low-cost leadership) were examined based on data in the IPO prospectuses (Shrader & Siegel, 2007). According to Porter (1980), differentiation strategy is associated with creative flair, strong basic research, and product engineering. In order to derive strategic choices, prospectuses were evaluated and strategy was coded using uniform, pretested coding sheets (Amason et al., 2006; Kunkel, 1991; McGee & Dowling, 1994; Robinson, 1995; Shrader, 1996; Shrader, Oviatt, & McDougall, 2000). The firm’s differentiation strategy was associated with these key words, such as differentiation, different ways, different methods, innovative, innovativeness, different products and services, improving and developing new products and services, creative, and creativeness. Thus, when a sample firm’s report contained such key words, a dummy variable of one was coded, and zero was coded otherwise.

Low cost leadership strategy is concerned with the reduction of costs in new ventures (Porter, 1980). The key words to identify this strategy included low prices of products or services, improved technologies or processes, low costs, and efficiency (Carter, Stearns, Reynolds, & Miller, 1994). When the reports mentioned such key words, a dummy variable of one was coded, and zero was coded otherwise.
**Dependent Variable**

The dependent variable is firm performance in this dissertation. Two separate measures of firm performance were applied to this research: accounting and market measures. Sales growth was the accounting measure, while holding period returns was the market measure.

Sales growth and holding period returns were calculated for a period of three years, with one year lag in relation to corresponding independent variables. Consistent with Zajac and colleagues (2000), this research assumes that a one-year lag is sufficient to capture the effects of the founding team’s characteristics on firm performance.

Holding period returns has been applied to examine the effects of various types of variables on firm performance. Jayaraman et al. (2000) used 3-year holding period returns, for example, as a dependent variable to examine the impact of founder management on financial performance. Hamao, Packer, & Ritter (2000) also employed a 3-year holding period return as a performance variable to investigate the relationship between institutional affiliation and the role of venture capital. Silhan and Thomas (1986) applied a 3-year holding period returns to look at the impact of corporate diversification on firm performance.

Sales growth was measured as the ratio of the difference between sales at tn and sales at tn+1 (n=1 or 3) divided by sales at tn (Allison, 1990; Bloodgood et al., 1996; Brush, 1995; Chandler & Hanks, 1993; Mishina, Pollock, & Porac, 2004; Shrader & Segel, 2007; Zahra, Ireland, & Hitt, 2000). The data was obtained from COMPUSTAT.
Holding period returns (HPR) as the market performance measure was calculated as follows:

\[ R_i = \left[ \prod_{t=1}^{36} (1 + \ r_{it}) \right] \]

where \( r_{it} \) is the return of firm \( i \) in month \( t \). This study calculated holding period returns for a period of three years (year \( t2 \) to \( t4 \)). Three-year holding period returns represent the return on an investment in the firm’s stock for a period of three years. Monthly stock return data for this measure was obtained from COMPUSTAT.

**Control Variable**

Variables that had significant effects on a new business venture performance in previous research included industry effects, firm size, firm age, blockholder ownership, corporate governance structure, TMT size, and TMT ownership. As a result, I added a control to compensate for the effects of these variables. The following section discusses these control variables.

**Industry Effects**

Systematic differences can exist between companies in different industries for both the independent and dependent variables. In addition, different industries can be considered profitable in any one year (Ritter, 1984), potentially resulting in systematic pricing differences for IPOs of companies in these profitable industries. For the first SIC code, I coded C1, SC2, SC3, SC4, SC5, SC6, SC7, and SC8 for the first SIC code of the different categories, respectively. Data for this variable was collected from COMPUSTAT.
Firm Size

This study controlled for differences in the size of new ventures by acknowledgement that firms that had better performance in previous years were likely to have a better chance of producing good performance in the upcoming years, versus firms that had poorer prior performance (Carpenter et al., 2003). Larger firms are presumed to be more mature, better known and have a larger, stronger employee staff as compared to smaller firms, therefore requiring different skill sets from CEO candidates that in turn influence decisions for the founding team (Wasserman, 2003). Consistent with the IPO literature, firm size was measured as the log of the firm’s total assets.

Firm Age

Also consistent with prior studies, firm age was measured as the number of years from the date of incorporation to the IPO (Davilla et al., 2003). It has long been argued that younger firms suffer from the liability of newness which creates difficulties in accessing resources for survival and growth (Chaganti et al., 1995). Younger firms are subject to greater likelihood of failure for a variety of reasons (Hannan & Freeman, 1984; Stinchcombe, 1965). Researchers, however, have argued that the disruptive effects of organizational change are most severe among older firms (Amburgey et al., 1993), as older firms are better developed and have greater inertia. Such inertia has the potential to make the change from private to public status riskier for older firms that go public. Firm age was transformed into a natural logarithm to reduce the effects of extreme values on the analysis, adding one to all observations before transforming the measure.
Blockholder Ownership

The concentration of shares in the hands of investors can affect the discretion of management (Tosi et al., 1999). Various measures of blockholder ownership have been measured in previous researches, such as the percentage of shares owned by the largest single blockholder and the percentage of shares owned by all blockholders (McConnell & Servaes, 1990). This study measured blockholder ownership as total ownership of shareholders with five percent or greater ownership in the firm. Data for this variable was collected from 10-K reports.

Corporate Governance Structure

The ratio of nonexecutive directors (outside directors) to board size is important (Sanders & Carpenter, 1998). Greater numbers of outsiders on the board are expected to result in greater representation of shareholders’ interests. The number of outside board members is defined as the number of board members who are not current or former employees of the organization, or family members of current or former employees. This definition is consistent with the notion of independent, or unaffiliated, directors (Finkle, 1998). The ratio of the number of outside board members was calculated based on the data from 10-K reports.

TMT Size

Prior research has suggested that TMT size is related to firm performance (Sanders & Carpenter, 1998). Thus, this variable was controlled for the TMT size effect. TMT size refers to all individuals identified as key executives of the corporation in the offering prospectus. In this research, TMT size was measured as the total number of
managers on a company's top management team (Simons, Pelled, & Smith, 1999). The data for TMT size was obtained from the proxy statements.

**TMT Ownership**

Prior research indicates that TMT ownership influences firm decisions. Higher TMT ownership increases TMT's independence from the CEO, and consequently, increase TMT's influence on decisions related to new venture performance (Jain & Tabak, 2008). TMT members with higher ownership can contaminate the founding team effects. TMT ownership is measured as the percentage of stock ownership that top management team members hold (Bharat & Filiz, 2008). The data for TMT ownership was obtained from proxy statements.

**Analytical Method**

I conducted hierarchical moderated regression analysis to test the hypotheses according to standard procedures (Cohen & Cohen, 1983). This study conducted Ordinary least squares (OLS) regressions because the data is cross-sectional and thus does not suffer from an autocorrelation problem. For each dependent variable, three sets of models were used to examine the impact of independent and moderating variables. The first two sets of models consisted of five models. The first model included only control variables. The second model included control variables and main variables. The third set and forth set of the models consisted of control variables, main variables, and moderating variables. Finally, the fifth model included all variables added both moderators at once. The third set of moles consisted of seven models. The first model included only control variables. The second model consisted of control variables and main variables. The third
model included new terms REdu and Rind to test the curvilinear impact of the relatedness of the founding team education and industry experience on firm performance. Finally, the last four models consisted of control variables, variables, and novelty-centered opportunities, efficiency-centered opportunities, differentiation strategies, and low-cost leadership strategies individually.

The change in the amount of variance explained ($R^2$) was computed for each model, especially for moderating effects. I followed the graphing procedure by Aiken & West (1991) to graphically demonstrate the interactive effects.
CHAPTER FOUR

PRESENTATION OF DATA ANALYSIS

This chapter describes the results of empirical analysis. The first section presents the descriptive statistics and a correlation table, including variables used in this dissertation. The second section presents the specification of the various regression models I hypothesized. The final section summarizes the tests of the hypotheses.

Descriptive Statistics and Correlations

I collected a data set to examine the effects of founding teams characteristics and the types of opportunities and the types of strategies on corresponding firm performance over the three years following the IPOs: $t_3, t_0$, where $t_0$ defines IPO between the years 2003 and 2008, and $t_3$ defines the third year after the IPO. Table 4.1 presents the descriptive statistics and correlation matrices of the variables used in this dissertation.

The mean subsequent annual sales growth and the mean subsequent annual holding period returns were 64.69 and -0.11, respectively. The average industry effects of the samples were zero for SC1, 0.07 for SC2, 0.21 for SC3, 0.29 for SC4, 0.12 for SC5, 0.05 for SC6, 0.19 for SC7, and 0.06 for SC8, respectively. The average firm age at the time of their IPO was seven years. The average firm age has varied in previous studies depending on the years in which the IPOs occurred and the selection criteria employed.
Table 4.1

Descriptive Statics & Correlations of Variables

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<td></td>
<td></td>
<td>0.41**</td>
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<td></td>
<td></td>
<td>0.24**</td>
<td>0.20**</td>
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<td></td>
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<td>-0.45**</td>
<td>-0.32**</td>
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<td>-0.19**</td>
<td>-0.26**</td>
<td>0.36**</td>
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</tr>
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<td>22. Start-up Depth</td>
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<td>-0.28**</td>
<td>-0.15**</td>
<td>0.26**</td>
<td>0.14*</td>
</tr>
</tbody>
</table>

† p .10
* p .05
** p .01
For instance, Nelson (2003) reported that firm age was 12 years, while Certo and Colleagues (2001) found the average firm age to be 5.31 years for all U.S. firms that went public between 1990 and 1998. The mean of firm size was 381.14. The average size of a top management team was 6.86 and their average ownership was 25.35 percent. Carpenter et al. (2003) reported that 6.5 was the average size of a top management team and Sanders and Boivie (2004) found that the average top management team ownership was 16 percent. The average blockholder ownership was 9.52 percent. Sanders and Boivie (2004) found that the average blockholder ownership was 16 percent. The average ratio of the outside board members was 0.44 percent. Certo et al. (2001) found that the proportion of outside directors was 0.61, while Carpenter et al. (2003) reported 0.68 instead to be the proportion of outside directors.

The correlation matrices indicated that some independent variables were correlated. In these correlation matrices, SC2 was significantly related to SC3, SC4, SC5, SC7, TMTsize, breadth of founding team education, and depth of education. SC3 was significantly associated with SC4, SC5, SC6, SC7, SC8, TMT size, Blockholder, depth of education, and relatedness of education. SC4 was significantly related to SC5, SC6, SC7, SC8, percentage of outside directors, and depth of industry experience. SC5 was significantly related to SC7, SC8, firm age, TMT size, percentage of outside directors, firm size, breadth of education, breadth of industry experience, depth of education, depth of industry experience, and relatedness of education. SC6 was significantly associated with SC7 and firm age. SC7 was significantly related to SC8, blockholder, TMT ownership, and breadth of education. SC8 was significantly related to firm age, breadth of industry experience, and relatedness of industry experience. Firm age was significantly
associated with TMT size and depth of industry experience. TMT size was significantly related to percentage of outside directors, blockholder, firm size, and depth of education. Percentage of outside directors was significantly related to blockholder. Blockholder was significantly associated with TMT ownership, breadth of industry experience, breadth of start-up experience, depth of education, depth of industry experience, depth of start-up experience, and relatedness of education. TMT ownership was significantly related to depth of start-up experience. Firm size was significantly associated with the breadth of education and the depth of education. The breadth of education was significantly related to the breadth of industry experience, breadth of start-up experience, depth of education, depth of industry experience, depth of start-up experience, relatedness of education, and relatedness of industry experience. The breadth of industry experience was significantly related to the breadth of start-up experience, depth of education, depth of industry experience, relatedness of education, and relatedness of industry experience. The breadth of start-up experience was significantly related to depth of education, depth of industry experience, depth of start-up experience, relatedness of education, and relatedness of industry experience. The depth of education was significantly associated with the depth of industry experience, depth of start-up experience, relatedness of education, and relatedness of industry experience. Depth of industry experience was significantly related to depth of start-up experience, relatedness of education, and relatedness of industry experience. Depth of start-up experience was significantly related to relatedness of industry experience. The relatedness of education was significantly associated with the relatedness of industry experience.
The intercorrelations among variables in the data suggested the possibility of a problem with multicollinearity or lack of orthogonality. Regression models are not affected when multicollinearity is only slightly significant (Chatterjee & Price, 1977).

To check multicollinearity, I calculated the variance inflation factors (VIF) for all independent variables in this study. The average VIF value was 1.587. The VIF statistic for an independent variable indicates the strength of the linear relationship between the variable and the remaining independent variables. If VIF values are less than 10, multicollinearity does not significantly affect the OLS estimates (Chatterjee & Price, 1977).

Since none of the VIF values were greater than 10, the data did not appear to suffer from serious problems with multicollinearity.

Model Specification

To test the hypotheses of this study, two sets of models were developed. The first model set examines the effects of the independent variables on sales growth. In the second model set, holding period return is considered the dependent variable to investigate the effects of the independent variables on holding period return. I plotted standardized residuals against predicted dependent values, and the independent variables of the two models appeared to be fairly randomly distributed around zero. There were not any clear patterns in the distributions of residuals. Outliers for these variables were checked utilizing Boxplots. Boxplots suggested that some variables may have several outliers. There were a number of residuals lying beyond two and -2 standard deviations. Following the procedure suggested by Judge, Hill, Griggeths, Luckepohl, and Lee (1988), I looked at the residual plots and identified no outlier greater than four in these
observations. As a result, all of the outliers were located within the reasonable data range. Since these outliers were not caused by errors in recoding observations or in assembling the apparatus, they should be regarded as relevant data and should not be rejected (Draper & Smith, 1981).

To conduct a regression analysis, it is necessary to check for four assumptions: lack of fit, normality, homoscedasticity, and autocorrelation. Two lack of fit tests were conducted to study and further understand the data through analysis. ANOVA analysis provided the F-test results. The models for both sales growth and holding period return as dependent variables, F-value 6.15 (p>.0001) and 1.55 (p>.0579) respectively, show that the models do not have lack of fit problems.

Durbin-Watson tests indicate that the research models do not have autocorrelation problems in this study. The DW values are 2.039 and 1.615 for the sales growth and holding period return, respectively.

To check the normality of models, I used a Q-Q plot of residuals and Shapiro-Wilk test. The residual points were fairly close to a straight line, meaning the distribution of residuals was fairly normal. The Shapiro-Wilk test results showed that there were no problems of normality for each these variables (p<.0001).

P-P plot and White tests were used to check the homoscedasticity of the residuals. In the P-P plot points of residuals, there were some violations of the strait line assumption. In addition, homoscedasticity test results concluded some violations related to the homogeneous assumption. Through these violations did occur, the hypothesis is still considered acceptable and within the limits for further examination. Typically, problems related to homoscedasticity violations can be attributed to issues of normality
violations for one or more of the variables under scrutiny. Therefore, it is best to assess, and possibly remediate normality violations before addressing the issue of equal variances (Hair et al., 2010; Tabachnick & Fidell, 2007). In practice, this means that nominal alpha levels are minimally distorted even when normality is violated. This is particularly true when sample sizes are sufficiently large. As a result, further analysis is appropriate to conduct with large samples in this research.

**Hypothesis Tests and Results**

This dissertation presents empirical results through hypothesized models: Table 4.2 and 4.3 for the impact of the breadth of founding team knowledge, Table 4.4 and 4.5 for the depth of founding team knowledge, and Table 4.6 and 4.7 for the relatedness of founding team knowledge on sales growth and holding period return respectively. Specifically, Table 4.2 and 4.3 consisted of five models, including control variables, main variables, two moderating variables, and integrated model of the both novelty-centered opportunities and differentiation strategies. Table 4.4 and 4.5 included control variables in the first model, main variables in the second model, efficiency-centered opportunities in the third model, low-cost leadership strategies in the fourth model, and the integrated impact of moderators in the fifth model. Finally, Table 4.6 and 4.7 consisted of control variables in the first model, the relatedness of founding team education and industry experience in the second model, squared model of the relatedness of founding team education and industry experience in the third model, novelty-centered opportunities in the fourth model, efficiency-centered opportunities in the fifth model, differentiation strategies in the sixth model, and low-cost leadership strategies in the seventh model.
All of these models can be used to test the hypotheses of the research since they are statistically significant \( (p<0.1) \). Results of these six sets of models taken together, can be used to determine whether the hypotheses of the research are supported.

_Hypotheses Supporting the Breadth of Founding Team Education, Industry Experience and Start-up Experience_  

There are three hypotheses that predict the impact of the breadth of founding team education, industry experience, and start-up experience on firm performance. Hypothesis 1.1 suggests that the breadth of founding team education is positively associated with firm performance. Hypothesis 1.2 predicts that the breadth of founding team industry experience is positively related to firm performance. Hypothesis 1.3 suggests that the breadth of founding team entrepreneurial experience is positively associated with firm performance.

In Table 4.2, the second model showed a positive and significant relationship between the breadth of founding team education and sales growth \( (b=0.12, p<0.1) \). Otherwise, Table 4.3 indicated a significant and negative relationship between the breadth of founding team education and holding period return \( (p<0.1) \). Therefore, these results provided the evidence to support the prediction of Hypothesis 1.1. In Table 4.3, there was significant and positive evidence of the impact of breadth of founding team industry experience on holding period return \( (b=0.16, p<0.05) \), which support hypothesis 1.2. For Hypothesis 1.3, Table 4.2 and 4.3 didn’t showed significant evidence of the impact of the breadth of founding team start-up experience on both sales growth and holding period return. In summary, Hypothesis 1.1 and Hypothesis 1.2 received support. Hypothesis 1.3 was not supported by these results.
Table 4.2

Results of Regression Analyses Examining the Impact of the Breadth of Founding Team's Knowledge on Sales Growth

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
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<tr>
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<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.03</td>
</tr>
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<td>0.08</td>
<td>0.08</td>
<td>0.09</td>
</tr>
<tr>
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<td>-0.04</td>
<td>-0.04</td>
<td>-0.03</td>
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<td>0.06</td>
<td>0.09</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td>SC5</td>
<td>0.03</td>
<td>0.05</td>
<td>0.04</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td>SC6</td>
<td>0.06</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
<td>0.08</td>
</tr>
<tr>
<td>SC7</td>
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<td>0.12</td>
<td>0.14</td>
<td>0.14</td>
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<td>SC8</td>
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<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
</tr>
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<td>-0.04</td>
<td>-0.04</td>
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<td>0.09</td>
<td>0.09</td>
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<tr>
<td>Percentage of outside directors</td>
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<td>-0.03</td>
<td>-0.02</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>Blockholder Ownership</td>
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<td>0.17*</td>
<td>0.14*</td>
<td>0.14*</td>
<td>0.17**</td>
</tr>
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<td>-0.01</td>
<td>-0.01</td>
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<td>0.46**</td>
<td>0.46**</td>
<td>0.46**</td>
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<td>0.12</td>
<td>0.12</td>
<td>0.24†</td>
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<td>0.05</td>
<td>0.26†</td>
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<tr>
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<td>0.09</td>
<td>0.07</td>
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</tr>
<tr>
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<td>0.28**</td>
<td>0.28**</td>
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</tr>
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</tr>
<tr>
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<td>-0.02</td>
</tr>
<tr>
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<td></td>
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</tr>
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</tr>
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</tr>
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<td></td>
<td></td>
<td></td>
<td>0.04†</td>
</tr>
</tbody>
</table>

| R²       | 0.265 | 0.331 | 0.334 | 0.334 | 0.339 |
| ΔR²      | 0.067 | 0.003 | 0.003 | 0.004 |       |
Table 4.3

Results of Regression Analyses Examining the Impact of the Breadth of Founding Team’s Knowledge on Holding Period Return

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
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<td>SCI</td>
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<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.06</td>
</tr>
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<td>0.25</td>
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</tr>
<tr>
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<td>0.43</td>
<td>0.43</td>
<td>0.46</td>
</tr>
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<td>0.36</td>
<td>0.37</td>
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<td>0.25</td>
<td>0.24</td>
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<tr>
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<td>0.46</td>
<td>0.44</td>
<td>0.44</td>
<td>0.46†</td>
</tr>
<tr>
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<td>0.33†</td>
<td>0.33†</td>
<td>0.33†</td>
<td>0.33†</td>
<td>0.32†</td>
</tr>
<tr>
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<td>-0.04</td>
<td>-0.04</td>
<td>-0.04</td>
<td>-0.04</td>
</tr>
<tr>
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<td>-0.05</td>
<td>-0.05</td>
<td>-0.03</td>
</tr>
<tr>
<td>Percentage of outside directors</td>
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<td>0.02</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
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<td>-0.04</td>
<td>-0.01</td>
</tr>
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<td>0.01</td>
</tr>
<tr>
<td>Firm Size</td>
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<td>0.09</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
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<td>-0.16†</td>
<td>-0.16†</td>
<td>-0.16†</td>
<td>-0.04</td>
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<tr>
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<td>0.19**</td>
<td>0.19**</td>
<td>0.19**</td>
<td>0.39*</td>
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<tr>
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<td>-0.09</td>
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<td>0.15*</td>
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<td>0.06</td>
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<td>Novelty</td>
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<td>-0.08</td>
<td>-0.08</td>
<td>-0.08</td>
<td>-0.04</td>
</tr>
<tr>
<td>Breadth of Edu*Nov</td>
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<tr>
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\[
\begin{array}{c|ccccc}
R^2 & 0.045 & 0.111 & 0.138 & 0.138 & 0.150 \\
\Delta R^2 & 0.066 & 0.027 & 0.027 & 0.012\
\end{array}
\]

† p .10
* p .05
** p .01
Hypothesis 2.1 predicts that the depth of founding team’s education will be positively associated with firm performance. Hypothesis 2.2 proposes that the depth of founding team’s industry experience will be positively related to firm performance. Hypothesis 2.3 states that the depth of founding’s team entrepreneurial experience will be positively associated with firm performance.

Table 4.4 and 4.5 show the results of the regression analyses on the relationships between depth of founding team education, industry experience, and start-up experience and firm performance. In Table 4.4 and 4.5, the depth of founding team’s education was not significant on either sales growth or holding period return. Therefore, Hypothesis 2.1 was not supported. The impact of the depth of founding team’s industry experience on sales growth was significant and negative. Thus, Hypothesis 2.2 was not supported. Hypothesis 2.3, which predicts the impact of the depth of founding team’s start-up experience on firm performance, received support by the result (b=0.16, p<0.05). The relationship between the depth of founding team start-up experience and holding period return was significant and positive.

In summary, Hypotheses 2.1 and 2.2 were not supported. Hypothesis 2.3 was supported by the results.
Table 4.4

*Results of Regression Analyses Examining the Impact of the Depth of Founding Team's Knowledge on Sales Growth*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
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<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
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<td>0.03</td>
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<td>-0.02</td>
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<td>-0.02</td>
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<td>0.14</td>
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<td>0.46**</td>
<td>0.46**</td>
<td>0.46**</td>
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<td>0.28**</td>
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$\dagger p .10$

$^* p .05$

$^{**} p .01$

Table 4.5

Results of Regression Analyses Examining the Impact of the Depth of Founding Team's Knowledge on Holding Period Return

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<th>Model 5</th>
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Table 4.5 (Continued)

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† p .10  
* p .05  
** p .01

**Hypotheses Supporting the Relatedness of Founding Team Education and Industry Experience**

Hypothesis 3.1 predicts that the relatedness of founding team’s education will be an inverted U-shaped relationship with firm performance. Hypothesis 3.2 states that the relatedness of founding team’s industry experience will be an inverted U-shaped relationship with firm performance.

To test curvilinearity, I added the quadratic term REdu and RInd to the base regression models. In both Table 4.6 and 4.7, the impact of the squared relatedness of founding team’s education was not significant. In the third model of Table 4.7, the squared regression coefficient was considerably higher than in the model (ΔR²=0.024). The squared relatedness of founding team’s industry experience was significantly and negatively associated with holding period return (b=-0.07, p<0.05). As a result, the relationship between the relatedness of founding team’s industry experience and firm performance was a curvilinear relationship, supporting Hypothesis 3.2.
Table 4.6

Results of Regression Analyses Examining the Impact of the Relatedness of Founding Team’s Knowledge on Sales Growth

<table>
<thead>
<tr>
<th>Variables</th>
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</tr>
<tr>
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</tr>
<tr>
<td>Percentage of outside directors</td>
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</tr>
<tr>
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<td>0.46**</td>
<td>0.46**</td>
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† p .10  
* p .05  
** p .01

### Table 4.7

**Results of Regression Analyses Examining the Impact of the Relatedness of Founding Team’s Knowledge on Holding Period Return**

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<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
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<th>Model 4</th>
<th>Model 5</th>
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| R²                              | 0.045       | 0.111   | 0.135  | 0.161  | 0.161  | 0.161  |
| ΔR²                             | 0.066       | 0.024   | 0.025  | 0.025  | 0.025  | 0.025  |

For further interpretation, I conducted graphical analysis. Figure 4.1 presents an inverted U-shaped relationship between the relatedness of founding team’s industry experience and holding period return. Therefore, Hypothesis 3.2, predicting an inverted U-shaped relationship between the relatedness of founding team’s industry experience and firm performance, was supported.
Figure 4.1 *Graphical Result of the Relationship Between the Relatedness of Founding Team’s Industry Experience and Holding Period Return*

**Hypotheses Regarding the Moderating Effect of the Types of Opportunities**

I tested Hypotheses 4.1, 4.2, 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4, and 5.5 by adding types of opportunities that reflect the interactions on the relationships between the breadth and the depth of founding team’s education, industry experience and entrepreneurial experience, as well as the relatedness of founding team’s education and industry experience and firm performance. Table 4.2 and Table 4.3 show the results of the interaction impact of novelty-centered opportunities on the relationships between the
breadth of founding team’s education, industry experience, and start-up experience and sales growth and holding period return respectively. The models were significant ($\Delta R^2=0.003, \Delta R^2=0.027$). Table 4.2 shows the no significant moderating impact on such relationships. The third model of Table 4.3 indicated a significant and positive interaction impact of novelty-centered opportunities on the relationship between the breadth of founding team’s education and holding period return ($b=0.19, p<0.01$), supporting Hypothesis 4.1. Hypotheses 4.2 and 4.3 were not supported by the results.

Table 4.4 and Table 4.5 show the interaction impact of efficiency-centered opportunities on the relationship between the depth of founding team’s education, industry experience, and start-up experience and firm performance. The models were significant ($\Delta R^2=0.004, \Delta R^2=0.010$). There was no evidence, however, of the interaction by efficiency-centered opportunities on the impact of depth of founding team’s education, industry experience, and start-up experience on sales growth and holding period return. Therefore, Hypotheses 5.1, 5.2 and 5.3 were not supported by these models.

Table 4.6 and 4.7 show the test results for Hypotheses 4.4, 4.5, 5.4 and 5.5, which predict the moderating effects of the types of opportunities on the relationship between the relatedness of founding team’s education and industry experience and firm performance. The models were significant ($\Delta R^2=0.005, \Delta R^2=0.025$). Table 4.7 shows the significant and negative interaction impact of novelty-centered opportunities on the relationship between the relatedness of founding team’s industry experience and holding period return ($b=-0.22, p<0.01$). As a result, Hypothesis 4.5 was not supported. On the other hand, the significant and positive effect of efficiency-centered opportunities on the relationship between the relatedness of founding team’s industry experience and holding
period return \( (b=0.22, p<0.01) \). Therefore, Hypothesis 5.5 received support. There was no significant interaction impact of the types of opportunities for Hypotheses 4.4 and 5.4.

To further advance interpretations, I plotted these interaction effects for two levels of the types of opportunities: with opportunities and without opportunities (Aiken & West, 1991). For each case, I plotted the relationship between the breadth of founding team’s education and the relatedness of founding team’s industry experience and firm performance. As indicated by Figure 4.2, when novelty-centered opportunities were implemented, the breadth of founding team’s education led to higher holding period return. Accordingly, Hypothesis 4.1 received support. Figure 4.3 showed that the relatedness of founding team’s industry experience led to lower holding period return when novelty-centered opportunities were implemented, which does not support Hypotheses 4.5. Figure 4.4 indicates that the relationship between the relatedness of founding team’s industry experience and holding period return was enhanced by implementing efficiency-centered opportunities. As a result, Hypothesis 5.5 was supported.

Figure 4.2 Interaction Impact of Novelty-Centered Opportunities on the Relationship Between Breadth of Founding Team’s Education and Holding Period Return
I tested Hypotheses 6.1, 6.2, 6.3, 6.4, 6.5 as well as 7.1, 7.2, 7.3, 7.4, and 7.5 by adding types of strategies that reflect the moderating effects of differentiation and low-cost leadership strategies on the relationships between the breadth of founding team’s education, industry experience, and entrepreneurial experience, as well as the relatedness of founding team’s education and industry experience and firm performance.

The fourth model in Table 4.2 and Table 4.3 indicate the test results of the moderating effects by differentiation strategies on the relationships between the breadth
of founding team's education, industry experience, and start-up experience and sales growth and holding period return respectively. Both models were significant ($\Delta R^2=0.003, \Delta R^2=0.027$). Specifically, Table 4.3 shows significant and positive evidence for Hypothesis 6.1, which predicts that the impact of founding team's education on firm performance will be positively enhanced by differentiation strategies. Therefore, Hypothesis 6.1 was supported ($b=0.19$, $p<0.01$). Hypotheses 6.2 and 6.3 were not supported by the results in both Table 4.2 and Table 4.3.

The fourth model in Table 4.4 and Table 4.5 indicates the empirical results of the moderating effects by low-cost leadership strategies on the relationships between the depth of founding team's education, industry experience, and start-up experience and sales growth and holding period return. The models were significant ($\Delta R^2=0.004, \Delta R^2=0.010$). There is no significant evidence of the moderating impact of low-cost leadership strategies, however. As a result, Hypotheses 7.1, 7.2 and 7.3 were not supported.

Table 4.6 and Table 4.7 show the results of the moderating effects by types of strategies on the relationships between the relatedness of founding team's education and industry experience and firm performance. The sixth model in Table 4.6 and Table 4.7 show the interaction impact by differentiation strategies on the relationship between founding team's education and industry experience and sales growth and holding period return ($\Delta R^2=0.005, \Delta R^2=0.025$), respectively. The model of Table 4.6 provides no significant moderating effects from the differentiation strategies on the relationship between the main variables. Table 4.7 shows the significant interaction impact by differentiation strategies on the relationship between the relatedness of founding team's
industry experience and holding period return. The interaction impact of differentiation strategies was negative, however, not supporting Hypothesis 6.5 \((b=-0.22, \ p<0.01)\). The results did not support Hypothesis 6.4 either. As a result, Hypotheses 6.4 and 6.5 were not supported.

Hypotheses 7.1, 7.2 and 7.3 did not receive support by the empirical results. These mean that low-cost leadership strategies do not have interaction impact on the relationships between the depth of founding team’s knowledge and firm performance. Hypothesis 7.5, which predicts the moderating impact of low-cost leadership strategies on the relationship between the relatedness of founding team’s industry experience and firm performance, was supported by the seventh model of Table 4.7 \((b=0.22, \ p<.01)\). Hypothesis 7.4, which states the interaction impact of low-cost leadership strategies on the relationship between the relatedness of founding team’s education and firm performance, was not supported. As a result, the empirical results provide the evidence that low-cost leadership strategies enhance the impact of the relatedness of founding team’s industry experience on firm performance.

The graphing procedure outlined by Aiken and West (1991) was used to visually demonstrate these moderating effects. Figure 4.5 showed that the breadth of founding team education led to higher holding period return when differentiation strategies were implemented, supporting Hypothesis 6.1. Figure 4.6 indicated that the relatedness of founding team industry experience led to lower holding period return when differentiation strategies were implemented, not supporting Hypotheses 6.5. In Figure 4.7, the relatedness of founding team industry experience resulted in higher holding
period return when low-cost leadership strategies were implemented. As a result, Hypothesis 7.5 was supported.

Figure 4.5 *Interaction Impact of Differentiation Strategies on the Relationship Between Breadth of Founding Team's Education and Holding Period Return*

Figure 4.6 *Interaction Impact of Differentiation Strategies on the Relationship Between Relatedness of Founding Team’s Industry Experience and Holding Period Return*

Figure 4.7 *Interaction Impact of Low-Cost Leadership Strategies on the Relationship Between Relatedness of Founding Team’s Industry Experience and Holding Period Return*
Hypotheses Regarding the Integrated Moderating Effects of the Types of Opportunities and Types of Strategies

For Hypotheses 8.1, 8.2, 8.3 and 8.4 predicted the integrated moderating effects on the types of opportunities and types of strategies on the relationships between the breadth of founding team’s education, industry experience and firm performance as well as between the depth of founding team’s education and industry experience and firm performance. Hypothesis 8.1 suggests that the moderating impact of differentiation strategies on the relationship between the breadth of founding team’s education and firm performance will be greater when implementing novelty-centered opportunities. Hypothesis 8.2 predicts that the moderating effect of differentiation strategies on the relationship between the breadth of founding team’s industry experience and firm performance will be greater implementing novelty-centered opportunities. Hypothesis 8.3 states that the effect of low-cost leadership strategies on the relationship between the depth of founding team’s education and firm performance will be greater with implementing efficiency-centered opportunities. Hypothesis 8.4 proposes that the low-cost leadership strategies on the relationship between the depth of founding team’s industry experience and firm performance will be greater with implementing efficiency-centered opportunities.

To examine these hypotheses, I entered three-way interaction term. The addition of this product term significantly increased the variance explained in performance, both sales growth ($R^2=0.004$, $\Delta R^2=0.004$) and holding period return ($R^2=0.012$, $\Delta R^2=0.011$). This suggests that the breadth of founding team’s education and the depth of founding team’s education and industry experience significantly account for firm performance.
Table 4.2 and Table 4.3 show that the relationship between the breadth of founding team education and sales growth is not significantly moderated by both novelty-centered opportunities and differentiation strategies. Hypothesis 8.1, therefore, was not supported. The empirical results in Table 4.2 indicate that there is a significant and positive moderating impact with both novelty-centered opportunities and differentiation strategies on the relationship between the breadth of founding team’s industry experience and sales growth (b=0.04, p<0.1). Therefore, Hypothesis 8.2 received support. For Hypotheses 8.3 and 8.4, Table 4.4 and 4.5 did not provide significant evidences for the three-way interaction impact of both efficiency-centered opportunities and low-cost leadership strategies on the relationships between the depth of founding team’s education and industry experience and firm performance.

To further probe the three-way interaction effect, I also used the graphing procedure outlined by Aiken and West (1991). Figure 4.8 (a) indicates that with implementing novelty-centered opportunities, the impact of the breadth of founding team’s industry experience led to higher sales growth when differentiation strategies were implemented. Figure 4.8 (b) also shows that no differentiation strategy greatly enhanced the relationship between the breadth of founding team industry experience and firm performance, when novelty-centered opportunities were not implemented. In sum, Hypothesis 8.2 received support by the graphical results.
Figure 4.8 Interaction Impact of Differentiation Strategies on the Relationship Between the Breadth of Founding Team’s Industry Experience on Sales Growth (a) with Novelty-Centered Opportunities and (b) without Novelty-Centered Opportunities.

Summary

Hypothesis 1.1 was supported by the results of the second model, which examined the relationship between the breadth of founding team’s education and sales growth. Hypothesis 1.2, which suggested the positive relationship between the breadth of founding team’s industry experience and firm performance, was also supported. Hypothesis 1.3 was not supported by the models that examined the relationships between the breadth of founding team’s start-up experience and firm performance.

Hypothesis 2.1 proposes the positive relationship between the depth of founding team’s education and firm performance. The results did not provide support for
Hypothesis 2.1. For Hypothesis 2.2, which suggests the positive impact of the depth of founding team’s industry experience on firm performance, was significant and negative. Therefore, Hypothesis 2.2 was not supported by the results. The empirical results provided significant and positive evidences for Hypothesis 2.3, which predicts the positive relationship between founding team’s start-up experience and firm performance.

Hypothesis 3.1 predicted an inverted U-shaped relationship between the relatedness of founding team’s education and firm performance. The results did not indicate support for Hypothesis 3.1. Hypothesis 3.2, which predicted an inverted U-shaped relationship between the relatedness of founding team’s industry experience and firm performance, was supported by both the empirical result and graphical result.

The results provided some evidence to support hypotheses on the moderating effects of the types of opportunities and the types of strategies on relationships between founding team’s characteristics and firm performance. The empirical and graphical results provided significant evidence for the moderating effects of the types of opportunities on the relationships between the breadth of founding team’s education and firm performance, as well as between the relatedness of founding team’s industry experience and firm performance. Therefore, Hypotheses 4.1 and 5.5 were supported. Hypotheses 4.2, 4.3, 4.4, 4.5, 5.1, 5.2, 5.3 and 5.4 were not supported.

Hypotheses 6.1, which suggested the moderating effect of differentiation strategies on the relationship between the breadth of founding team’s education and firm performance, was supported. According to the results, low-cost leadership strategies significantly moderated the relationships between the relatedness of founding team’s
industry experience and holding period return, supporting Hypothesis 7.5. Hypotheses 6.2, 6.3, 6.4, 6.5, 7.1, 7.2, 7.3 and 7.4 were not supported.

Hypothesis 8.2, which suggested the integrated moderating effect of both novelty-centered opportunities and differentiation strategies on the relationship between the breadth of founding team’s industry experience and firm performance, received support by both the empirical and graphical results. Hypotheses 8.1, 8.3 and 8.4 were not supported.
CHAPTER FIVE

DISCUSSION, CONTRIBUTIONS AND LIMITATIONS

Research Findings

In this dissertation, I developed hypotheses regarding the relationship between a founding team's characteristics and firm performance. Using cognition theory, human capital theory and knowledge-based view, Hypotheses 1.1, 1.2, and 1.3 predict that the breadth of founding team’s knowledge is related to greater firm performance. Hypotheses 2.1, 2.2, and 2.3 suggest that the depth of founding team’s knowledge is associated with greater firm performance. Hypotheses 3.1 and 3.2 propose that the relatedness of founding team’s knowledge is positively related to firm performance.

This dissertation also hypothesized the moderating effects of the types of opportunities and the types of strategies on the relationships between founding team characteristics and firm performance. Hypotheses 4.1, 4.2, 4.3, 4.4 and 4.5 suggest that the impact of the breadth of founding team’s knowledge and the relatedness of founding team knowledge on firm performance are enhanced by novelty-centered opportunities. Hypotheses 5.1, 5.2, 5.3, 5.4 and 5.5 suggest that efficiency-centered opportunities enhance the relationships between the depth of founding team’s knowledge and firm performance, as well as between the relatedness of founding team’s knowledge and firm performance. Hypothesis 6.1, 6.2, 6.3, 6.4, and 6.5 predict that novelty-centered opportunities moderate the relationships between the breadth of founding team’s
proposes that low-cost leadership strategies enhance the relationships between the depth of founding team’s knowledge and firm performance. Hypotheses 8.1, 8.2, 8.3 and 8.4 stated that the integrated moderating effects of the types of opportunities and the types of strategies on the relationships between the breadth as well as depth of founding team’s knowledge and firm performance.

The first finding in this dissertation is that there are dichotomous results between the breadth of founding team’s education and firm performance in new business ventures. The results indicated that the relationship between the heterogeneity of founding team education and sales growth was statistically significant and positive. In addition, the results provided that there is significant and negative evidence on the relationship between the breadth of founding team’s education and holding period return. These indicate that the broader founding team’s education is, the more likely it is that they will have greater accounting performance and less market performance in new business ventures. Prior research has shown inconclusive findings on the relationship between the heterogeneous education of founding team and firm performance (Amason, Sharader, & Tomson, 2006; Cooper et al., 1994; Ensley & Hmieleski, 2005; Lin & Shih, 2008; Mason, 2002). As a result, this dissertation may provide an explanation on such findings. In addition, the empirical results indicate that the deeper founding team’s industry experience, the stronger the potential is to be negatively related to firm performance. Furthermore, the depth of founding team’s start-up experience is significantly and positively associated with market performance. Therefore, the more founding team start-up experiences in the same industry can lead to greater firm performance.
The second finding, and supported by previous findings, is that the relatedness of founding team’s industry experience is significantly associated with firm performance in new business ventures. Specifically, the results showed that the relationship between the relatedness of founding team’s industry experience and firm performance was an inverted U-shaped relationship. This finding suggests that related industry experience of founding team may maximize firm performance at one point. Passing a certain point, however, may result in weaker firm performance.

The third and major finding in this dissertation is that the types of opportunities and the types of strategies moderate the relationships between the breadth of founding team’s knowledge and firm performance, as well as the relationship between the relatedness of founding team’s knowledge and firm performance. Specifically, the impact of the breadth of founding team’s education on market performance may be greater when novelty-centered opportunities were implemented. Efficiency-centered opportunities positively enhanced the relationship between the relatedness of founding team’s industry experience and market performance. Furthermore, the results show that novelty-centered opportunities negatively moderate the relationship between the relatedness of founding team’s industry experience and holding period return. For the moderating effects of these types of strategies, the empirical results provide statistically significant and positive moderating impact for differentiation strategies on the relationship between the breadth of founding team’s education and market performance. The relationship between the relatedness of founding team’s industry experience and market performance is enhanced by low-cost leadership strategies. The relatedness of founding team’s industry experience leads to lower market performance when differentiation strategies are implemented.
Lastly, this dissertation also sheds light on the integrated moderating effects of novelty centered opportunities and differentiation strategies. As indicated in the results, the relationship between the breadth of founding team’s industry experience and accounting performance is enhanced by differentiation strategies in implementing novelty-centered opportunities. This finding indicates that when novelty-centered opportunities are implemented, the impact of the broader founding team’s industry experience on firm performance can be greater by implementing differentiation strategies.

The following section discusses a number of theoretical and practical implications of the findings in this research.

**Theoretical Implications**

The findings of this research have important implications for literature concerning the characteristics of founding teams and the interaction effects of the types of opportunities and the types of strategies in the context of new business ventures, as well as the role of entrepreneurial founding teams in new business ventures.

This dissertation has argued that there are significant relationships between the characteristics of founding teams and firm performance, as well as contingent roles of the types of opportunities and the types of strategies, therefore making several primary contributions to entrepreneurship literature. First, this dissertation summarizes the previous studies on the effects of founding team characteristics and examines the effects of the specific dimensions of founding team knowledge and experience on firm performance: breadth, depth and relatedness. A large number of studies have examined the relationships between the characteristics of founding teams and firm performance
Most of these studies have focused on heterogeneity of founding team's characteristics, years of founding team's education and professional experience, and the relatedness of founding team's knowledge. Little research has comprehensively examined the impact of founding team knowledge and firm performance, however. This research, specifically, indicates that the breadth of founding team's education is able to lead to greater accounting performance, whereas, the broader founding team's education may lead to less market performance. The depth of founding team's industry experience is likely to be negatively associated with accounting performance. The impact of the depth of founding team's start-up experience on market performance is able to be positive. Therefore, the more founding's team start-up experience is in the same industry, the better the firm performance is.

Second, this dissertation found that there is a curvilinear relationship between the relatedness of founding team's industry experience and firm performance. Prior research has found that the relationship between the related knowledge and firm performance is an inverted U-shaped curve (Palich, Cardinal, & Miller, 2000). Following these findings, this dissertation also shows an inverted U-shaped relationship between the relatedness of industry experience and firm performance.

The third and crucial implication of this study is that it extends the entrepreneurial opportunity and strategy literature. Previous research has mainly investigated the direct effect of the types of opportunities and the types of strategies on firm performance (Bantel & Jackson, 1989; Hambrick, 1982; Eckhardt & Shane, 2003; Litschert &
Ramaswami, 1991; Norburn & Birley, 1988; Pettigrew, 1992; Tihanyi, Johnson, Hoskinsson, & Hitt, 2003; Wiersema & Bantel, 1992; Zott & Amit, 2008). This research found a moderating impact of the types of opportunities and the types of strategies on the relationships between the characteristics of founding team and firm performance. Particularly, the empirical results show that novelty-centered opportunities positively moderate on the relationship between the breadth of founding team’s education and firm performance. The impact of the related industry experience of founding team on firm performance was also enhanced by efficiency-centered opportunities. Differentiation strategies enhance the relationship between the breadth of founding team’s education and firm performance. Finally, there is evidence to show that there is an interaction impact of low-cost leadership strategies on the relationship between the relatedness of founding team’s industry experience and firm performance. In short, the findings of this study imply that it is possible for there to be indirect effects of the appropriate opportunities and strategies, as well as direct impact on firm performance.

The fourth important contribution is that this study sheds light on the integrated moderating effects of the types of opportunities and the types of strategies. The empirical results of this study provide the evidences of the integrated moderating impact of both novelty-centered opportunities and differentiation strategies on the relationship between the breadth of founding team’s education and firm performance. Specifically, in the firms that novelty-centered opportunities are implemented, the broader founding team’s education may lead to higher firm performance with implementing differentiation strategies. These findings indicate that there is likely to be a combined interaction with the types of opportunities and the types of strategies on the relationship between the
characteristics of founding team and firm performance. As a result, research in the entrepreneurial strategy should undertake the indirect impact of the types of opportunities and the types of strategies, as well as the direct effects.

**Managerial Implications**

New business ventures often struggle with liability of newness and smallness (Stinchcombe, 1965). In firms, founding team members play an important role, so they may lay a significant role in competition (Eisenhardt & Schoonhoven, 1990). The findings of this study provide practitioners with valuable insights on how to increase firm performance that have been associated with a variety of factors in new business ventures. First, it is important to consider the characteristics of a founding team when they make decisions for a firm’s survival, and even growth. Based on the findings of this study, the breadth of founding team’s education is negatively associated with market performance and positively related to accounting performance. The relatedness of founding team’s education can contribute to higher market performance. It is important, therefore, that management of new ventures acquires an awareness of relationship between the characteristics of founding team and the different types of performance.

Second, the managerial implication suggested by this study is that the relationship between the relatedness of founding team’s industry experience and firm performance shows an inverted U-shaped relationship. The practitioners need to be aware of such relationships between the relatedness of knowledge in a founding team and firm performance. Specifically, up to a point, increases in the related industry experience of founding team raise the productive capacity of new ventures, therefore enhancing its potential for growth. Minimally related industry experience of founding team hampers
learning because assimilation of knowledge suffers. Extreme related industry experience of founding team hampers firm performance, because the potential for novel knowledge combinations is reduced. As indicated in the empirical results, a founding team with closely related education contributes to firm performance.

Another important implication of this study for management is an analysis of the types of opportunities and the types of strategies that can enhance the relationships between the characteristics of founding team and firm performance. Therefore, management in new business ventures needs to undertake the types of opportunities and the types of strategies that are moderating. As shown in the empirical results, the novelty-centered opportunities negatively moderate the impact of the related industry experience of founding team on firm performance. Efficiency-centered opportunities, otherwise, would positively moderate the relationship between the relatedness of founding team's industry experience. In consideration of strategy types, differentiation strategies negatively moderate the impact of the related industry experience on firm performance, whereas low-cost strategies positively moderate such relationships.

Management should be even more aware of the integrated moderating roles of the types of opportunities and the types of strategies on the relationships between the characteristics of founding team and firm performance. This research provides the empirical evidence for such roles. Three-way interaction results show that differentiation strategies positively moderate the relationship between the breadth of founding team's education and firm performance when novelty-centered opportunities are implemented. On the other hand, the impact of the broader education of founding team on firm
performance is greater without differentiation strategies when novelty-centered opportunities are not implemented.

**Limitations and Future Research**

This dissertation is not without limitations. This study hypothesized that the impact of the characteristics of founding team on performance in new business ventures. Founders are likely to identify their opportunities and to establish their strategies at the outset of their firms. This research used the data at their IPO, however, because there was difficulty in obtaining data at their foundings. Future research, therefore, can use different data collection methods, which can overcome the potential timing bias and more closely, examine the impact of characteristics of founding team in new business ventures at the outset.

The relatedness of founding team’s education is inconsistent with the findings of prior researches. Prior research has found an inverted U-shaped relationship between knowledge and performance (Grant, 1996; Nahapiet & Ghoshal, 1998; Palich, Cardinal, & Miller, 2000). This research, however, found the linear relationship to be between the related education of founding team and firm performance. This research did not explain this gap. Thus, future research can conduct further research to resolve this gap.

This research used novelty-centered opportunities and efficiency-centered opportunities for the types of opportunity variables and differentiation strategies and cost-leadership strategies for the types of strategy variables, to investigate the moderating effects of such variables. There are various types of opportunities and types of strategies that researchers have applied to their previous studies, such as technological and growth opportunities (Baysinger & Hoskisson, 1989; Baysinger, Meiners, & Zeithaml, 1982;
Cohen & Levinthal, 1990; Kelm, Narayanan, & Pinches, 1995; Murphy, Trailer, & Hill, 1996; Sharma & Kesner, 1996; and focused strategies (Porter, 1980, 1985). Future research can apply other types of opportunities and strategies to complement the research in entrepreneurship and strategic management fields further.
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