

ENTREPRENEURIAL CAPACITY AND CULTURE OF INNOVATION
IN THE CONTEXT OF OPPORTUNITY EXPLOITATION

BY

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DISSERTATION

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ABSTRACT

Current research posits that, with the passage of time, organizations tend to lose their ability to innovate. This process takes place as maturing entities become a guardian of the dominant social paradigms. As an integral element of the prevalent “logic of appropriateness,” maturing firms become complacent, make safer choices, and thus slowly become less responsive to external stimuli. This evolution of an organization’s logic may lead to their demise.

The research question of how some firms succeed over time while others fail to do so has long captured the interest of scholars. This dissertation aims to address this question by proposing that a firm can remain successful as long as it correctly understands and capitalizes on the implications of a changing world. The existing literature associates variation in organizational success across firms with heterogeneity of their internal resources. In turn, sustainability of a firm’s competitive advantage is explained as a function of the ongoing evolution of a firm’s heterogeneous capabilities. Building on this theoretical framework, but strongly influenced by the contingency approach, this study aims to expand existing theory by introducing the concept of entrepreneurial capacity. The dissertation proposes that entrepreneurial capacity allows a firm to capitalize on a broad scope of fresh, alternative perspectives that may fundamentally challenge embedded assumptions and path-dependent cognitive schemas that a firm uses. Due to entrepreneurial capacity, a firm becomes exposed to many alternative viewpoints that represent heterogeneity of its external environment. Exposure to a broad array of alternative perspectives prompts a firm to reconsider the effectiveness of its internal operations. As a result, a firm reallocates its internal resources, which leads to improved performance. Given this assumption, the dissertation theorizes and empirically tests the notion that higher heterogeneity among external sources of information coupled with a stronger

cognitive ability to comprehend and capitalize on a broader scope of new heterogeneous information will increase the likelihood of successful opportunity exploitation resulting in superior firm performance. Consequently, this dissertation suggests that a firm will be able to succeed over time, as long as it can maintain its strong entrepreneurial capacity.

In addition to the introduction of the concept of entrepreneurial capacity, the second part of this dissertation focuses on the role of contextual factors during the process of opportunity exploitation. The existing literature indicates that sets of collective values and norms accepted and supported by employees can determine how individuals view the world, how they think, and consequently, how they act. Consistent with this tenant, this study aims to explore the impact of the culture of innovation on the relationship between entrepreneurial capacity and firm performance. The dissertation proposes that when a firm establishes shared cultural norms supporting the process of opportunity exploitation, a firm culture should increase employee motivation to become engaged in behaviors positively reinforcing the effect of entrepreneurial capacity on firm performance.

Empirical tests of the proposed model are based on data collected in the healthcare industry. Research on health care strongly suggests that this very dynamic and complex setting, characterized by a high degree of external volatility provides a valid empirical setting to test the associations between a firm's entrepreneurial capacity, culture of innovation and firm performance. Results of empirical analyses confirm a positive relationship between entrepreneurial capacity and firm performance. Furthermore, results of the study confirm a significant role played by a culture of innovation. Findings and the study's implications for research and practitioners are discussed.

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CHAPTER 1

INTRODUCTION

Introduction

Entrepreneurial actions have long been perceived as a facilitator of societal progress (Schumpeter, 1934). Throughout history, no wars, natural disasters, or bureaucratic regimes have been able to stop people around the globe from coming up with novel ideas and executing them in order to improve the quality of their lives.

Individuals and firms that are perceived as entrepreneurial are held in high societal esteem and are sometimes rewarded with substantial financial profits. An entrepreneurial character, typically associated with new firms, has often been categorized by traits such as risk taking, avoiding the restraints of bureaucracy, and the promotion of novel ways of thinking. It has therefore been long assumed that the entrepreneurial character favorably differentiates new, youthful organizations from older organizations; the latter usually are viewed as more rigid, stagnant, and thereby less opportunistic, and, consequently, less successful.

Because the entrepreneurial spirit became a synonym for business success, the quest for the very elusive *organizational fountain of youth* has become the focal point for many maturing organizations attempting to survive in a challenging and dynamic economy. Thus, for decades, aging organizations have strived to harness and maintain a vigorous entrepreneurial character, perceived by many as an engine for continuous rejuvenation and growth.

New firms are entrepreneurial not only by nature, but also by necessity. Advancing a neophyte mission requires much extra effort; including creative thinking, quick responses to external contingencies, and flexible internal processes adjusted in response to rapidly changing

external needs. All these elements are necessary to develop a competitive edge and establish a place in a competitive market populated by established competitors. Scanning and scrutinizing their environment for new ideas, newcomers are compelled to challenge business paradigms in order to compete for scarcely available resources. In contrast to the more rigid and often complacent established organizations, the more vibrant new organizations continue to redefine a higher model of entrepreneurial character.

The “liability of newness” articulated by Stinchcombe (1965) depicts a tough predicament for new firms. In order to increase their likelihood of survival, such organizations need to focus on activities that challenge the existing institutional order. Consequently, to compete for resources, such as legitimacy, these organizations must introduce new, innovative ideas that propel the process of institutional change (Leblebici, Salancik, Copay & King, 1991; Oliver, 1991; Tolber & Zucker, 1983; Stinchcombe, 1965). However, institutional theory posits that those few successful organizations that manage to overcome the liability of newness will shortly lose their innovative and entrepreneurial character. As they mature, such firms slowly become an integral part of the dominant social structure, or the prevailing “logic of appropriateness” (March & Olsen, 2004; 1996). Consequently, they begin to make safer, more exploitative strategic choices. By doing so, firms can gradually become stagnant, rigid and less responsive to environmental stimuli. This paradigm shift can subsequently lead to their demise (March, 1991; Hannan & Freeman, 1989; 1984).

Regardless of this stereotypical classification of mature organizations as inherently not entrepreneurial, there are, however, examples of established firms that have been able to successfully maintain their longevity by preserving their ability to innovate. This preservation of *an organizational fountain of youth* may have been a key ingredient explaining the ongoing

success of International Business Machines (IBM), which has managed to flourish for over 100 years despite economic, cultural, and technological changes in its business environment.

Although the company had its rocky patches, time after time, IBM has been able to make critical strategic adjustments, reallocate its organizational resources, change its business profile, and successfully adapt to the shifting demands of the evolving markets. At the same time, its competitors, such as Gateway or Compaq, once successful leaders in the computer industry, failed to capitalize on the changes, quickly losing their competitive edge.

What factors could therefore determine why some firms are able to flourish over time, while others lose their entrepreneurial impetus and quickly vanish? In order to provide a clear answer to this intriguing research question, scholars have investigated differences among firms, recognizing heterogeneity of organizational resources as the critical factor (Mahoney & Pandian, 1992; Barney, 1991, Wernerfelt, 1984, Penrose, 1959). Consequently, according to the resource based view, when a firm successfully develops uniqueness of its internal resources, a firm's valuable, rare, and difficult to replicate bundles of resources can become a source of a competitive advantage.

In addition, existing research has provided an answer to the question of *what can be done* in order to maintain an entrepreneurial edge over time, by zooming in on the ongoing evolution of organizational competencies. According to the dynamic capabilities perspective, when continuously updated, evolving organizational competencies allow a firm to effectively adapt to changing external contingencies (Teece, Pisano & Shuen, 1997; Nelson & Winter, 1982). Entrepreneurial theory, on the other hand, links ongoing organizational success to a firm's ability to discover or create new opportunities (Dencker, Gruber & Shah, 2009; Klein, 2008; Alvarez & Barney, 2007; Shane & Venkataraman, 2000).

Taking into account existing research findings, this dissertation seeks to contribute to the debate concerning the sources of a firm's ongoing success. Building on multiple theories, it proposes that a firm can remain successful over time, as long as it correctly comprehends and capitalizes on the broad spectrum of changing external contingencies. As a result, the dissertation introduces the concept of entrepreneurial capacity, which, as it proposes, could represent *the organizational fountain of youth*.

In this study, entrepreneurial capacity is presented as a mechanism that facilitates an ongoing process of opportunity exploitation that results in a sustained competitive advantage. Opportunities are defined as situations in which new products, services, or methods of organizing can be introduced to generate economic profits (Casson, 1982). Such new opportunities can be exploited by a firm, when a firm possesses the ability to understand their economic value, and it initiates the process of internal resource reallocation (Shane & Venkataraman, 2000).

Expanding on the existing theoretical framework, the dissertation proposes that stronger entrepreneurial capacity enables a firm to consider and capitalize on a broader scope of alternative, often competing perspectives that may effectively challenge its embedded assumptions and path-dependent routines. By finding the most effective internal applications for a broad scope of heterogeneous alternatives, entrepreneurial capacity increases the likelihood of opportunity exploitation, thereby leading to superior firm performance. This process can be explained as follows. First of all, strong entrepreneurial capacity enables a firm to access heterogeneous information by creating diverse links between a firm and its external partners who represent disperse parts of a social structure. A higher heterogeneity of external links produces a higher heterogeneity of incoming information than do homogeneous ties linking a firm to

exchange partners that represent the same groups within a social structure. Secondly, a strong entrepreneurial capacity allows a firm to realize economic value of heterogeneous information, and moreover it allows a firm to exploit a broad range of heterogeneous information by prompting the process of resource reallocation. Tying together these notions, by enabling a firm to capitalize on a broader scope of heterogeneous changes, stronger entrepreneurial capacity increases the likelihood of opportunity exploitation resulting in superior firm performance.

While the first part of the dissertation introduces the new concept of entrepreneurial capacity focusing on its role during the process of opportunity exploitation, the second part of this project aims to investigate how contextual factors can affect the likelihood of opportunity exploitation. Recent research suggests that contextual factors may play an essential role in this regard as they may determine the scope of entrepreneurial activities that take place within a firm (Zahra, Hayton & Salvato, 2004; Barney, Clark, & Alvarez, 2003; Shane, 2003). In addition, the current literature establishes that individual level attitudes and behaviors may play a key role in the context of organizational objectives (Kozlowski & Klein, 2000; Schuler & Jackson, 1987). Given these assumption, the second part of the dissertation investigates the role of organizational culture during the process of opportunity exploitation. Organizational culture is defined as collective meanings and assumptions learned and shared by employees, and considered as valid ways to perceive, think, and act in relation to organizational problems (Schein, 2004), while a culture of innovation is defined in this dissertation as a culture mandating employee engagement in behaviors that support the process of opportunity exploitation.

In his theoretical model, Chen (1996) identifies the key factors that can predict successful organizational actions (Chen, 1996). The Awareness-Motivation-Capability (AMC) framework, proposes that a firm's successful behaviors require a coexistence of these three key components.

According to Chen (1996), awareness refers to a firm's ability to access critical information residing in the environment, and thus represent a firm's market awareness. Conversely, motivation pertains to a critical role of an incentive system that can mobilize a firm's internal resources to effectively implement a firm's business objectives. Lastly, capability refers to the decision-making processes during which a firm determines a scope of future actions pertaining to resource utilization. While applying the A-M-C framework to the model proposed in this dissertation, this study suggests that a firm will increase the likelihood of successful exploitation of new opportunities, when a firm develops a high level of network diversity (environmental awareness), culture of innovation (internal motivation) and absorptive capacity (capability).

The Weberian perspective on entrepreneurship links differences in the level of entrepreneurial activities across groups to variation in cultural norms and values. Thus, it strongly suggests that members of a group become engaged in entrepreneurial activities due to their compliance with isomorphic pressure imposed by cultural norms and values established and accepted within a group (Weber, 1930). Cultural norms and values are perceived as the main source of normative pressure that shapes individual behaviors, as well as social interactions among individuals and groups (DiMaggio & Powell, 1983). Consequently, organizational cultures that establish unique sets of norms and meanings should result in heterogeneity of employee attitudes and behaviors across firms (Barney, 1986). Given this research tenant, this dissertation proposes that when a firm establishes cultural understandings that elicit employee behaviors supporting the process of innovation, such behaviors may positively affect the likelihood of opportunity exploitation. The study proposes therefore that a culture of innovation, one that endorses innovation as a key organizational objective, can positively moderate the role of entrepreneurial capacity in the process of opportunity exploitation.

Research shows that the degree to which a firm's culture promotes innovation can be positively associated with employee engagement in behaviors supporting the process of innovation (Zahra, Hayton & Salvato, 2004; Van de Ven, 1993; Shane, 1993). Scott and Bruce (1994) describe such employee behaviors as innovative behaviors (e.g., a search for new ideas, collaboration, collective problem solving, and open communication). Building on these assumptions, the dissertation proposes that a stronger culture of innovation should reinforce the role of entrepreneurial capacity in the context of firm performance. The positive effect of a culture of innovation on the opportunity exploitation process takes place because a stronger culture of innovation should generate stronger normative pressure mandating employee engagement in behaviors that will support the process of innovation. Employee engagement in innovative behaviors should reinforce a firm's ability to internally disseminate a broader scope of newly acquired external ideas. Moreover, it should allow a firm to integrate a broader scope of new alternative perspectives into existing stocks of knowledge, and more effectively disseminate such newly created knowledge within the firm in order to amend existing organizational processes. Consequently, a stronger culture of innovation should allow a firm to exploit a broader scope of new opportunities resulting in superior firm performance.

To empirically test the model proposed in this dissertation, the healthcare industry was selected as the empirical setting. At 18%, health care accounts for a very substantial portion of the Gross Domestic Product (GDP) in the United States (Organization for Economic Co-operation and Development; OECD, 2013). By comparison, expenditures associated with defense add up to 4.7 % of country's GDP (World Bank, 2011). These enormous costs associated with health care, almost twice as high as similar costs in other highly developed countries, are often cited as a major economic obstacle, and one of the biggest challenges to the country's

future (Centers for Medicare and Medicaid Services; Congressional Budget Office, 2011). Unfortunately, these larger expenditures do not translate into gains in quality of medical care, defined here in terms of clinical outcomes of medical treatment provided to patients. Health care statistics strongly suggest that the quality of medical care in the United States falls significantly below standards set by healthcare systems in other industrialized countries (Institute of Medicine, 2012; Commonwealth Fund Commission on High Performance Health System, 2008; World Health Organization, 2000). Furthermore, research indicates the existence of a very troublesome variance in the quality of medical care provided by hospitals across the United States; this has become an alarming feature of the American healthcare system. Alongside the best hospitals in the world, which are widely recognized for superior quality of medical service, many hospitals in the United States offer an unacceptably low quality of medical provision (Agency for Healthcare Research & Quality, 2011; Dickey, Corrigan, Denham, 2010; Henriksen, Battles, Marks & Lewin, 2005; Hussey, Anderson, Osborn, Feek, McLaughlin, Millar, & Epstein, 2004). Not surprisingly, the inefficiency and ineffectiveness of the healthcare system increased pressure on hospitals to find new ways to reduce operational costs while improving the lagging quality of care. According to research, in order to deal with this growing problem, healthcare organizations in the United States have turned to healthcare innovation, which has quickly become an important driver of their economic success (Avgar, Givan & Liu, 2010). Healthcare innovation is defined as the implementation of new services, processes, or systems that results in improved medical care outcomes related to safety, effectiveness, timeliness, and for efficiency (Agency for Healthcare Research and Quality, 2011). Based on extensive research, the dynamic healthcare industry provides as appropriate, empirical setting to study innovation

(e.g., Avgar, Givan & Liu, 2010; Omachonu & Einspruch, 2010; Lansisalmi, Kivimaki, Aalto & Ruoranen, 2006).

While addressing the question of what factors separate organizations able to capitalize on changing external contingencies from organizations that fail to do so, this project concentrates on the role of entrepreneurial capacity. Entrepreneurial capacity in health care is defined as a unit's ability to exploit new opportunities pertaining to healthcare innovation, such as new medical services, methods of medical care delivery, or process improvements that can result in improved quality of medical care provided to patients. Consistent with this reasoning, this dissertation suggests that firms with a higher level of entrepreneurial capacity provide better quality of medical care to their patients. This association takes place because units with a higher level of entrepreneurial capacity are better equipped to access a broader range of heterogeneous information signaling a broader array of novel developments, which may be vital to business operations of healthcare organizations. Furthermore, such units have stronger ability to realize the relevance of the broader scope of such new developments, and are better equipped to effectively capitalize on them in order to improve the effectiveness of internal operations. This process should result in superior organizational performance.

To conduct the empirical tests of these assumptions, the study uses the data collected from independent emergency departments operating at hospitals located in 14 states across the United States. In addition to big hospitals located in large metropolitan areas, the sample also includes smaller hospitals located in academic centers, small towns, and in many rural areas. Such a diverse sample should well represent true geographical and demographic heterogeneity of the healthcare industry and the cultural diversity of United States as a whole.

The empirical analyses reveal that the data support some hypotheses theorized by the model. Results show that emergency departments possessing stronger entrepreneurial capacity provide superior quality of medical care, measured in terms of clinical outcomes of medical care. Moreover, the data also show a significant role of culture of innovation in the process of opportunity exploitation.

Definitions of key concepts

The following terms and definitions are used in this study. This section provides short descriptions of each concept. Extended definitions, literature reviews and analyses are included in later chapters.

Opportunities: Building on the existing literature (Casson, 1982), opportunities are defined here as situations in which new products, services, or methods of organization can be introduced in order to generate improved organizational performance.

The ability to discover and create new opportunities: Drawing on the existing literature (e.g., Dencker, Gruber & Shah, 2009; Alvarez & Barney, 2007; Shane & Venkataraman, 2000), the ability to discover or create new opportunities is defined in terms of a firm's ability to comprehend the meaning and value of incoming external information. Such information may signal the existence of exogenous opportunities, which are ready to be discovered. Furthermore, such information may also signal environmental changes that should be internally utilized to increase efficiency of a firm's operations, which results in the creation of new endogenous opportunities.

Opportunity identification: In this dissertation, opportunity identification is defined as the process by which a firm either discovers new exogenous opportunities or creates new endogenous opportunities.

Opportunity exploitation: Opportunity exploitation is the process during which a firm reallocates its internal resources in order to introduce new products, services, or more efficient processes which results in improved firm performance.

Network diversity: Building on research on network heterogeneity (Goerzen & Beamish, 2005; Goerzen, 2001; Powell, Koput & Smith-Doerr, 1996), in this study network diversity is defined in terms of quantity of external connections that a firm establishes with business partners who represent dispersed parts of a social structure.

Absorptive capacity: Absorptive capacity is defined in terms of dynamic organizational capabilities that permit a firm to recognize the meaning and value of new information to process and assimilate such information, and exploit it in order to create new economic rents (Zahra & George, 2002; Cohen & Levinthal, 1990).

Entrepreneurial capacity: Entrepreneurial capacity is defined in this dissertation as a firm's capacity that is composed of two critical dimensions: network diversity and absorptive capacity. Entrepreneurial capacity enables a continuous process of opportunity exploitation. This process takes place because entrepreneurial capacity allows a firm to access and capitalize on a broad scope of new heterogeneous information resulting in superior firm performance.

Entrepreneurial capacity in health care: Entrepreneurial capacity in health care is defined in this dissertation as the ability of emergency department to exploit new opportunities that result in improved quality of medical care provided to patients of emergency departments.

Culture of innovation: Consistent with the existing literature, culture of innovation is defined here in terms of collective norms and understandings that elicit employee support for the process of opportunity exploitation. This support is exemplified by employee behaviors, such as a search for novel ideas, open communication among employees, and collaborative problem solving efforts.

Healthcare innovation: Healthcare innovation is defined as the implementation of novel ideas regarding new services, processes, or systems that results in improved patient outcomes related to safety, effectiveness, timeliness, or efficiency of medical care (Agency for Healthcare Research and Quality, 2011).

Performance of emergency departments: Drawing on research in healthcare management, performance of emergency departments is defined in terms of the quality of medical care provided to patients. According to the literature, such quality can be measured by clinical outcomes and patient satisfaction (Lester & Roland, 2010; Nelson, Mohr, Batalden & Plume, 1996).

Statement of the problem

Current research posits that aging firms become a guardian of the dominant social paradigms (March, 1991; Stinchcombe, 1965). As an integral element of the prevalent “logic of appropriateness,” mature organizations become complacent, make safer choices, and thus slowly become less responsive to external stimuli; this evolution of an organization’s logic may lead to their demise.

This dissertation aims to introduce an alternative framework explaining how firms can maintain their sustained competitive advantage over time. It proposes that firms can remain

successful when they develop strong entrepreneurial capacity, which enables firms to access, understand the meaning and capitalize on the broad scope of new heterogeneous information. This proposition is empirically tested in the healthcare industry, in which, according to research, innovation has become the key determinant of organizational success (e.g., Avgar, Givan & Liu, 2010). Despite the highest overall and the highest per capita spending on health care, the quality of medical care provided by American healthcare organizations falls below quality standards set by other highly developed countries. Although current research on healthcare has identified innovation as a critical means for performance improvements, no empirical studies explain how the process of opportunity exploitation can increase the likelihood of healthcare innovation. To address this issue, the dissertation empirically tests the role of entrepreneurial capacity in the context of firm performance, measured by the quality of medical care provided by emergency departments in the United States.

In the second part of this dissertation, the role of organizational culture is investigated in the context of opportunity exploitation. Employee-level assessment of organizational values receives growing attention from scholars as a potentially important predictor of employee and group behaviors (Schein, 2004, Kozlowski & Klein, 2000). Thus, the importance of understanding how employee perception of shared organizational norms could affect the quality of medical care may provide managers with valuable knowledge, which could be used to prompt the process of organizational change resulting in improved firm performance.

Purpose of the study and research questions

The primary goal of this study is to identify organizational antecedents that can allow a firm to remain successful over time by increasing the likelihood of opportunity exploitation.

Thus, this dissertation introduces the concept of entrepreneurial capacity and aims to empirically test the notion that entrepreneurial capacity can be positively associated with firm performance. Second, very few empirical studies show the role of heterogeneity of external networks in the context of firm performance. The existing literature presents mixed results associated with this relationship. Third, to the extent of my knowledge, no empirical studies have investigated how cultural norms can affect the stages of the process of opportunity exploitation. Furthermore, to the extent of my knowledge, no empirical studies have investigated all of these important research issues in the context of health care. Consequently, the objective of this dissertation is to provide empirical answers to the following main research questions:

How can stronger entrepreneurial capacity allow firms to improve their performance?

What is the relationship between the heterogeneity of external networks connecting isolated parts of a social structure and firm performance?

What is the role of the interactive effect of heterogeneity of external sources of information and the ability to understand and utilize such heterogeneity of information in the context of firm performance?

How can organizational culture of innovation positively affect the likelihood of opportunity exploitation, and therefore positively affect the relationship between entrepreneurial capacity and firm performance?

Significance of the study

This dissertation draws upon a variety of existing theories and aims to further research on entrepreneurship, strategy, networks and healthcare management. First, the study introduces a new concept—entrepreneurial capacity. It posits that entrepreneurial capacity can be positively

related to firm performance, as it facilitates the continuous process of opportunity exploitation. Thus, the study aims to empirically show that when a firm develops the ability to facilitate an ongoing process of opportunity exploitation, a firm can remain successful over time. The study proposes that such a process could take place because a stronger entrepreneurial capacity allows a firm to identify a broader spectrum of new heterogeneous opportunities, and find better internal applications for such new opportunities. This should consequently result in the higher likelihood of opportunity exploitation resulting in superior firm performance.

The model tested in the study links performance of emergency departments to the interactions of heterogeneous networks, absorptive capacity, and culture of innovation. By examining the interactive effects among these factors in the context of firm performance, the study aims to provide valuable feedback to managers in all industries, and particularly valuable feedback to managers in health care. Results of this study could be used by managers to take concrete steps to strengthen organizational competencies that, as the study suggests, may be positively associated with improved quality of medical care. For example, this research illustrates that reinforcing heterogeneity of external partnerships can play a key role in the process of opportunity exploitation.

Overall, I submit that the theoretical and practical contributions of this dissertation reside in the fact that it theorizes and tests the model showing that the joint, interactive effect of internal and external organizations competencies can result in furthering organizational success.

Overview of the chapters

Following this introduction (chapter1), chapter 2 introduces the concept of entrepreneurial capacity, and explains the organizational role of entrepreneurial capacity in the

context of firm performance. Chapter 3 provides an overview of the healthcare industry in the United States, which constitute the empirical setting for this research. Chapter 4 focuses on the role of network diversity on firm performance, providing a comprehensive review of the relevant literature on social capital and networks. This chapter proposes that heterogeneous external contacts can be conducive in accessing a broad scope of heterogeneous information signaling new external developments. Chapter 5 reviews the literature on strategy and organizational learning, and investigates the role of absorptive capacity in the context of firm performance, as well as the interactive role of network diversity and absorptive capacity in the context of performance. It posits that absorptive capacity allows organizations to realize the value and capitalize on a broader scope of heterogeneous opportunities. The interactive effect enhances firm performance by increasing the likelihood of opportunity exploitation.

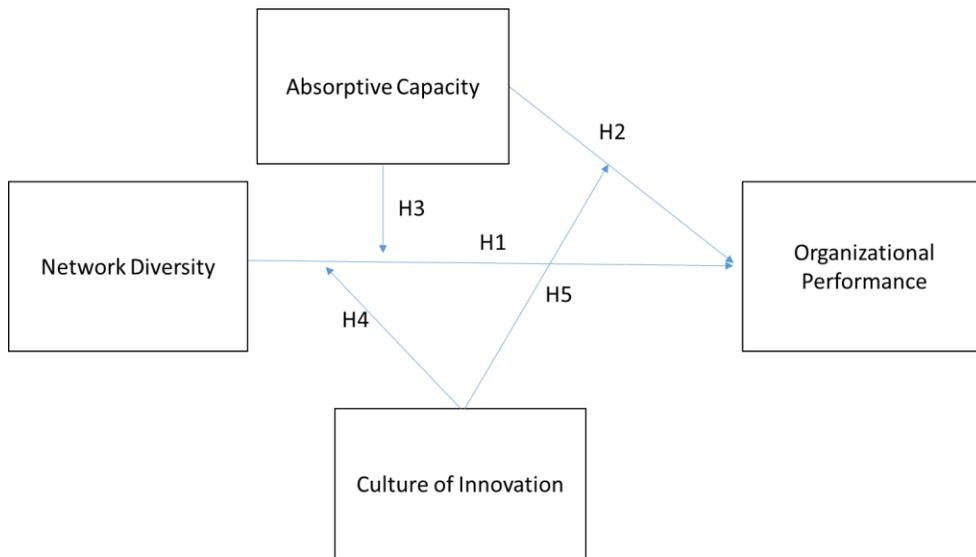
Chapter 6 focuses on the role of organizational context in the process of opportunity exploitation. Specifically, drawing on research on sociology, culture and innovation, the chapter investigates the effect of culture of innovation on the process of opportunity exploitation, proposing that stronger culture promoting innovation will induce employee behaviors supporting the process of opportunity exploitation. By supporting the process of internal change, such behaviors can increase the likelihood of opportunity exploitation.

Chapter 7 provides an explanation of the procedure and methodology used in to statistically test the assumptions suggested by this research. Chapter 8 presents results of the statistical analysis. Chapter 9 discusses the findings, contribution, research limitations, as well as the direction for future research.

Proposed model and hypotheses

FIGURE 1

The relationships of network diversity, absorptive capacity and culture of innovation in the context of organizational performance



Main Effect Hypotheses:

H1: The relationship between network diversity and firm performance

H2: The relationship between absorptive capacity and firm performance

Moderating Effect Hypotheses:

H3: Moderating effect of absorptive capacity on the relationship between network diversity and firm performance

H4: Moderating effect of culture of innovation on the relationship between network diversity and firm performance

H5: Moderating effect of culture of innovation on the relationship between absorptive capacity and firm performance

CHAPTER 2

ENTREPRENEURIAL CAPACITY: THE ABILITY TO EXPLOIT NEW OPPORTUNITIES

Research defines entrepreneurship in many ways. These definitions reflect scholarly interest in often divergent factors that generate variations in entrepreneurial activities. These factors include, for example, differences in individual personality traits, governmental policy, uncertainty, or risk taking. They also include the process of discovering, creating and exploiting of new opportunities driven by heterogeneity of internal resources that a unit possesses (Alvarez, Barney & Anderson, 2013; Klein, 2008; Alvarez & Barney, 2007; Kor, Mahoney & Michael, 2007; Shane & Venkataraman, 2000; Kirzner 1973; Schumpeter, 1934; Knight, 1921).

The French economist Jean Baptiste Say is credited to be the first to define entrepreneurship in terms of “shifting economic resources out of an area of lower productivity into an area of higher productivity and greater yield” (Drucker, 1985 p. 21). Consistent with this description, entrepreneurship is defined in this dissertation as the process of allocating resources to generate performance improvement resulting from the introduction of new products, services, or methods of organizing production.

Out of the many definitions of entrepreneurship introduced by research, the opportunity perspective has emerged as dominant during the last decade. This dissertation applies the opportunity perspective of entrepreneurship, the aim of which is to explain mechanisms that permit a unit to successfully discover or create new opportunities in order to generate new economic value (Dencker, Gruber & Shah, 2009; Alvarez & Barney, 2007; Shane, 2003; Shane & Venkataraman, 2000; Kirzner, 1973; Schumpeter, 1934). In the following chapter, the dissertation posits that when a firm realizes that new opportunities can generate superior performance outcomes, a firm exploits such opportunities by reallocating its internal resources.

This process of opportunity exploitation results in new products, services, or new methods of organizing production and can consequently lead to improved organizational performance.

Existing perspectives: Firm performance as an outcome of the process of opportunity discovery or creation

Opportunities are defined as situations in which new products, services or methods of organizing can be introduced in a market to generate economic profits (Casson, 1982). Based on how new opportunities come to exist, the literature distinguishes between two types of opportunities: exogenous and endogenous. Exogenous opportunities are viewed as independent phenomena that can be discovered. Other opportunities are viewed as endogenously “created” by individuals or firms (Alvarez, Barney & Anderson, 2013; Kor, Mahoney & Michael, 2007; Alvarez & Barney, 2007; Shane & Venkataraman, 2000; Kirzner, 1973; Schumpeter, 1934).

While describing the mechanisms that bring about new opportunities, Alvarez, Barney and Anderson (2013) recognize two distinctive theoretical frameworks: the Schumpeterian and the Kirznerian. Rooted in social constructionism (Berger & Luckman, 1966), the Schumpeterian perspective (1934) postulates that opportunities are created endogenously. Here, entrepreneurs actively generate opportunities during searches for solutions that aim to challenge the existing organizational *status quo*. Thus, the process of opportunity creation takes place when a firm looks for alternative solutions to existing problems. During such searches, heterogeneity of internal resources will allow a firm to identify the scope of alternatives that a firm can consider in order to improve its current operations. When acceptable solutions are identified, a firm then can start entrepreneurial activities aiming to reconfigure its available resources, allowing the introduction of internal changes that generate higher profitability and sustainability (Alvarez & Parker, 2009; Barney, 1991). Consequently, according to this perspective, opportunities are

dependent on entrepreneurs, and, as such, are “generated” endogenously. They are a product of heterogeneity of resources, which are path dependent and based on collective experience and knowledge accumulated during a unit’s life trajectory (Barney, 1991). Heterogeneity of internal resources may significantly vary across units. As a result, units with a different set of unique resources will devise different sets of new opportunities that may boost the efficiency of internal operations. Moreover, according to this view, the process of “creation” of opportunities can occur under the condition of environmental uncertainty, as the main focus of the process remains a proactive internal search for alternatives to organizational problems. Consequently, the process can take place without an exogenous intervention (Alvarez, Barney & Anderson, 2013; Alvarez & Barney, 2007).

The Kirznerian approach (1973), by contrast, views entrepreneurial opportunities as phenomena that exist independently from their discoverers. Entrepreneurial actions, according to this perspective, focus on the act of discovery. Kirzner (1973) posits that opportunities are formed exogenously by the process of external shocks, or changes that lead to a new disequilibrium emerging in external markets. According to this logic, external forces such as technological, political, or cultural shifts can disrupt and challenge the existing *status quo*, thereby creating new independently existing “situations” to generate profits. Such newly generated external opportunities can then be discovered by units that encounter them, provided the units possess “alertness,” or the ability to understand and utilize the economic value of these particular opportunities (Shane & Venkataraman, 2000; Kirzner, 1997; Kirzner, 1973). Because opportunities are exogenous and exist independently in the environment, the process of opportunity discovery remains contingent on the firm’s level of “alertness”. According to this assumption, only a nexus between firms possessing this “alertness,” or the right stock of

preexisting knowledge and experience, and the right set of opportunities can lead to the discovery of opportunities. Thus, opportunity discovery is dependent on the unique combination of prior knowledge and experience that constitutes a “knowledge corridor” (Hayek, 1945). This implies that only individuals or firms with the right knowledge and experience can realize how new opportunities can be internally used to generate economic profits (Shane, 2003; Shane & Venkataraman, 2000; Hayek, 1945). In his empirical study, Shane (2000) illustrates this process by demonstrating that, *ceteris paribus*, entrepreneurs with unique stocks of prior knowledge discover completely different sets of entrepreneurial opportunities. In contrast to the process of opportunity creation, the Kirznerian perspective of opportunity discovery does not require a proactive search for alternative solutions to existing internal problems. New opportunities can be discovered merely by chance or even by luck when an “alert” unit finds itself in the right place at the right time and encounters the right set of opportunities.

Integrative approach: Mechanisms enabling the process of opportunity exploitation

In order to integrate two competing perspectives (Kirznerian and Schumpeterian), this dissertation posits that opportunities should be viewed both as objective and subjective phenomena. Thereby, instead of focusing the debate on the sources of new opportunities, this dissertation aims to reinforce the importance of organizational mechanisms that can increase the likelihood of opportunity exploitation that results in superior firm performance.

The dissertation assumes that new opportunities can exist objectively in the environment and, as such, can be discovered by a firm. However, the dissertation also assumes that new opportunities can be subjectively created by the same firm, when such a firm initiates an internal search for efficiency of its internal operations. Once a firm successfully identifies (discovers or

creates) new opportunities, a firm can begin the process of opportunity exploitation. The process will take place when a firm undertakes necessary entrepreneurial activities aiming to reallocate its internal resources, which results in the introduction of new products, services or more effective methods of organizing production.

Drawing on contingency theory and the open system perspective (Thompson, 1967; Lawrence & Lorsch, 1967; Stinchcombe, 1965), this dissertation views a firm as a part of a larger ecosystem, thus it emphasizes the key role of external structural connections between a firm and its environment. Consequently, the dissertation posits that more diverse connections will link a firm with a larger number of different, often disconnected elements of a social structure. Such heterogeneous connections that represent the heterogeneity of socio-economic paradigms coexisting in the world, should produce a broad range of incoming ideas that can be used by a firm to initiate the process of new opportunity exploitation. The degree of heterogeneity of external ties between a firm and its environment will determine the degree of heterogeneity of new incoming information. Higher heterogeneity of external ties should produce more heterogeneous information than the information provided by homogeneous ties linking exchange partners located in the same part of a social structure. The higher heterogeneity of incoming information should therefore signal a broader array of new cues regarding impending environmental changes.

These new incoming signals can be used by a firm in the following two ways: First, the signals may indicate the existence of a broader range of new opportunities that already wait to be discovered in various parts of a social structure. Second, such heterogeneous cues may also expose a firm to a broader scope of new alternatives pertinent to a firm's operations. The broader range of new incoming ideas should provide a firm with more alternative ways of looking at its

current operations. It should therefore initiate a higher number of new searches that will aim to increase the efficiency of a firm's internal resources. This process should consequently lead to a broader range of newly created opportunities.

The subsequent exploitation of a broader range of newly discovered or newly created opportunities should result in the introduction of new products, services or methods of organizing productions, leading to superior firm performance.

The ability to exploit new opportunities

When a firm accesses new external information, it can derive economic benefit from the asymmetric distribution of information (Hayek, 1945). Access to new information that signals imminent environmental change can thereby become a critical asset, allowing some firms to exploit new opportunities before their competitors (Kirzner, 1973). Such firms can then gain an advantage over other firms, as the process of opportunity exploitation leads to the introduction of new products or services that have been anticipated by the marketplace. This process should result in superior firm performance.

The number of newly exploited opportunities may depend on more than merely having access to some information signaling impending environmental change. First, it may require access to highly heterogeneous information representing a wide range of novel ideas incoming from different parts of the environment. High heterogeneity of incoming information should expose a firm to a broader range of heterogeneous developments that may be pertinent to a firm's operations. This heterogeneity can therefore signal a broader scope of new opportunities that already wait to be discovered. Furthermore, such heterogeneity of new perspectives can also expose a firm to a broader scope of novel ideas signaling that a firm should consider making

improvements that may increase efficiency of its existing operations. Thus, heterogeneity of incoming information may also result in a broader scope of newly created opportunities.

The number of newly discovered or created opportunities may however also depend on a firm's endogenous cognitive ability to comprehend the value of a wide scope of heterogeneous information incoming from the environment. Due to heterogeneity of internal resources, such cognitive ability could significantly vary across firms, allowing some of firms to discover or create a higher number of new opportunities than other firms. Yet, not all firms will fully comprehend various possible applications for a broad scope of new developments. Firms with stronger cognitive ability should be more "alert" to a higher number of exogenous opportunities. This should allow such firms to discover and exploit a larger pool of new exogenous opportunities. Stronger cognitive ability should also enable a firm to realize how a higher number of external ideas could be internally applied to improve the effectiveness of a firm's existing operations. This could prompt the process of opportunity creation and exploitation resulting in superior firm performance. Consistent with this tenant, this dissertation proposes that the process of opportunity exploitation is enabled by a firm's entrepreneurial capacity comprising two critical dimensions: network diversity and absorptive capacity.

Entrepreneurial capacity

In attempt to integrate the existing literature that focuses on the process of opportunity discovery or creation, this dissertation introduces the concept of entrepreneurial capacity, which is defined here as an organizational mechanism that permits an ongoing process of opportunity exploitation. By establishing heterogeneous ties with a wide range of external partners, entrepreneurial capacity facilitates an ongoing influx of a wide scope of heterogeneous

information signaling a variety of new developments taking place in disjoint parts of a social structure. By enabling the realization of how such heterogeneous information can challenge a firm's existing internal operations, entrepreneurial capacity allows a firm to increase the likelihood of exploiting a wide scope of new developments that could increase the effectiveness of such operations. Consequently, stronger entrepreneurial capacity should result in a higher number of exploited opportunities. Practically speaking, firms with stronger entrepreneurial capacity will learn more about the changing world, and will also be able to better comprehend the significance of such changes. As such, firms with stronger entrepreneurial capacity will be better equipped to capitalize on a broader scope of external developments, which should allow them to continuously exploit new opportunities over time.

Network diversity is the first dimension of entrepreneurial capacity. It captures heterogeneity of structural ties between a firm and its environment. Consequently, network diversity is defined here as the number of inter-organizational links between a firm and its external partners who represent scattered groups within a social structure. Because network diversity supports pivotal connections between an organization and the environment, it determines the scope of information incoming into a firm. The types of information a firm is able to access will depend therefore on the kind of external connections that a firm develops. When a firm develops, for example, heterogeneous ties with external partners located in geographically distinct areas, such as exchange partners in Washington, Moscow and Beijing, a firm should be equipped to better infiltrate many of the disjointed parts of its social structure. Consequently a firm will become exposed to competing social paradigms, and thus will find out about a wider range of alternative perspectives. This should result in a broader influx of "richer," more heterogeneous information signaling a broader array of ongoing environmental changes. Given

this assumption, this dissertation proposes that a higher level of heterogeneity of network ties between a firm and its external partners should generate a broader influx of information, signaling the existence of a larger pool of new exogenous opportunities that are ready to be discovered.

Highly heterogeneous information incoming via heterogeneous networks can be also used to initiate the process of opportunity creation. Due to a broader scope of incoming information, firms should become exposed to a larger array of alternative views, which may prompt a higher number of new searches for the more efficient allocation of organizational resources. This process should result in a larger pool of new opportunities that a firm can create. Given this assumption, a higher level of network diversity should generate a larger pool of newly created opportunities that a firm can exploit. When exploited, newly discovered or created opportunities should result in superior firm performance.

Absorptive capacity is the second critical dimension of entrepreneurial capacity. It is defined in this dissertation as a firm's cognitive ability that allows it to identify (discover or create) and exploit new opportunities. The level of absorptive capacity will determine how much of the new heterogeneous information incoming via diverse networks, a firm will be actually able to correctly comprehend, process, and internally utilize to generate new value. Stronger absorptive capacity should allow a firm to recognize the meaning and significance of a broader array of heterogeneous information representing heterogeneity of the world.

When incoming information signals that new exogenous opportunities already exist somewhere in the world, stronger absorptive capacity should make a firm more "alert" to a broader scope of such new opportunities. In such a case, due to its stronger cognitive ability, a firm should be also able to find more internal applications for a wider pool of newly discovered

opportunities. This should result in the exploitation of a wider scope of new exogenous opportunities.

Absorptive capacity should also facilitate the process of opportunity creation. When a firm is able to better comprehend the meaning and value of a broader scope of heterogeneous ideas, such a firm should consider a wider pool of alternatives that may address its organizational problems. Consequently, such a firm should more often initiate the process of internal change, upon realizations that the effectiveness of its internal operations can be increased. This process should create of a broader scope of new endogenous opportunities. When a firm exploits such new opportunities by reallocating its internal resources, the process should result in superior firm performance.

A higher level of network diversity should enable a firm to gain access to a broader range of heterogeneous information signaling a wider array of new external developments. By increasing a firm's cognitive ability, stronger absorptive capacity should permit a firm to find better internal applications for a broader scope of new ideas. When combined together, the interaction between a higher level of network diversity and a higher level of absorptive capacity should increase the likelihood of exploiting a wider range of new opportunities resulting in improved firm performance. A high level of network diversity coupled with a high level of absorptive capacity should allow a firm to avoid making costly diagnostic errors (a type 1 and a type 2 error), because a firm with greater entrepreneurial capacity should be better equipped to make wiser strategic choices pertaining to utilization of its resources. Consequently, greater entrepreneurial capacity should decrease the likelihood of failures associated with rejecting new ideas that could have created new value (when exploited), or due to the exploitation of such new

ideas that should not be exploited because of their low potential to generate new economic rents in a given organizational context.

Entrepreneurial capacity, a mechanism that enables the ongoing process of opportunity exploitation, should be viewed as a dynamic construct. The strength of entrepreneurial capacity could fluctuate over time on a continuum from low to high, as the current strength of a firm's entrepreneurial capacity will depend on the development level of the two critical dimensions. Given this assumption, a high level of entrepreneurial capacity will take place at firms where the interaction between absorptive capacity and network diversity is strong, while a low level of entrepreneurial capacity signifies a low level of network diversity coupled with a low level of absorptive capacity.

A high level of both dimensions—a high level of network diversity and a high level of absorptive capacity—should result in optimal organizational outcomes, because the joint effect of the two constructs represents a broad access to heterogeneous information and a strong ability to capitalize on such a broad scope of new ideas. This configuration should consequently produce the highest number of newly discovered and created opportunities, increasing the likelihood of exploiting only such opportunities that will lead to superior firm performance. Firms with greater entrepreneurial capacity should reduce the likelihood of making type 1 and type 2 errors, as they make wiser organizational choices that result in more efficient utilization of a firm's internal resources.

Firms possessing a high level of network diversity, but a low level of absorptive capacity will remain very open to the external environment. Nonetheless, such firms lack the ability to fully comprehend the meaning and value of a wide range of new external developments. They may therefore rely on the process of opportunity discovery, discovering mostly opportunities that

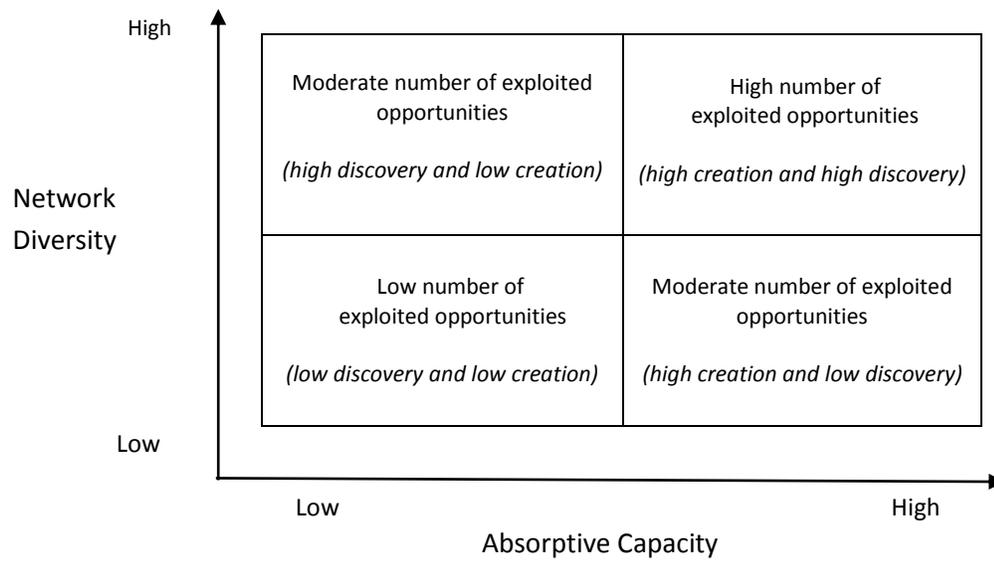
do not require a strong cognitive ability. Their weak absorptive capacity will however significantly reduce their ability to create new endogenous opportunities.

Firms with a high level of absorptive capacity, but a low level of network diversity will remain relatively isolated from their external environment. Very limited access to a broad scope of external developments may significantly reduce a firm's access to new information signaling the existence of exogenous opportunities. Weak access to new external information may also imply that such firms may have to strongly rely on their internal cognitive ability, which may prompt new searches for process improvements, and thus facilitate the process of opportunity creation.

A low level of entrepreneurial capacity signifies an interaction of a low level of network diversity and a low level of absorptive capacity. Firms with low level of entrepreneurial capacity remain isolated from the critical influx of new information, and remain ignorant about the meaning of new information due to their low cognitive ability. This interaction can imply that a firm will not be able to either discover, create, or exploit a large number of new opportunities resulting in superior performance. Consequently, the joint effect of weak network diversity and weak absorptive capacity will likely result in many diagnostic errors (type 1 and type errors), as a firm fails to find out about critical external developments, or miscomprehends their meanings and significance. Consequently, a firm exploits opportunities without a full understanding of their economic potential. As a result, such a firm may often exploit opportunities that should not be exploited, while missing on opportunities that could have resulted in generating new profits. This process may result in decreased organizational performance, and, over time, may lead to a firm's economic demise.

FIGURE 2

Entrepreneurial capacity in the context of opportunity exploitation



Entrepreneurial capacity in health care

This dissertation introduces the concept of entrepreneurial capacity. Furthermore, it empirically tests the role of entrepreneurial capacity in the context of opportunity exploitation in health care. Entrepreneurial capacity should play a pivotal role in the case of healthcare organizations. In this context, entrepreneurial capacity represents the ability to exploit new opportunities in the form of healthcare innovation. If developed and continuously upgraded, stronger entrepreneurial capacity could provide healthcare organizations, such as emergency departments, with a broader influx of novel ideas that could be utilized to improve day to day operations at those departments. For example, new information gained from external partners could signal the development of the new data management technology. Some healthcare organizations may realize that such a new generic technological advancement can be successfully applied in the medical setting. As a result, some emergency departments can quickly make necessary adjustments to existing internal processes through the use of new technology. Thus, they can exploit this new opportunity by linking various sources of data storing medical records. This internal change will enable medical staff working at emergency departments to more quickly retrieve critical information pertinent to the medical history of their patients. Consequently, it will increase the effectiveness of internal operations, improving the quality of medical services experienced by patients.

When successfully applied in the health care context, new technological developments can significantly shorten a critical diagnosis time, can reduce patient wait time for necessary medical tests and treatment, or wait time for hospital admission. Furthermore, by allowing quicker access to existing medical records, the newly updated system may increase the likelihood of correct diagnosis and treatment, reducing the likelihood of medical staff committing critical

medical errors. This type of healthcare innovation should therefore positively impact the performance of emergency departments by improving the quality of medical care provided to patients. Not all emergency departments will however be able to take advantage of such new technological advancements. Some departments, due to their low entrepreneurial capacity, will not be able to find out about many important technological changes. Some other emergency departments, due to their low entrepreneurial capacity, will never be able to fully comprehend how new technological advancements could be important to their operations. Thus, they will not be able to fully capitalize on such developments in order to drive up the effectiveness of internal operations.

This dissertation proposes that healthcare organizations, such as emergency departments possessing stronger entrepreneurial capacity will be able to access a broader scope of external information regarding new developments than emergency departments with weaker entrepreneurial capacity. Moreover, emergency departments with stronger entrepreneurial capacity will be better equipped to comprehend the meaning and significance of a broader range of external developments relevant for their future business operations. Consequently, emergency departments with stronger entrepreneurial capacity will be better positioned to identify and implement alternative ways of improving their day to day operations. Such implementation of new ideas should result in more healthcare innovation in the form of process improvements, new services provided to patients, or more efficient methods of medical care delivery. Operational improvements executed by emergency departments with stronger entrepreneurial capacity should result in improved firm performance as measured by clinical outcomes, such as patient treatment outcomes and patient satisfaction. Stronger entrepreneurial capacity, the dissertation proposes, should therefore result in better performance by emergency departments.

Summary

Entrepreneurial capacity signifies a firm's ability to access, process and take advantage of a broad scope of external changes that take place in the world. Access to a broad range of heterogeneous information and a strong cognitive ability to understand and capitalize on such a broad heterogeneity of new ideas should decrease the number of diagnostic errors that a firm makes (type 1 and type 2 errors). Conversely, strong entrepreneurial capacity should increase the likelihood of opportunity exploitation that will result in superior performance. Over time, this process should allow firms to remain entrepreneurial at any stage of their existence. By facilitating an ongoing process of opportunity exploitation, entrepreneurial capacity allows a firm to continuously amend its internal operations based on changing requirements of the external environment. Consequently, entrepreneurial capacity enables a firm to continuously increase the level of congruence between evolving, external demands and a firm's business strategy that aims to address such demands. Thereby, entrepreneurial capacity boosts the likelihood of continuous organizational success.

Strong entrepreneurial capacity comprised of diverse structural connections and higher cognitive ability to internalize and exploit heterogeneous information, should increase the likelihood of exploiting a broader scope of new opportunities. When continuously updated and reinforced stronger entrepreneurial capacity should allow a firm to better respond to the changing world, thus it could be viewed as a continuous source of a firm's sustained competitive advantage.

CHAPTER 3

PERFORMANCE OF HEALTH CARE IN THE UNITED STATES

Today's competitive business environment demands that in order to be successful, firms must provide high quality products or services. The development of capabilities that enable firms to quickly respond to changing environmental demands is therefore critical. This dissertation focuses on the healthcare industry and the quality of medical care provided by healthcare organizations. It posits that variance in the quality of medical care provided by American emergency departments can be accounted for in part by variance in units' entrepreneurial capacity—the ability to identify and exploit new opportunities in the form of healthcare innovation.

Moreover, in the second part of this dissertation, the study also focuses on the role of organizational context. It suggests that when emergency departments develop stronger culture promoting innovation as a dominant cultural paradigm, their employees should become more engaged in innovative behaviors aiming to support the process of opportunity exploitation, and thus resulting in superior quality of medical care provided to patients.

The critical role of health care in the United States

Historically, hospitals in the United States have functioned as humanitarian institutions. As such, hospitals were not categorized as *per se* profit-seeking business organizations. Rather, they were viewed through the lens of their social mission: providing medical care to those who needed it (Omachonu & Einspruch, 2010). The organizational form of hospitals has significantly evolved over time due to changes mandated by powerful stakeholders, such as stockholders, insurance companies, the government and patients. Technological development, globalization

and professionalization of the industry, new laws and regulations have, in the last few decades, completely redefined the landscape of the industry. The new paradigm, emerging in the late 1980s, reinforced the necessity to increase financial profitability while providing good quality of medical care. In this unique industry setting, the business objective of financial profitability was consequently combined with the traditional social mission of helping those who needed medical assistance (Omachonu & Einspruch, 2010; Porter & Teisberg, 2006; Hoffman, Irwin & Digman, 1996).

While the increased emphasis on financial efficiency has redefined the character of health care during the last years, for hospitals and their employees, providing a superior quality of medical care and keeping their patents safe, has remained a fundamental focus of daily operations. Unfortunately, as research points out, hospitals in the United States have been failing both in the area of efficiency of operations and the quality of medical care. Statistics support the notion, that in the course of the last couple of decades, the cost of healthcare in the United States has reached an unparalleled level. At over \$8,600 annually, per capita spending on healthcare in the United States is almost twice as high as similar spending in other highly developed countries (OECD 2013; World Bank, 2011). Not surprisingly, in 2011, health care accounted for almost 18% of the country's Gross Domestic Product (GDP). By comparison, the United States spending on defense—often presented as a major financial burden on the country's budget—accounts only for 4.7% of the nation's GDP (World Bank, 2011).

At almost 18% of the GDP, expenditures associated with health care in the United States are enormous (OECD, 2013). According to the World Bank, similar health care related expenditures in other developed countries are significantly lower. One could expect that the highest overall expenditures and the highest per capita spending on health care would translate

into a superior quality of care provided to American society. Statistics, however, present a surprisingly unexpected picture. According to research, the quality of healthcare provided by American healthcare organizations falls short of standards established by other developed countries (World Health Organization, 2000). Moreover, research also emphasizes a very troublesome feature of the U.S. healthcare system: very substantial variance in the quality of medical care delivered to patients across American hospitals. Some American hospitals are recognized for their superior service, and as such are ranked among the best in the world. Surprisingly, many other hospitals in the United States do not meet acceptable quality standards (Hussey, Anderson, Osborn, Feek, McLaughlin, Millar, & Epstein, 2004).

Variance in quality of medical care

The Institute of Medicine (IOM) defines quality of medical care as the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current practices and professional knowledge (Institute of Medicine, 2012). Quality of medical care is therefore viewed in terms of objectives, or desired health outcomes of medical treatments provided to patients. Typically, these objectives include the effectiveness of treatment such as patient recovery, restoration of function, or mortality.

During the last two decades, the quality of medical care in the United States has become an important social, political and economic phenomenon. Not only has health care affected the well-being and productivity of individuals and their families, stakeholders, and the society at large, it has also evolved into a heated issue which has impacted the outcome of political processes. Due to enormous cost and troublesome variance in the quality of service provided to

society, the future of health care has been universally perceived as one of the biggest challenges to the U. S. economy (Chassin, Loeb, Schmaltz & Wachter, 2010).

As previously stated, despite enormous expenditures, health care in the United States has underperformed relative to other developed countries (International Profiles of Health Care Systems, 2013). Specifically, studies comparing the effectiveness of healthcare systems in the world rank American health care in the bottom quartile among industrialized countries (Hussey, Anderson, Osborn, Feek, McLaughlin, Millar, & Epstein, 2004).

Research, one can surmise, points to serious shortcomings of healthcare quality in the United States. Due to problems with management of chronic care, coordinated care, safety and very high rates of medical error, it has become increasingly difficult for hospitals in the United States to meet accepted international standards of care quality (Commonwealth Fund Commission on a High Performance Health System, 2008). Awareness of this quality problem can be linked to research conducted by a number of institutions as the Institute of Medicine (IOM); The Agency for Healthcare Research and Quality; The Committee on Identifying and Preventing Medication Errors, and the Agency for Healthcare Research and Quality Research. By providing important statistics, the studies expose the magnitude of the quality of care problem. Consequently, annual deaths caused by medical errors committed in American hospitals reached as many as 98,000 per year (IOM, 1999). Infections acquired by patients during their hospital stay are ranked as the fourth overall cause of deaths in the country (McCaughey, 2008). Out of 1,500,000 preventable adverse drug events (ADEs) which occur in the United States each year, as many as 450,000 occur during hospitalization (The Committee on Identifying and Preventing Medication Errors Research, 2006). The estimated cost associated with each of such preventable ADE is about \$8,700 (Aspden, Wolcott, Bootman, & Cronenwett,

2007), cumulatively, these expenditures reach approximately \$4 billion per year (Bunting, Schukman, & Wong, 2010). Another important statistic pertains to incorrect treatments or procedures administered to patients, or operations performed on the wrong people. Misdiagnoses were attributed to approximately 80,000 annual deaths of hospitalized patients (Newman-Toker & Pronovost, 2009; Seiden & Barach, 2006). Overall financial costs of medical errors committed in the U.S. hospitals have been estimated at between \$17 billion to \$29 billion per year (Jha, Chan, Ridgway, Franz & Bates, 2009).

In summary, although the cost associated with health care in the United States is by far the highest in the world, the quality of medical care provided to Americans falls short of quality standards set by the international community. Furthermore, worrisome variance in the quality of care provided at hospitals across the country has been viewed as a critical problem of the American system (Agency for Healthcare Research and Quality, 2010; Dickey, Corrigan & Denham, 2010; Henriksen, Battles, Marks & Lewin, 2005). Not surprisingly, research on health care has long proposed that the problem of quality of medical care should be perceived as a critical factor jeopardizing the future growth of the U.S. economy (Centers for Medicare and Medicaid Services, 2012; Hussey, Anderson, Osborn, Feek, McLaughlin, Millar, & Epstein, 2004).

Healthcare innovation

When looking through the lens of solving organizational problems, the necessity to drive effectiveness and efficiency of business operations has been viewed by research as a main trigger of the process of innovation (Van de Ven, 1993; Rogers, 1983; Tolbert & Zucker, 1983). Schumpeter (1934) looks at this process in terms of an effort aiming to solve a problem created

by an economic disequilibrium. Not surprisingly, in order to solve problems associated with low quality of medical care, healthcare organizations have focused their attention on innovation. As a result, American hospitals have started to use healthcare innovation as a critical vehicle for organizational improvements (Avgar, Givan & Liu, 2010; Omachonu & Einspruch, 2010; Lansisalmi, Kivimaki, Aalto & Ruoranen, 2006; Aiken, Clarke & Sloane, 2002).

The literature defines innovation in terms of the application of new ideas, which aim to generate desired outcomes (Van de Ven, Polley, Garud, & Venkataraman, 1999), or, more specifically, as new processes, products, or procedures adapted by units to benefit individuals, groups, or society (West, 1990). The Agency for Healthcare Research and Quality (AHRQ) suggests that in the health care setting, innovation signifies the implementation of new ideas, processes, or systems that result in improved patient outcomes related to safety, effectiveness, timeliness, or efficiency, or results in patient care that is equitable and patient-centered (AHRQ, 2009). In accordance with this definition, empirical studies define healthcare innovation in terms of new services, processes, or products introduced in hospitals to improve the quality of medical care, safety outcomes, efficiency and costs of operations (Omachonu & Einspruch, 2010; Varkey, Horne & Bennet, 2008).

Herzlinger (2006) addresses healthcare innovation in terms of customer-based, technology-based, and integration-driven internal improvements. Customer-focused innovation aims to improve patient outcomes while lowering expenses and medical costs. Technology-based innovation improves the delivery of care resulting in new types of treatment, prevention of patient diseases, reduced delivery time of products and services, and improved quality of delivered product. Finally, integration-based innovation results in higher efficiency by improving workflow processes, streamlining operations among units, and eliminating operational

redundancies. Lansisalmi, Kivimaki, Aalto & Ruoranen (2006) describe healthcare innovation in terms of new forms of medical care delivery, new ways of patient care, or new technology utilized by healthcare organizations. This research emphasizes that healthcare innovation has significant economic potential, because such innovation yields operational improvements that may generate new economic rents while fulfilling changing customer expectations. Healthcare innovation becomes therefore a source of competitive advantage for early adopters, the organizations that are able early on to recognize its strategic importance.

Given the definitions developed by research, this dissertation defines healthcare innovation in terms of new products, services, or processes improvements that positively affect the quality of medical care provided to patients by emergency departments. Product innovation may refer to new services offered to patients; process improvements entail new methods of care delivery; while organizational improvements refer to the way in which organizational units are organized and cooperate. Many examples of healthcare innovation exist, which have positively affected the quality of care provided to patients. Among the most popularized are patient- and family-centered care (PFCC) and the patient safety check list. Other important examples include one-stop service, m-Health by mobile phones, patient home monitoring, or prevention of catheter-associated urinary tract infections (Centers for Medicare and Medicaid Services, 2012; Agency for Healthcare Research and Quality, 2009; Institute for Healthcare Improvement, 2008).

Patient- and family-centered care (PFCC) should be recognized as one of the most impactful healthcare innovations of recent years. Hospitals providing patient- and family-centered care aim to deliver medical care by reinforcing the importance of openness, information sharing, participation, and collaboration among all participants, such as doctors and medical staff, patients and the family members (Institute for Family Centered Care, 2009). Empirical

studies show the positive impact of PFCC on quality outcomes. This particular delivery method lowers the rate of medical error and increases the effectiveness of treatment, as it accentuates the importance of collaboration to address unique medical needs and preferences of each patients. Consequently, superior medical care can be provided when cumulative expertise and experience of all members of medical staff are fully utilized in order to identify and address specific medical circumstances (Avgar, Givan & Liu, 2011; Frampton & Charmel, 2008; Conway, Johnson, Edgman-Levitan, Schlucter, Sodomka & Simmons, 2006).

Another recent example of healthcare innovation is the surgical safety checklist (SSC). The introduction of this checklist has been linked to the improved effectiveness of communication among members of medical teams during the diagnostic and medical treatment stages of patient care. As a result of more formalized and better organized information sharing, fewer medical errors and fewer adverse patient outcomes are recorded in hospitals using the SSC (Institute for Healthcare Improvement, 2008). Research also accentuates the growing importance of general technological innovation which can be applicable in the medical setting. Early adaptation of such innovation helps to more quickly detect, diagnose and treat medical problems leading to improved quality outcomes and more affordable availability in terms of number of uses (Congressional Budget Office, 2008).

Performance of healthcare organizations

During the last two decades, the healthcare industry in the United States has become one of the most critical factors affecting the country's economy. Despite the highest overall, and the highest per capita expenditures, quality of medical care provided by the U.S hospitals is often substandard as compared to the quality of care provided by similar institutions in other

industrialized countries. Very troublesome variance in quality of care across American hospitals has been identified as a critical flaw of the system. Alongside world class hospitals recognized for its unparalleled quality of service, many hospitals in the United States significantly fall below quality standards accepted by the international community.

Inefficiency and ineffectiveness of the system—manifested by high costs and low quality of service—have created an important setting for research. Studies aiming to shed more light on the organizational dynamics in healthcare organizations are therefore deemed as both important and impactful. Research questions of “what organizational factors could explain variance in quality of medical care across emergency departments,” and, “how the quality of medical care provided by the American emergency departments can be improved in the future” carry a great deal of significance for the country’s economy, society at large, and individual patients.

In all industries, firms search for innovation to improve the efficiency and effectiveness of their operations. In the course of the last two decades, hospitals in the United States have begun a quest for healthcare innovation in order to reduce astonishing expenditures and improve quality of service. While focusing on the sources of variance in the quality of care provided by the U.S. emergency departments, the subsequent part of this dissertation investigates the antecedents of the process of opportunity exploitation. Consequently, it turns to entrepreneurial theory to examine why some emergency departments are more successful than others in finding new solutions that may translate into higher performance: higher quality of medical care provided to patients.

CHAPTER 4

NETWORK DIVERSITY IN THE CONTEXT OF FIRM PERFORMANCE

Current research posits that new opportunities can be created exogenously. This takes place when external forces generate disequilibrium in a market. New opportunities can also be created endogenously when a firm prompts internal searches for new solutions to existing problems. In either case, these new opportunities can be subsequently exploited upon the realization of their meaning and economic value. This process of exploitation can culminate in superior firm performance.

The process of entrepreneurship can depend on access to external information that will deliver critical signals of change occurring in the environment. New information coming into a firm may indicate the existence of new external opportunities that are ripe for discovery. It can also indicate a need to update existing stocks of organizational knowledge, which can prompt an internal search for improvements and thereby create new opportunities. In the following section, this dissertation investigates the importance of heterogeneity of external information, focusing on the role of social mechanisms that can facilitate access to such information.

According to the literature, social capital and networks are perceived as effective vehicles for individuals and groups to gain environmental resources including new information (Nahapiet & Ghoshal, 1998, Uzzi, 1997, Burt, 1992; Coleman, 1988, Bourdieu, 1986). Consequently, this chapter of the dissertation focuses on the role of social capital and external networks in the context of opportunity exploitation. Current research conceptualizes social capital in a rather general way, attempting to capture often intangible outcomes of social integration. Social capital is also defined in terms of resources resulting from the process of socialization during which norms and values shared by group members coordinate economic exchanges. This coordination

then leads to outcomes mutually beneficial to members of a given group. Social capital is therefore broadly viewed as any resources derived from social structure, while social networks are defined as structural vehicles that allow members to access and diffuse those resources.

Departing from the assumptions of neo-classical economics, research on social capital shows that members of networks who engage in economic exchanges are not exclusively driven by self-interest, but also consider the social impact of economic transactions on the groups to which they belong. Consequently, because economic choices are also driven by collective benefits, they may generate resources available to individuals and firms based on their network membership. As a result, firms belonging to external partnerships may be able to access resources that may not be otherwise available to non-members. These resources may include new information signaling the existence of new external developments.

Social capital and networks

The concept of social capital was introduced by French sociologist Pierre Bourdieu (1986) who points out that group membership generates access to resources available only to group members. Bourdieu defines social capital as “the aggregate of the actual or potential resources linked to possession of durable networks of institutionalized relationships of mutual acquaintance or recognition” (1986, p.248). This definition of social capital is very general, as it encompasses any resources derived from social relationships formed among individuals belonging to the same network. Bourdieu (1986) highlights that over time individuals continue to accumulate their unique personal capital and social capital comprises one of its dimensions. Together with cultural, economic and symbolic capital, social capital determines each person’s

access to resources within a social structure. Thus, variance in social capital can explain variance in the amount of resources that each individual can obtain.

Other definitions of social capital were later introduced. Coleman (1988) defines social capital in terms of *entities* residing in the structure of social relations among individuals. Social capital, Coleman (1988) asserts, is derived from fundamental outcomes of the process of socialization; these include obligations, expectations and the acceptance of behavioral norms. As agents develop a higher degree of trust and trustworthiness, their economic actions become less driven by a utility search, and more dependent on normative constraints. Putnam (1993) views social capital as an outcome of the process of organizing during which trust and reciprocity coordinate mutually beneficial economic exchanges among members of the same network. Nahapiet and Ghoshal (1998) define social capital as a composition of actual and potential resources that can be gained from a social structure. They, in turn, assert that "networks of relationships constitute a valuable resource for the conduct of social and economic affairs, providing their members with the collectively-owned capital" (p.250). According to Burt (1992) social capital is derived from connecting detached elements of a social structure by a unit with the ability to bridge such structural holes.

Common to the literature is the explanation of social capital in terms of communal resources, with networks viewed as mechanisms that permit the distribution of such resources among network members. Membership in a network can result in tangible economic gains as it provides members with resources that otherwise may be unavailable, or may be available at a different price. Not surprisingly, as network members obtain economic gains, they become incentivized to support their network and the other members of this network. Such growing support leads to a higher degree of bounded solidarity, mutual trust, and reciprocity among

members. This, in turn, promotes a collective motivation to reinforce group cohesiveness (Portes & Sensenbrenner, 1993).

While investigating why agents establish and maintain networks, Portes (1998) proposes some interesting explanations of how social capital can be generated. Expanding on the ideas introduced by Hobbes (1651), Portes (1988) distinguishes between under-socialized (instrumental) and over-socialized (value-introjected) provenances of social capital. The instrumental view assumes that social capital could be classified as a byproduct of self-interest, as networks are merely a structural vehicle created by individual participants to further their own individual agendas. This perspective is consistent with neo-classical economics and depicts networks as a product of the rationalization of economic benefits associated with network membership (Portes, 1998). The value-introjected perspective on social capital breaks, however, with the assumption that agents' rationality is the exclusive factor shaping their economic choices. Hence, a degree of congruence among values shared by agents will control to what extent individual or collective interests influence economic choices made during economic transactions. A higher congruence of values will reinforce the role of collective interest shared by members of a given group, while a lower congruence will enhance the importance of self-interest. Thus, by showing that economic choices among exchange partners are not exclusively driven by their self-interest, research on social capital establishes that economic transactions are rooted, or embedded, in the social context in which they occur (Granovetter, 1985).

When economic choices are made by participants embedded in a shared social context, such exchanges among individuals representing the same network should reduce the degree of opportunism during economic transactions. Thus, by lowering the governance costs of future economic transactions, networks can offer to their members some resources at a price different

than the price set by the market. Consequently, networks may become more efficient than the market in governing economic exchanges among agents socially embedded in the same social structure (Ouchi, 1979).

Networks and access to information

By rejecting the assumption that individuals do best for others when acting selfishly for their own interest (Smith, 1776), Granovetter (1985) shows that economic behaviors are rooted in the context of social relationships. When exchange partners realize the value of benefits associated with a partnership, they use the same partners for similar economic exchanges in the future (Kogut, Shan & Walker, 1992). Thus, participants of economic exchanges tend to develop preferences for dealing with the same established exchange partners or a trusted informant. This process leads to the development of a network form of organizing defined in terms of a collection of agents pursuing repeated and enduring exchange relations without a legitimate organizational authority to arbitrate and resolve disputes that may arise during such exchanges (Podolny & Page, 1998). For its members, this form of organizing can become more efficient than the market because it reduces environmental uncertainty and risk. Consequently, by lowering the price associated with a search for resources, networks allow agents to cope more efficiently with exogenous contingencies (Gulati & Gargiulo, 1999; Podolny & Page, 1998).

Research points out that the quality of relationships among network members can determine the flow of resources within a social structure (Smith-Doerr & Powell, 2005; Uzzi, 1997; Granovetter, 1995). While analyzing the role of networks in allocating various types of resources, Granovetter (1995) shows that the distribution of resources may be a function of the strength of social relationships. Granovetter (1995) illustrates this notion by showing that

stronger ties, such as those among family members, are more conducive to the generation of more tangible or material resources, such as money and other forms of general support. However, as a firm expands, it must also establish other essential connections with exchange partners in the environment; such connections tend to be weaker but are also more diverse. These weaker linkages between a firm and its task environment become very critical as they aim to produce new information. Smith-Doerr and Powell (2005) refer to such networks as information-oriented networks, pointing out that such networks are established primarily for the benefit of accessing novel ideas that can result in innovation.

Research shows that the strength of social relations will affect the diffusion of resources within a social structure. While stronger ties can generate the distribution of financial resources, weaker connections are perceived mostly as effective vehicles for permitting access to information. However, variance in the strength of ties connecting agents within a social structure can also affect the quality and utility of obtained information (Uzzi, 1997; Burt, 1992; Granovetter, 1985). Strong ties—those which denote a higher level of trust among agents—tend to solidify group social cohesion and prompt the development of a common identity that enhances a shared sense of group membership. These ties will therefore produce more “personal” or intimate information. A negative effect of strong relationships does, however, exist. The reinforcement of common understandings among network members can produce a strong group paradigm and result in information that becomes “recycled,” since it reflects commonalities shared by agents connected by strong ties. Consequently, strong ties can produce information that is redundant and unoriginal.

Weak ties signify connections among often remote agents representing otherwise disconnected groups that coexist within a social structure. Because such exchange partners

represent detached social groups, they may perceive social reality in noticeably different ways as their perceptions could have been influenced by radically different sets of values and norms shared within their respective groups. Due to these differences in the perception of social reality, information shared among partners linking or bridging disparate social groups will tend to be more superficial but also much less redundant. Diverse links between partners otherwise embedded in disparate parts of a social structure should be therefore viewed as more strategic, as they channel the flow of novel, non-redundant information that can be rich in new opportunities (Burt, 1992).

Many empirical studies investigate the role of strong and weak ties in the context of information sharing. Studies confirm that, by connecting partners from the same part of a social structure, strong ties will generate information that may otherwise be restricted to outsiders. This was found to be particularly beneficial in the context of transferring tacit, complex and non-codified knowledge. Information transferred via strong ties does tend, however, to be deprived of strategic novelty, or innovation potential. More open network connections based on weaker ties linking distinct groups do, on the other hand, permit access to newer information, as they bridge information sources representing a variety of disconnected social entities (Tiwana, 2008; Uzzi & Spiro, 2005; Levin & Cross, 2004; Adler & Kwon, 2002; Hansen, 1999; Burt, 1992).

Heterogeneity of networks and access to a diverse pool of opportunities

According to current research, network diversity can be achieved by establishing diverse connections with unique exchange partners, or with exchange partners who can bridge otherwise detached groups or parts of the environment (Goerzen & Beamish, 2005; Goerzen, 2001; Reagans & Zuckerman, 2001; Powell, Koput & Smith-Doerr, 1996). Given that access to novel

information is strongly linked to boundary spanning and the bridging of various societal groups, for the purpose of this dissertation *network diversity* is defined in terms of the number of inter-organizational ties with partners representing dispersed parts of social structure. It is assumed that these connections are established with the objective of obtaining strategically novel information that will signal new the process of external change. According to this definition, network diversity will be contingent on how dispersed a network is, and the number of partnerships established within otherwise detached groups coexisting in a social structure. The quantity of relationships with partners representing heterogeneity of the world, it is assumed, will be more instrumental in obtaining new information than the depth and strength of such relationships.

Research shows the critical role of variance in external connections that can bridge exchange partners representing different social groups. A broader variety of sources of knowledge has been found to generate access to more diverse types of information, which can result in the realization of a broader pool of opportunities (Gruber, MacMillan & Thompson, 2013). According to Burt (1992) entrepreneurs operating in diverse parts of the environment can rely on weak external ties as sources of diverse new information. Burt (1992) concludes that higher heterogeneity of such external contacts can result in “richer” information. This is the case because individuals who are able to bridge structural holes within a social structure are more likely to realize the increased number of opportunities, prompting more entrepreneurial activities. For example, while investigating the relationship between sources of new ideas and venture creation, Christensen and Peterson (1990) find that higher heterogeneity of social connections can increase the likelihood of a new firm creation. Woolcock (2002) suggests that groups should develop various configurations of bridging (heterogeneous) and bonding

(homogeneous) networks as such configurations may expand access to a greater variety of resources including information rich in opportunities. Similarly, McEvilly & Zaheer (1999) show that firms that are able to connect gaps between diverse agents can access more novel information residing within multiple networks. In their recent study, Gruber, MacMillan and Thompson (2013) look at diversity of knowledge and experience, as well as contact sources that a firm's founders possess. This may include knowledge derived from industries in which a person might have worked, diversity in a person's education, and a diverse pool of prior business contacts that a founder may have established in the past. The authors conclude that broader sources of external knowledge and experience of founders will be positively associated with a broader scope of opportunities that a firm is able to recognize and exploit.

Network diversity and performance

This dissertation proposes that a low degree of network diversity signifies a lower number of connections between a firm and its external partners representing disjoint parts of the environment. A low diversity of external connections should therefore generate less heterogeneous information, instead generating more homogeneous information that should signal fewer novel cues regarding environmental change. Thus, a low diversity of networks should reduce the level of heterogeneity, or "richness" of incoming information. Such information, limited in "richness" and complexity will be produced because more homogeneous exchange partners may share numerous similar cultural traits that will shape their understandings of social reality. Consequently, information shared among such partners who perceive the environment in a similar way should be more redundant, more homogeneous, and less "rich" in novel ideas. As a result, a lower level of network diversity should provide a firm with fewer signals of important

external developments that could be pertinent to a firm's operations. A low diversity of network connections, which reduces the scope of novel information, may therefore limit access to new opportunities. This consequently should decrease the number of identified and exploited opportunities, and, by the same token, should negatively affect a firm's organizational performance.

Conversely, a high degree of network diversity, or a high number of external partners representing disjointed parts of social structure, may facilitate the exchange of information among units who perceive social reality in strikingly different ways. Exchanges among diverse external partners may serve to produce a broader access to heterogeneous information; information that captures alternative, often competing social paradigms. This information—emanating from diverse sources—will be richer in novel ideas and may signal a broader scope of new opportunities that a firm could identify and exploit. Consequently, a higher degree of network diversity should result in positive organizational performance outcomes.

Very few empirical studies have investigated the link between network diversity, or group heterogeneity, and group performance. In their team-level analysis, Reagans and Zuckerman (2001) view network heterogeneity as the extent to which interactions among individuals are shaped by salient demographic categories. Their study shows a positive association between heterogeneity of exchange partners in groups and the level of innovation that these groups can generate. Furthermore, it establishes a positive causal relationship between demographic diversity, resources derived from the membership in social networks, and team performance. Narayan (2002) shows that variance in the diversity of external partners can lead to variance in economic performance, and proposes a scenario in which the diversity of network partners can result in positive economic outcomes. This process can take place when a unit is

able to expand the scope, or range, of its external networks beyond bonding capital shared among homogeneous partners within a group. To improve economic outcomes, a group should aim to enhance its so-called “bridging” connections, or heterogeneous connections that will link partners from diverse social groups. In their study of the bio-tech industry, Powell, Koput & Smith-Doerr (1996) investigate the role of heterogeneity of external alliance partners. The study defines the diversity of network ties as the number of ties (partners) in different categories (social groups) that a firm possesses. This study goes beyond access to information, as it focuses on a broader range of collaborative activities and resource (including information) sharing among small bio-tech firms. It is based on the assumption that external alliances can reinforce collaboration among firms by resource, technology, or product sharing (Gulati, 1998). Results confirm that biotechnological firms with more diverse alliance partners become more innovative; they therefore perform better than firms having less diversity in external partners. Powell, Koput & Smith-Doerr (1996) conclude that diverse networks serve as a platform to expand the scope of a firm’s internal activities as they increase the awareness of additional projects that might be undertaken by a firm in the future. Furthermore, diverse networks provide greater opportunity to refine organizational routines, which is positively linked to a firm’s performance.

Although some evidence suggests a positive effect of network diversity on performance, some studies find mixed evidence in this regard. Goerzen and Beamish (2005) investigate the impact of network diversity on the performance of multinational firms in Japan. Goerzen and Beamish (2005) measure the impact of diverse, inter-organizational links among geographically dispersed partnerships established at local, national and cross-industry levels. The empirical results regarding economic performance provide mixed outcomes, as both homogeneous and heterogeneous networks are found to be positively associated with a firm’s performance in

different contexts. The authors conclude that in the context of multinational organizations with a high level of product diversification, the cost of managing highly diverse ties may become too demanding. The curvilinear effect of network diversity on performance implies that for firms operating in a complex environment, it may become too expensive and difficult to develop and maintain a high level of network diversity, thus it can result in decreased benefits. Research confirms that the impact of collaborative effort on the performance of diverse partners may depend on the context and business objectives that members of a partnership aim to achieve (Ahuja, 2000).

In summary, this dissertation proposes that network diversity may provide an organization with performance benefits. Firms with homogenous external partnerships will reduce the likelihood of accessing heterogeneous information signaling the existence of alternative, competing perspectives. This will take place because the homogeneous external partners will tend to perceive environmental changes in a very similar way. In contrast, networks composed of highly heterogeneous exchange partners, representing heterogeneity of the world, should provide a firm with a broader scope of perspectives, thus presenting alternative ways of perceiving and reasoning. As such, more diverse networks may allow a firm to find out about a wider range of developments that their diverse external partners identify as relevant. These relevant developments may include unexpected changes in the markets, new sources of business financing, new technological advancements, or new trends emerging among customers.

This exposure to a wider scope of alternative approaches should allow a firm to expand the range of potential considerations regarding how internal problems should be analyzed and fixed. Consequently, by expanding the available repository of alternative approaches to internal issues, and by introducing novel framing of looking at existing problems, a more comprehensive

search for alternative solutions can be prompted. By gaining exposure to alternative viewpoints, a firm may become more aware of its path-dependent propensity to implement similar solutions. Breaking the competency trap could result in positive performance outcomes (Tushman & O'Reilly, 1997; March, 1991). Consequently, by breaking this established pattern, a firm should increase the likelihood of opportunity exploitation.

Network diversity and the performance of emergency departments

Existing research focuses mostly on the impact of external networks on a firm's performance in a broader context of resource sharing and collaboration among external partners (Ahuja, 2000; Gulati, 1998; Powell, Koput & Smith-Doerr, 1996). Only a limited number of empirical studies investigate the impact of network diversity, or diversity of external ties, on a firm's performance. These existing studies offer inconsistent results as they demonstrate that both more homogeneous and more heterogeneous networks may, at times, be positively associated with better economic performance (Goerzen & Beamish, 2005; Powell, Koput & Smith-Doerr, 1996). The existing literature implies therefore, that depending on the contextual settings, in which a firm operates and develops its external relationships, the benefits of network diversity can significantly vary. In a case of multinational corporations operating in the complex, global markets, the costs associated with establishing diverse partnerships may outbalance their benefits. On the other hand, in a case of smaller companies operating in one industry and one national market, heterogeneity of contacts can result in positive performance outcomes. Drawing from existing research, this dissertation aims to contribute to research by proposing a positive relationship between network diversity and the process of opportunity exploitations, resulting in superior performance of healthcare organizations in the United States.

Research has emphasized the economic value of asymmetric information existing in the environment (Hayek, 1945). Hayek's (1945) notion rejects the premise that perfect information is available to all. The author emphasizes that heterogeneous distribution of information in the environment can result in opportunities for economic gains. Entrepreneurial theory views opportunities as phenomena that can either be discovered or endogenously created (Alvarez & Barney, 2007; Shane & Venkataraman, 2000). When new external developments—technological, political or social changes—disrupt an existing economic order, such change can result in reallocation of existing resource, thus it can trigger the process of opportunity exploitation. Firms capable of successfully gaining access to information signaling external change also gain a major advantage over their competition, as such information allows them to initiate the process of opportunity exploitation. Newly exploited opportunities in the form of new products, services, or methods of organizing production should subsequently result in positive performance outcomes (Shane & Venkataraman, 2000).

Access to new information that is external and signals ongoing environmental change, can prompt the process of opportunity exploitation. Consequently, establishing connections between a firm and its external partners may play an important role in firm success, as it can provide a firm with a broader influx of heterogeneous information. Such a broader range of incoming information should be viewed as a critical organizational asset in health care.

Emergency departments that develop a higher heterogeneity of external networks should be well positioned to access more external signals regarding environmental change. Such signals may prompt entrepreneurial activities—the process of opportunity exploitation. This new information regarding external developments, which is acquired via external networks, can therefore result in new opportunities. Exploitation of such new opportunities in the form of

healthcare innovation should lead to improved organizational performance of emergency departments with stronger external networks.

Nonetheless, not all external information generated by network partners is equally valuable. Literature shows that new information that is non-redundant has higher economic value, as it can provide a broader scope of novel ideas (Uzzi & Spiro, 2005; Uzzi, 1997; Burt, 1992; Granovetter, 1973). For this reason, new information—for instance regarding the latest developments in information technology systems, new suppliers offering medical products at lower prices, new governmental regulations that may affect the industry, or information about more potent drugs that a pharmaceutical concern has just put on the market—will have much higher economic value than redundant, “recycled” information already known to all emergency departments. The literature links access to such non-redundant information to heterogeneity of external sources (Gruber, MacMillan & Thompson, 2013; Burt, 1992). Furthermore, the diversity of information sources has been linked to better performance outcomes because it enhances the scope of perspectives and problem solving capacities (Reagans & Zuckerman, 2001; Hargadon & Sutton, 1997), and generates a larger variety of identified opportunities (Gruber, MacMillan & Thompson, 2013).

When emergency departments successfully establish heterogeneous connections with a diverse pool of partners—external connections with partners representing dispersed groups (e.g. partners in Washington and Beijing)—such emergency departments should consequently receive “richer” more heterogeneous information than emergency departments that have established only homogeneous partnerships (e.g., only medical firms located in Central Illinois). Such “richer” information received from dispersed groups of partners located in different parts of a social structure should therefore signal a larger pool of new alternatives that can be used for healthcare

innovation. Given this assumption, this dissertation proposes that emergency departments with stronger network diversity access a larger pool of new opportunities. These new opportunities are exploited in the form of new services provided to patients, new technological systems used to process patient data, and more efficient ways of organizing work between a hospital's units. The process of opportunity exploitation should lead to more effective ways of delivering medical care to patients, and should result in superior performance of emergency departments with stronger network diversity.

Health care research posits that the performance of healthcare organizations should be measured by assessing the quality of medical care provided to patients (Agency for Research and Healthcare Quality, 2013; American College of Emergency Physicians, 2013). Such measurements typically include clinical outcomes of medical treatment, as well as subjective measurements including patient satisfaction with received service. Objective measurements of quality of care will differ depending on the context. In the case of emergency departments, for example, clinical measurements are expressed in terms of patients' waiting time for necessary medical services. This includes the length of stay at the emergency department associated with a given patient's medical diagnoses, the length of stay associated with conducting prescribed medical procedures, the length of the process of actual hospital admission, etc. As established by clinical standards, the higher waiting time for services provided at emergency departments indicates a lower quality of medical care rendered to patients of a given department (Agency for Research and Healthcare Quality, 2013; American College of Emergency Physicians, 2013).

Emergency departments with stronger network diversity should have a broader access to heterogeneous information that captures a wider range of new critical developments relevant to business operations in the medical field. Access to such broad external information may signal

alternative solutions with respect, for example, to new services offered to patients, or better methods of delivering medical care. This exposure to the wider scope of alternative approaches should allow emergency departments to expand the range of potential resolutions regarding how relevant medical care problems should be fixed.

Research establishes a positive association between network diversity and firm performance. The empirical studies, however, reveal inconclusive results, as they indicate that diverse connections may be too difficult to maintain for firms operating in the complex, global markets. Conversely, firms operating in smaller markets, such as, for example, one industry benefit from a high level of network diversity. Based on this assumption, this dissertation proposes that by generating a wider scope of alternative solutions to internal problems, stronger network diverse should increase the likelihood of opportunity exploitation among emergency departments in the United States. The process of opportunity exploitation should result in emergency departments with stronger network diversity providing a better quality of medical care to their customers. Thus:

Hypothesis 1: There is a positive association between network diversity and firm performance. Specifically, emergency departments with a higher level of network diversity provide a better quality of medical care as measured by clinical outcomes.

CHAPTER 5

ABSORPTIVE CAPACITY IN THE CONTEXT OF FIRM PERFORMANCE

Firms establish external ties with their environment to access novel information that, otherwise, may not be widely available. Consequently, when firms develop more heterogeneous connections, such links should facilitate a firm's access to a broader scope of heterogeneous information incoming from often disconnected parts of a social structure. "Richer," more heterogeneous information obtained from such dispersed partners may signal the existence of a broader range of external developments that could be critical to firm's operations, thus they may prompt the process of opportunity exploitation.

However, not all firms possessing highly developed network diversity will be properly equipped to take full advantage of a broad influx of novel ideas. Some firms may overlook many potential opportunities when they lack an internal cognitive capacity that would otherwise allow them to recognize the meaning and relevance of incoming information.

The human ability to process new information and recognize its consequences can differ substantially. Individuals who possess stronger cognitive abilities can more easily recognize the relevance of incoming information and realize how it can potentially affect their future existence. Upon recognition that new information signals change that can affect their well-being, such individuals will most likely make some necessary adjustments mandated by the change. Similar to differences between humans, the ability of firms to process information can also vary significantly across units. As elements of an open system, organizations receive a variety of different cues from their environment. Upon accessing new information, firms must utilize their internal processing capabilities in order to determine the meaning and potential internal utility of such information. This process basically aims to filter or separate irrelevant information from

information that could be essential to a firm's future. If recognized as valuable to internal operations, new information can be used to alter existing internal processes. Exactly for this reason, the development of strong internal processing capacity should be viewed as critical, as it may determine the scope of internal change.

External information can deliver a number of different signals. It can, for example, signal that new exogenous opportunities have already been created by external shocks and wait to be discovered and exploited. Such new information can also deliver a message that external developments, or a process of ongoing environmental change, may require that a firm reallocate its internal resources to become more competitive. New information, by exposing a firm to new alternative perspectives, may alter the way a firm views its internal operations. As a result, this update may prompt new internal searches for more efficiency, as such it can result in the creation of new endogenous opportunities.

Because firms differ in their internal processing capacities, *ceteris paribus*, the same piece of incoming information may convey completely different meanings to two organizations. Firms with weaker processing ability may find new information utterly irrelevant and will decide to reject it. Firms with stronger processing capacity, conversely, may recognize the relevance of the same exact piece of information finding for it many potential applications. Stronger processing capacity should therefore enable firms to realize the meaning and consequences of a broader scope of heterogeneous information. Firms with stronger internal processing mechanisms should be able to identify more potential applications for such information. This should consequently increase the likelihood of opportunity exploitation resulting in superior organizational performance.

Research has defined absorptive capacity as an ability to recognize the value of new information, assimilate it, and apply it to commercial ends (Cohen & Levinthal, 1990). Given the definition, this dissertation posits that absorptive capacity can fulfill the critical cognitive functions (recognition, assimilation, application) during the process of opportunity exploitation. Because firms with stronger absorptive capacity are better equipped to correctly comprehend the meaning and relevance of a broader scope of heterogeneous information, they should be able to exploit a greater number of new opportunities. Such firms should therefore be able to introduce more new products, services or new methods of organizing production resulting in superior performance by firms with stronger absorptive capacity.

Recognizing the relevance of environmental change

Drucker (1995) posits that knowledge has become the most significant organizational resource of all modern means of production. Teece (1998) describes knowledge as the main driver of economic growth in the modern economy. The ability to create new knowledge that generates uniqueness in organizational assets is widely accepted as one of the main sources of a sustained competitive advantage (Nonaka & Teece, 2001; Spender, 1996; Nonaka & Takeuchi, 1995; Penrose, 1959). Not surprisingly, the development of the processes that aim to integrate incoming information into existing organizational knowledge, and thus creates new value is widely recognized as a critical requirement for a firm's economic growth (Teece, Pisano & Shuen, 1997; Hamel, 1991; Prahalad & Hamel, 1990; Nelson & Winter, 1982).

The resource based view posits that a firm's competitiveness arises from heterogeneity of its internal resources, such as bundles of processes, systems, competencies, or human capital. Jointly, these resources generate a sustained competitive advantage as they become difficult to

imitate by other firms (Mahoney & Pandian, 1992; Barney, 1991, Wernerfelt, 1984). The knowledge based view can be recognized as an extension of this theoretical framework because the perspective identifies uniqueness of firm knowledge as a source of new economic value. Therefore, it posits that variation in the level of organizational knowledge across units explains variance in a firm's success (Teece, Pisano & Shuan, 1998; Grant, 1996; Spender, 1994; Hamel, 1994; Nelson & Winter, 1982). Consistent with this tenant, when continuously updated, internal stocks of knowledge could become a main source of a firm's sustainability and longevity.

Many taxonomies of knowledge exist, and all follow Polanyi's (1961) general conceptualization of knowledge as either tacit or explicit. Explicit knowledge is viewed as knowledge recorded and stored in recorded or formalized organizational routines, documents, manuals and other records. Tacit knowledge is less formal and includes shared understandings often embedded in an organizational social context, such as interactions and relationships among employees. Tacit knowledge can encompass many intangible factors including employees' opinions and intuitions. Tacit knowledge is essential in the process of establishing of a competitive advantage because it is highly context specific, and thus very difficult to others to imitate and exploit.

Expanding on Polanyi's model, Winter (1987) distinguishes four critical dimensions of knowledge: complexity (simple vs. complex), observability (observable vs. unobservable), codification (explicit vs. tacit) and process dependency (process independent vs. process dependent). Winter (1987) posits that these four dimensions may determine the process of knowledge creation and transfer. Knowledge that is explicit, simple, observable and process independent is much easier to transfer to another context, and utilize in any organizational setting. Knowledge that is tacit, on the other hand, may require stronger social mechanisms, as

such social mechanisms can induce a higher level of externalization of information (Nonaka, 1994). Given this assumption, a social contextual factor, such as social interactions, could play a critical role during the process of knowledge transformation and exploitation (Zahra & George, 2002).

Kogut and Zander (1992) claim that firms exist in order to create new value through the process of internal knowledge management. As new knowledge cannot be easily created, a firm must develop internal processes that will allow it to update knowledge by either utilizing a firm's own experience, or by learning from the experience of other firms. Internal coordinative processes can propel the continuous upgrade of knowledge via transfer, combination and conversion of new information that a firm recognizes as useful. Nonaka suggests that a firm creates new economic value when it fully utilizes, what he calls, "task-force organization enabling the continual development, accumulation and leveraging of knowledge" (1994, p.33). As a result, new information becomes integrated into existing stocks of knowledge, and a subsequent process of exploitation can begin (Nonaka, 1994; Kogut & Zander, 1992; Cyert & March, 1963). According to this perspective, when firms develop strong mechanisms that can integrate new information into existing knowledge, firms can generate superior performance. Moreover, during the process of integrating "the old and the new", a firm continuously increases its path-dependent ability to better comprehend and respond to future environmental changes. Such expansion could therefore increase the likelihood of opportunity exploitation.

Nelson and Winter (1982) describe the process of organizational change during which internal routines become upgraded. The process of updating knowledge with new incoming information constitutes, according the ongoing process of organizational evolution. Nelson and Winter (1982) compare firms to living organisms and changing internal routines to genotypes,

which continuously evolve upon receiving external information mandating such necessary adjustments. Consequently, the mechanism of organizational sustainability, according to Nelson and Winter (1982), is dependent on the ability to incorporate new information into the existing system. This process of internal change, prompted by incoming external cues, imitates the biological processes of natural selection during which species able to better recognize the importance of external stimuli can succeed, while species that fail to understand and adapt to the changing environment become extinct.

Grant (1997) describes the ability to create new value in terms of the knowledge integration processes. Successful integration of incoming information with existing stocks of knowledge determines the scope of new knowledge that a firm can exploit. Consequently, the effectiveness of such integrative processes will expand a firm's future ability to create new value.

New incoming information that signals external changes prompts the process of internal sense-making: a collective interpretation of meanings (Weick, 1995). This process of sense-making is critical in the context of internal allocation of firm's resources, because it determines the scope of actions that a firm can consider to attain its goals (Thomas, Sussman, & Henderson, 2001; Teece, 1998). As the level of knowledge can significantly vary across units, firms facing similar information, but possessing different "knowledge corridors" or "bounded rationalities" should differ in their ability to understand what the new incoming information actually signifies, and thus will differ in the scope of actions that they take (Gruber, MacMillan & Thompson, 2013; Simon, 1955; Hayek, 1945).

It follows that the existing level of knowledge will determine whether a firm can correctly comprehend or completely misunderstand the relevance of new external developments.

Without a correct understanding of what external changes signify to its future operations, a firm cannot initiate correct adaptive measures, and reallocate its resources to better cope with new external contingencies. Under such circumstances, a firm will most likely make wrong decisions which could lead to the misuse of internal, resources resulting in deteriorating firm performance. Consequently, the ability to correctly understand the meanings of incoming information and recognize how firm resources should be reallocated in response to external change should be viewed as fundamental to a firm's success.

In order to maintain a strong ability to correctly “read” the changing world—understand the implications of incoming information—a firm must continuously upgrade its existing stocks of knowledge. As exogenous shifts generate environment changes, the level of organizational knowledge cannot remain constant. When a firm fails to update its internal knowledge, its knowledge stocks can become obsolete, thereby reducing a firm's ability to comprehend the meanings of environmental expectations in the future. In turn, this miscomprehension may result in converting a firm's core competencies into core rigidities that will falter a firm's future operations (Leonard-Barton, 1992) leading to systemic failure that takes place when a firm's decisions are based on false assumptions about markets (Leonard-Barton, 1992; Nelson & Winter, 1982). When decisions regarding resource allocations are based on such wrong premises, a firm's strategy should become incongruent with environmental expectations resulting in a firm's demise. Conversely, when a firm develops an ability to correctly understand how external changes can impact internal operations in the future, a firm should respond by reallocating its resources in a way that increases the likelihood of creating new value. This process should result in superior firm performance.

In summary, research shows that variation in stocks of knowledge can explain differences in firm performance. A firm's ability to facilitate an ongoing process of new knowledge exploitation is a critical source of a sustained competitive advantage. Updated stocks of knowledge reveal a broader scope of alternatives, a firm can consider to improve the effectiveness of its internal operations. Furthermore, when continuously updated, broader stocks of knowledge can expand a firm's ability to correctly comprehend and capitalize on a broader scope of external contingencies in the future.

In the context of the process of opportunity exploitation, this dissertation proposes that a stronger ability to comprehend and capitalize on a wider range of heterogeneous ideas incoming from the world will increase the likelihood of opportunity exploitation. The higher likelihood of opportunity exploitation should lead to superior firm performance over time.

Absorptive capacity

To recognize how a broad array of external developments may be relevant to business operations, a firm must develop a strong cognitive mechanism that will enable the better comprehension of the meaning, value and internal consequences associated with such environmental changes. This mechanism may be conceptualized as bundles of dynamic capabilities enabling the process of knowledge exploitation. When continuously updated, the mechanism should allow a firm to initiate internal change in order to improve its effectiveness, and thus sustain a competitive advantage (Zahra & George, 2002; Teece, Pisano & Shuen, 1997; Kogut & Zander, 1992; Nelson & Winter, 1982; Penrose, 1959).

The mechanism that represent a firm's ability to exploit knowledge is path dependent and can be purposely strengthened (Zahra & George, 2002; Teece, Pisano & Shuen, 1997). Consequently, this dissertation posits, a stronger absorptive capacity should enable a firm to

more effectively exploit a given opportunities, increasing the likelihood of opportunity exploitation resulting in superior firm performance.

The concept of a firm-level capacity allowing to recognize value, absorb and exploit external information is not new (Penrose, 1959). However, the actual construct of absorptive capacity was introduced considerably later. Cohen and Levinthal's (1990) widely cited definition states: "*...the ability of a firm to recognize the value of new, external information, assimilate it and apply it to commercial ends is critical to its innovative capabilities. We label this capability as a firm's absorptive capacity...*" (Cohen & Levinthal, 1990, p.128). This definition emphasizes the distinctive functions of absorptive capacity: understanding the economic value of new information; integrating that new information internally to amend existing processes; and exploiting new processes to produce commercial gains. Cohen and Levinthal (1990) describe absorptive capacity as a cumulative, path-dependent and multilevel construct; it resides in formalized and informal idiosyncratic organizational routines, stocks of individual knowledge and experience, and collective knowledge developed by each organization.

Researchers have investigated the concept of absorptive capacity in a variety of contexts (Volberda, Foss & Lyles, 2010; Lane, Koka & Pathak, 2002). Scholars have loosely applied the definition introduced by Cohen and Levinthal, but they concur that a firm's absorptive capacity plays a critical role in the effective transfer, creation and exploitation of new knowledge (Todorova & Durisin, 2007; Van den Bosch, 1999; Lane & Lubatkin, 1998). Many attempts to reconceptualize the role of absorptive capacity have followed Cohen and Levinthal's (1990) seminal study. Dyer and Singh (1998), for example, focus on interactive processes, viewing them as primary mechanisms permitting knowledge integration and coordination. Dyer and Singh (1998) posit that the role of absorptive capacity can be enhanced, or hindered, by social

interactions in a firm, which may affect the information processing mechanisms among exchange partners. Van Den Bosch, Volberda, and De Boer (1999) describe absorptive capacity as a firm's ability to integrate some elements of new information with existing knowledge repositories. This ability generates new knowledge that will enhance a firm's transformational or combinative capacities. Lane, Koka and Pathak (2006) look at the relationship between absorptive capacity and learning processes happening across organizational units. The authors emphasize that absorptive capacity can be reinforced by interactive social processes resulting in the expansion of a firm's problem solving abilities.

Building on research on dynamic capabilities (Teece, Pisano & Shuen, 1997), Zahra and George (2002) proposed that absorptive capacity should be defined in terms of a firm's dynamic capabilities. While considering various stages in the process of knowledge creation and exploitation, Zahra and George (2002) describe absorptive capacity as an evolving set of organizational routines that aim to access, process and internally utilize external information. Zahra and George (2002) distinguish four sets of organizational routines responsible for acquisition, assimilation, transformation and exploitation of new knowledge. *Acquisition* is a firm's internal ability to remain sensitive to external information that may be critical to new knowledge creation. *Assimilation* refers to organizational routines and processes that enable a firm to analyze interpret and understand the value of new external knowledge. *Transformation* is the ability to update organizational knowledge by combining existing knowledge with the newly acquired, external information. The last element, *exploitation*, allows a firm to create new competencies by incorporating acquired and transformed knowledge into its processes and operations. Because absorptive capacity is path dependent and cumulative, each expansion of absorptive capacity leads over time to a broader accumulation of internalized, organizational

knowledge (Zahra & George, 2002). As described, the current literature provides various conceptualizations of absorptive capacity. Despite some definitional differences, all of the conceptualizations share some core commonalities. All definitions present absorptive capacity as mechanism residing in the formalized processes and routines that are shaped by a firm's experience.

As described by research, stronger absorptive capacity should increase a firm's comprehension of what a wide range of new information can signify in a specific context. Thus, it should be perceived as instrumental in the process of organizational "sense making." Because of this "sense making" function, absorptive capacity should allow the correct realization about whether or not new incoming signals should be classified as relevant or irrelevant to a firm's operations. As they can often misdiagnose new incoming information, firms with low absorptive capacity may tend to make many diagnostic errors. They may, for example, incorrectly conclude that new technological developments should be irrelevant to their future business operations. Consequently, a low level of absorptive capacity may increase the likelihood that a firm will overlook new opportunities to integrate such technological developments into their current operations. Mosakowski (1997) shows that firms with lower knowledge processing abilities can be less able to realize the value of new incoming information: "*...the decision maker may not know enough to estimate the costs of his ignorance. It will be difficult to evaluate knowledge for acquisition in the future without possessing this knowledge during the evaluation*" (Mosakowski, 1997, p. 437). Given this assumption, a lack of absorptive capacity or weak absorptive capacity could signify a higher level of a firm's "organizational ignorance."

Firms with greater absorptive capacity will not err as often during the cognitive processing aiming to diagnose the meaning of new information thus, they will correctly

comprehend the broader scope of external changes, as well as what it may signify to their business operations. Such firms will be able to base their decision making processes on correct assumptions about their environment, and devise accurate adaptive measures to amend their existing processes. This should lead to more efficient allocations of organizational resources and superior firm performance.

An important characteristic of absorptive capacity is that it is cumulative and path dependent. As such, it continuously expands the existing “base” of organizational knowledge. Current research views this feature as highly instrumental because a stronger knowledge base enables the successful integration of more new information in the future (Lane & Lubotkin, 1998; Mosakowski, 1997; Grant, 1997). Thus, when path-dependent absorptive capacity expands over time, it should increase heterogeneity of environmental developments that a firm will be able to correctly comprehend in the future. This could consequently open the door to the future discovery of a larger number of more heterogeneous opportunities. Additionally, by expanding the process of continuous organizational learning, stronger absorptive capacity can also prompt a broader range of new internal searches for more efficient allocation of organizational resources, consequently resulting in a broader range of newly created opportunities.

In sum, based on the existing literature, the dissertation assumes that absorptive capacity can enable a firm to exploit a broad scope of heterogeneous opportunities. Firms with greater absorptive capacity will consider a broader scope of fresh, alternative perspectives that may fundamentally challenge embedded assumptions and cognitive schemas that a firm has used in the past. Such broader exposure to new alternatives should prompt a firm to reconsider the effectiveness of its internal operations, thus a firm should more often initiate the process of

internal search for efficiency. This process could result in the exploitation of a larger number of new opportunities resulting in superior firm performance.

Absorptive capacity and opportunity exploitation

According to research, a firm's ability to accurately understand its task environment is critical as it allows the firm to take corrective adaptive measures that aim to reallocate its internal resources. This process of internal change amends the scope of a firm's business operations (Teece, 1998; Thompson, 1967; Penrose, 1959). Exposed to an abundance of external information, firms must develop internal processing mechanisms that will permit them to filter, or sort out, such incoming information. Stronger processing mechanisms will permit a firm to better understand nuances of incoming information, and then use only such information that may be critical to that firm's operations. Such information processing capacity may thereby determine whether or not a firm will be able to successfully exploit newly created knowledge in the form of new products or services. Given this assumption, this dissertation posits that greater absorptive capacity will increase the likelihood of opportunity exploitation resulting in superior firm performance.

Firms with lower absorptive capacity remain less sensitive to the value of signals incoming from the changing environment. Facing a wide range of heterogeneous information, they may misdiagnose numerous external developments, and therefore should be less likely to successfully respond to the process of external change. Consequently, lower absorptive capacity essentially limits a firm's ability to exploit new opportunities. This means that when faced with a wide array of new heterogeneous information, firms with lower absorptive capacity are more likely to make critical diagnostic errors (type 1 and type 2 errors); they wrongly categorize as

irrelevant those new ideas that could actually improve the effectiveness of internal operations, or decide to exploit opportunities that should not have been exploited because they result in financial losses. Failing to fully recognize potential applications of a wide scope of new information, firms with low absorptive capacity systematically overlook new opportunities to more effectively arrange their internal resources.

Firms with greater absorptive capacity remain more “sensitive” or “alert” to the process of environmental change. As such, they are ready to take advantage of a broader scope of new developments because they are better equipped to comprehend their internal implications. Firms with stronger absorptive capacity should therefore exploit a broader scope of exogenous opportunities. Furthermore, signifying organizational cognitive ability, greater absorptive capacity should allow firms to initiate a broader scope of internal searches for new problem solving alternatives, and consider such a broader scope of alternatives to improve internal operations. Consequently, greater absorptive capacity should increase the likelihood of creating a larger number of new internal opportunities. Given this assumption, greater absorptive capacity should enable firms to successfully exploit a broader scope of new ideas generating more new innovations. Consequently, greater absorptive capacity should increase the likelihood of introducing a wider range of new services, goods or methods of production resulting in superior performance.

Absorptive capacity and the performance of emergency departments

The literature describes absorptive capacity as a dynamic organizational capability enabling the process of knowledge exploitation. The positive association between absorptive capacity and performance takes place because absorptive capacity allows a firm to find internal

applications for new knowledge, which leads to more effective configurations of internal resources. Consequently, firms with greater absorptive capacity introduce more new products, services and processes resulting in superior performance (Todorova & Dursin, 2007; Hayton & Zahra, 2005; Zahra & George, 2002).

The literature establishes a link between absorptive capacity and firm performance (Volberda, Foss & Lyles, 2010, Zahra & George, 2002; George, Zahra, Wheatley & Khan, 2001). This positive relationship was also proposed in the context of health care, where absorptive capacity was depicted as a mechanism enabling firms to better cope with complex interdependencies and processes (e.g., Easterby-Smith, Graça, Antonacopoulou & Ferdinand, 2008). Based on the existing research, this dissertation proposes that, *ceteris paribus*, emergency departments possessing greater absorptive capacity can better reconfigure their internal resources in order to increase the effectiveness of their internal operations.

Greater absorptive capacity should allow a firm to initiate more internal searches for process improvements, find better alternatives to existing problems, and implement the best possible solutions among the sets of available alternatives that aim to improve internal operations. Conversely, firms with low absorptive capacity may tend to make numerous diagnostic errors, as low absorptive capacity will not allow them to correctly determine what actions they should take in order to improve their organizational effectiveness. Consequently, this dissertation posits that greater absorptive capacity should increase the likelihood of opportunity exploitation, resulting in superior firm performance.

The existing literature strongly suggests a positive association between absorptive capacity and firm performance. Applying this assumption to the context of health care, *ceteris paribus* greater absorptive capacity should increase the likelihood of opportunity exploitation

resulting in superior performance, measured by a higher quality of medical care provided to customers:

Hypothesis 2: There is a positive relationship between absorptive capacity and firm performance. Specifically, emergency departments with a higher level of absorptive capacity provide a better quality of medical care as measured by clinical outcomes.

Entrepreneurial capacity in the context of performance of emergency departments

Chapter II of this dissertation introduces the concept of entrepreneurial capacity. It suggest that a firm must develop a high level of entrepreneurial capacity in order to increase the likelihood of opportunity exploitation that will result in superior firm performance.

Entrepreneurial capacity is conceptualized in this study as the interaction between network diversity and absorptive capacity.

Existing research strongly suggests that absorptive capacity fulfills multiple organizational roles. The capacity allows a firm to realize the value of new information, merge it with existing knowledge, and exploit newly created knowledge to introduce new products, services, or methods of organizing (Cohen & Levinthal, 1990). When a firm develops a structural mechanism allowing a broad access to a wide range of heterogeneous information (network diversity), and, at the same time, develops strong absorptive capacity, such a firm should exploit more new opportunities resulting in superior firm performance. A firm with a high level of entrepreneurial capacity should exploit only those new opportunities that possess a high potential of creating new value. Consequently, a firm with greater entrepreneurial capacity

should decrease the likelihood of making costly diagnostic errors (type 1 and type 2 errors) resulting in economic losses.

Emergency departments that successfully develop a high level of absorptive capacity, but do not possess strong network diversity, may substantially limit their access to a broad scope of heterogeneous information. This limited influx of new information may significantly reduce the likelihood of opportunity exploitation. Conversely, a high level of network diversity coupled with a high level of absorptive capacity should significantly increase the likelihood of opportunity exploitation, resulting in superior performance. Given this assumption, this dissertation proposes that emergency departments with stronger entrepreneurial capacity will perform better than emergency departments with weaker entrepreneurial capacity.

External connections linking emergency departments with heterogeneous partners will allow such emergency departments to better infiltrate their environment. Consequently, they should learn more about all relevant aspects of external changes (e.g., new laws restricting access to some medications, technological advancements that may be pertinent to health care, or training seminars that may increase functional expertise of medical staff). Emergency departments with stronger entrepreneurial capacity will be better equipped to correctly anticipate the impact of new developments, and early on, undertake adaptive measures aiming to address emergent external contingencies. Consequently, stronger entrepreneurial capacity will allow emergency departments to better reconfigure their resources, when making adjustments is necessary. For example, new advancements in cloud technology may allow emergency departments to more quickly access medical records of their patients, by linking together various sources of external and internal datasets. Using such technological advancement in the healthcare setting may increase speed and accuracy of medical diagnosis, shortening the time associated

with waiting for medical services provided to patients. The introduction of new electronic devices can improve the process of information sharing among all important parties: medical staff, patients and their families. Consequently, such advancement should allow emergency departments to be more responsive and better address specific needs of each patients, and therefore provide a better quality of service.

Current research strongly suggests that a nexus of new information and an ability to understand its economic value results in the process of opportunity exploitation (e.g. Dencker, Gruber & Shah, 2009). It also suggests that external networks facilitate access to new information while absorptive capacity allows the exploitation of new information (e.g. Burt, 1992; Zahra & George, 2002). Given these assumptions, this dissertation proposes that the interaction of network diversity and absorptive capacity will increase the likelihood of opportunity exploitation resulting in superior firm performance. Thus, entrepreneurial capacity should be positively associated with the performance of emergency departments as measured by clinical outcomes of medical care:

Hypothesis 3: There is a positive relationship between entrepreneurial capacity and firm performance. Specifically, the interaction between network diversity and absorptive capacity is positively associated with a higher quality of medical care provided by emergency departments.

CHAPTER 6

CULTURE OF INNOVATION IN THE CONTEXT OF OPPORTUNITY EXPLOITATION

The process of opportunity exploitation is described as a nexus between a new opportunity and an endogenous cognitive ability to identify and exploit such an opportunity in order to create new value (Shane & Venkataraman, 2000). Given this framework, this dissertation has proposed that entrepreneurial capacity comprised of network diversity and absorptive capacity facilitates the continuous process of opportunity exploitation. Opportunity exploitation results in innovations, such as new products, services, or methods of organizing leading to superior firm performance. In the case of healthcare organizations, such firm performance can be measured in terms of quality of medical care provided to patients.

Investigating antecedents of opportunity exploitation, the literature postulates that the impact of contextual factors on entrepreneurial activities should be closely examined (Barney, Clark, & Alvarez, 2003; Shane, 2003). Contextual factors can impact the effectiveness of organizational processes because they shape employee attitudes and behaviors, thus determining the level of individual support for firm-level “global” variables (Kozlowski & Klein, 2000; Schuler & Jackson, 1987). When contextual factors support organizational level processes, such as the process of opportunity exploitation, they should elicit employee behaviors that aim to increase the effectiveness of this process.

Drawing from research on organizational learning, change and strategy (Barney, 1991; Dutton & Jackson, 1987), Chen (1996) conceptualizes the theoretical framework that aims to explain the key antecedents of organizational success in the competitive environment. Consequently, Chen distinguishes awareness, motivation and capabilities (the A-M-C framework) as the key components that a firm should develop in order to remain competitive.

The framework, suggests that awareness refers to a firm's ability to access critical information regarding the environment, motivation pertains to incentives that can increase the internal effectiveness, while capability entails decision-making processes that determine a firm's future resource reallocation. Building on the conceptualization proposed by Chen (1996), this dissertation suggests that a firm can successfully exploit new opportunities, when it develops a high level of network diversity (awareness), absorptive capacity (capability) and culture of innovation (motivation). Consequently, the dissertation proposes that a strong culture of innovation can increase employee engagement in behaviors supporting the process of opportunity exploitation, and thus can positively affect firm performance.

The literature views organizational culture as one of the most critical contextual factors, defining it as a set of collective assumptions learned and shared by employees, and considered as valid ways to perceive, think, and act in relation to organizational problems (Schein, 2004). Research proposes that firms should develop their unique cultures, uniqueness of culture can explain why some firms gain a competitive advantage (Barney, 1986). Such cultural heterogeneity across firms will be reflected in different sets of cultural values and norms accepted and supported among employees (Schein, 2004). Because, as suggested by DiMaggio and Powell (1983), cultural norms elicit normative pressure to comply, heterogeneity of cultural norms across firms should elicit heterogeneity of employee behaviors across firms. Based on this assumption, when a firm develops a culture mandating employee support for the process of opportunity exploitation, its employees should engage in individual behaviors supporting this process.

The link between organizational culture and the process of opportunity exploitation is justified in the following way. A firm's culture, defined by a set of norms, may mandate

employee behaviors aiming to support different sets of organizational objectives. When a firm develops stronger cultural norms, such norms should elicit stronger internal homogeneity among employee attitudes and behaviors aiming to support a firm's goals (Schuler & Jackson, 1987). When cultural norms aim to promote entrepreneurial processes, they should generate stronger employee engagement in employee behaviors supporting such processes. Research refers to such employee behaviors as employee innovative behaviors (Scott & Bruce, 1994).

Based on these assumptions, when a firm's cultural norms mandate stronger employee engagement in innovative behaviors, they should generate a higher level of individual behaviors supporting the process of opportunity exploitation. Namely, employees should become more involved in such behaviors as the search for new ideas, support for alternative way of thinking, open communication, or collective problem solving (Scott & Bruce, 1994). This dissertation proposes that stronger individual support for innovation should positively affect the role of entrepreneurial capacity in the process of opportunity exploitation, thereby resulting in superior performance. The following section of the dissertation investigates, therefore, the links between organizational culture and the two dimensions of entrepreneurial capacity in the context of opportunity exploitation.

Culture and entrepreneurship

Early definitions of culture focus on the construct's content and boundaries. These definitions strongly emphasize the role of socially constructed elements shared and supported among members of a given group. For example, English anthropologist Edward B. Tylor defines culture as a *whole*, the content of which includes belief, art, morals, law, custom, and other habits shared by members of a society (Tylor, 1871).

Later research takes a significant turn as it focuses on the linkage between common elements shared by members of a group and the impact of these elements on human attitudes and behaviors. Boyd and Richerson (1985) describe culture in terms of collective factors, such as common values and assumptions that influence attitudes and behaviors of individuals. Culture can therefore be viewed as a set of “taken for granted”, collective assumptions about reality that determine individual attitudes and behaviors and consequently regulates social interactions within a given social structure.

Cultural factors determine a wide range of human behaviors; they can also affect entrepreneurial activities. This has been proposed by Max Weber (1930), who posited that by generating variance in individualism, cultural factors legitimize human activities that can ultimately support or obstruct economic developments. Because cultural institutions shape human attitudes, behaviors and social interactions among individuals, therefore they can generate a stimulus for economic activities undertaken by individuals in order to create new value. Consequently, the Weberian perspective on entrepreneurship conjectures that individuals become entrepreneurs due to their compliance with isomorphic pressures created by sets of cultural norms and values prevailing in society.

Weber (1930) posits that the difference in entrepreneurial activities across groups can be explained by differences in socially constructed cultural values, such as frugality, asceticism, and “thrift” propensity. These socially constructed cultural norms delineate accepted attitudes and behaviors, and thus may entice members of some groups to become more involved in entrepreneurship, while mandating that other individuals refrain from such activities. Weber (1930) describes how cultural values, such as religion, could play a critical role in the emergence of entrepreneurship. For example, Protestants in France were historically involved in

entrepreneurship at a much higher rate than other religious groups. For the Jains, a religious group in India, entrepreneurship had become the only socially accepted form of employment; this was based on their collectively accepted understanding that other forms of employment activities could be linked in some ways to the destruction of life (Weber, 1930, reprinted in 1956, p. 199-204). Empirical studies confirm that some cultures, more than others, can encourage their members to value and pursue entrepreneurial activities. Thus, differences in values and norms can explain variance in the level of entrepreneurship across groups (Shapero, 1984).

Barth (1963, 1967) has described entrepreneurship as the phenomenon that takes place at an intersection between individual and group domains. By either encouraging or discouraging specific entrepreneurial behaviors among members of a society, cultural factors explain why some individuals become involved in entrepreneurial activities that aim to improve and transform their communities, while others will refrain from them. This nexus occurs due to socially embedded meanings, such as the meaning of value which determines individual choices aimed to maximize utility.

Scholars have strongly suggested that entrepreneurship should be viewed as a social phenomenon embedded in a specific cultural context. This relationship between cultural context and a level of entrepreneurial activities is critical because a cultural context may provide necessary legitimacy and justification for human activities resulting in the generation of new value (Morris & Schindehutte, 2005; Krueger & Brazeal, 1994; Van de Ven, 1993; Hartwell & Lane, 1991; Aldrich & Zimmer, 1986). Krueger and Brazeal (1994) write: “entrepreneurial activities are deeply embedded in a social context, often amid a web of human networks that are both social and economic” (p. 92). According to this perspective, institutional factors regulate economic behaviors because they create either favorable or unfavorable conditions for

entrepreneurial activities. Consequently, the cultural context can generate variance in the degree of legitimacy, social support and acceptance for economic activities that aim to generate new profits.

Cultural factors should affect the degree of support for entrepreneurial activities within a group because they shape individual perceptions, sense making and the development of shared cognitive schema accepted by members of a group (Davidsson, 1995). This process encourages the development of collective psychological traits which increase legitimization of entrepreneurship among members of a specific group. While investigating the impact of culture on entrepreneurial activities, House, Javidan, Hanges & Dorfman (2002) note that variance in cultural values results in variance in economic processes that mandate economic behaviors. Cultural values and assumptions may affect the formation of processes and practices within a society by standardizing how members of a given group believe “things should be done”. By defining how individuals interpret their reality, and by regulating what behaviors are viewed as legitimate, cultures act as catalysts that enhance variance in entrepreneurial activities across groups. The empirical literature shows that differences in cultural traits, such as risk seeking, individualism and collectivism, power distance, or uncertainty avoidance can *ceteris paribus* explain variance in entrepreneurship at the group level (Freitag & Thurik, 2010; Audretsch, Grilo, & Thurik, 2007; Chrisman, Chua & Sharma, 2005; Thomas & Miller, 2000; Inglehart & Baker, 2000; Davidsson & Wiklund, 1997; Shane, Venkataraman, & MacMillan, 1995; Morris, Davis, & Allen, 1994; Shane, 1993). Such cultural differences can therefore affect the process of opportunity discovery and creation, because they shape unique understandings, “alertness”, or collective perceptions of how existing reality can be improved.

In summary, entrepreneurial activities are embedded in a social context and as such are determined by cultural norms, values and understandings shared by members of a given culture. Therefore, entrepreneurial activities could be viewed as shaped by isomorphic pressure, as they can thrive only when cultural understandings legitimize them by encouraging and rewarding entrepreneurship. This suggests that more entrepreneurial activities should be expected among individuals representing groups in which cultural understandings provide stronger legitimization, acceptance and support for entrepreneurship.

Organizational culture and performance

Research presents organizational culture as a cohesive organizational structure of social meanings rooted in unique sets of values, beliefs and assumptions. Organizational culture is also defined in terms of shared values, norms and understandings developed, accepted and supported by employees (Schein 2004, 1998).

Harrison and Stokes (1992) posit that organizational culture represent to an organization what personality signifies to people. Slezzer and Swanson (1992) view organizational culture in terms of individual and group behaviors which collectively determine how “things are getting done”. The authors propose that a definition of organizational culture can encompass three critical dimensions: structural, constructions and linguistic. The meaning of culture based in structural realism defines organizational culture as one of numerous unique properties of an organization representing a form of social organizing The social constructionist approach emphasizes that reoccurring social interactions in a given context may determine which set of common experiences will be turned into cultural understandings. According to this view an organization can be perceived as an evolving set of changing cultural norms. The third

perspective treats organizational culture as a linguistic construct which aims to serve the heuristic purpose of helping employees to develop and use some accepted patterns of thinking and acting.

Schein (1996) defines organizational culture as “the set of shared, taken-for-granted implicit assumptions that a group holds and which determine how it perceives, thinks about and reacts to its various environments” (1996, p. 236). Ravasi and Schultz (2006) conceptualize organizational culture as shared mental assumptions that regulate those employee behaviors deemed as appropriate in a given context. Thus, while describing organizational culture, research reinforces the linkage between normative obligations defining expectations of employee behaviors in a given organizational context and actual employee behaviors aiming to support organizational objectives. Based on current research, organizational culture is defined in this dissertation as a set of cultural understandings shared and supported by employees, which shape employee attitudes and induce employee behaviors that aim to support attainment of a firm’s goals.

A positive association between organizational culture and firm performance has been theorized and empirically tested (Schein, 2004; 1996; Hunt & Levie, 2002; Detert, Schroeder, & Mauriel, 2000; Barney, 1986). Research proposes that organizational culture should be viewed as a source of competitive advantage because variation in cultures across firms can explain differences in firm performance (Barney, 1986). In his early analysis, predating the conceptualization of the resource based view framework, Barney (1986) suggests that firms can reinforce heterogeneity of their internal resources by establishing a culture, which is valuable, rare and difficult to imitate by competition. Every firm must, therefore, make an important strategic decision aiming to establish its own, unique set of norms that will construct a firm

specific, difficult to imitate social context. Creating an appropriate organizational culture is essential because the right type of culture can allow a firm to attain its strategic objectives. Due to causal ambiguity and path dependency of mechanisms forming cultural norms and understandings, a unique organizational culture will be fundamentally unattainable to competitors, and therefore may provide a firm with a sustained competitive advantage.

The literature theorizes the mechanisms that would justify a positive link between culture and firm performance, suggesting that culture may generate superior firm performance when it influences individual employees to act in a manner instrumental to the attainment of a firm's objectives (Schein, 2004; Barney, 1986). Research proposes that a culture can result in superior economic outcomes when it defines a set of distinctive socially embedded understandings delivering a clear cohesive message of behavioral expectations (Schein, 2004). When accepted by employees, normative expectations induce employee compliance manifested in engagement in behaviors supporting firm's practices. When firm's goals become widely supported by employee behaviors, they lead to superior performance outcomes (Schuler & Jackson, 1987).

Cultural understandings embedded in social contexts produce desired behaviors due to isomorphic pressure (DiMaggio & Powell, 1983). Shared among employees, socially embedded normative understandings promote the development of context specific interpretations of meanings, thus they generate "interpretive schemas", or "cognitive maps" representing a collectively acknowledged understanding of the world (Weick, 1995; Falcione & Wilson, 1988). Strong cultural norms can therefore effectively act as inherent governance mechanisms, as they prescribe and control how individual understand and execute their own roles in the organizational context.

When a culture is strong, “cognitive maps” defining collective understandings become strongly supported among employees. This process further reinforces the grip of “iron cage”—isomorphic pressure to comply (DiMaggio & Powell, 1983). Over time, such social understandings prescribed by cultural norms should effectively amend or even replace how individuals understand their environment and their own roles in this context, thus, they turn individual “bounded rationality” into collectively determined interpretations. Thereby, normative isomorphism effectively reduces employee’s ability to remain “free” of behavioral expectations, mandating what behaviors are “not allowed” by cultural norms. Thus, such isomorphic pressure channels employee engagement and effort into activities that are prescribed by culture.

Isomorphic pressure increases employee motivation, commitment and engagement in activities supporting organizational objectives; individuals begin to perceive that their behaviors are necessary for a firm’s success (Hartmann, 2006). Stronger normative pressure induces stronger compliance of individuals with their prescribed roles (Thomas & Anderson, 1998; O’Reilly & Chatman, 1996; DiMaggio & Powell, 1983). When employees become highly motivated and engaged in behaviors supporting firm’s objectives, firms can derive economic benefits because of activities supporting organizational goals (Schuler & Jackson, 1987; Barney, 1986). Because the process, spurred by normative isomorphism, imposes the patterns of roles and scripts that individuals accept as their own, it effectively generates a higher level of homogeneity of employee behaviors. Such homogeneity among employee behaviors, when directed into activities supporting the process of opportunity exploitation, should positively affect firm performance.

In summary, through isomorphic pressure, firms can channel employee effort into activities that support their goals. Consequently, cultural norms induce homogeneity of employee

behaviors that aim to reinforce critical organizational paradigms. When socially embedded cultural meanings deliver a clear message of behavioral compliance, it generates individual behaviors supporting organizational processes and routines. When a firm's strategy prescribes innovation as a key objective, normative isomorphism will direct employee support into a set of innovative behaviors supporting the processes of opportunity exploitation.

Organizational culture and innovation

Cultural norms generate isomorphic pressure that can be used to channel employee efforts into activities supporting the attainment of a firm's goals. Isomorphic pressure is therefore used to regulate individual behaviors and interactions among employees. When strong, socially embedded cultural meanings will generate strong behavioral compliance among employees, which should consequently result in high homogeneity of employee behaviors within a firm. Such homogeneity of employee behaviors should support the attainment of a firm's prescribed objectives. For firms that establish innovation as a key paradigm, normative isomorphism may elicit that employees become engaged in innovative behaviors promoting the process of opportunity exploitation. This dissertation theorizes that stronger employee engagement in innovative behaviors will positively affect the relationships of the two dimensions of entrepreneurial capacity and firm performance.

Research suggests that cultural norms can play a key role in encouraging entrepreneurial activities within a firm (Zahra, Hayton & Salvato, 2004; Barney, Clark, & Alvarez, 2003; Detert, Schroeder & Mauriel, 2000; Von Hippel, Thomke & Sonnack, 1999; Van de Ven, 1993). Van de Ven (1993) describes a culture promoting innovation as sets of collective understandings encouraging employee creative thinking on daily basis. Consistent with research, this dissertation

defines culture of innovation as a set of shared normative understandings aiming to elicit employee engagement in behaviors supporting the process of opportunity exploitation.

A culture promotes innovation when it creates behavioral expectations that employees will engage in activities supporting the process of innovation (Zahra, Hayton & Salvato, 2004; West & Anderson, 1996; Scott & Bruce, 1994). West and Anderson (1996) write about “the expectation, approval, and practical support of attempts to introduce new and improved ways of doing things in the work environment” (West & Anderson, 1996, p. 686). When a firm creates a strong cultural norm endorsing innovation, such a culture should impose strong isomorphic pressure on employees to engage in behaviors viewed as “innovative.” Scholars have hypothesized the positive link between individual innovative behaviors and the process of innovation (Howell, 2005; West & Anderson, 1996; Scott & Bruce, 1994). Howell writes that innovation cannot succeed without “individuals who informally emerge to promote the idea with conviction, persistence, and energy, and willingly risk their position and reputation to ensure the innovation’s success” (2005, p. 108). Scott and Bruce (1994) also investigate individual level predictors of innovation, recognizing employee innovative behaviors are critical factors affecting the process of innovation. Scott and Bruce (1994) distinguish the elementary groups of employee behaviors—which the authors categorize as “innovative”—employee behaviors that a firm should encourage to enhance its innovative capabilities. These include: (1) behaviors focusing on a search for novel alternative solutions to already identified problems; (2) behaviors aiming to promote new alternatives and build collective support around new ways of thinking within a firm; and (3) behaviors aiming to explain how new alternative idea can be actually applied to improve firm’s operations. Similar to Scott and Bruce’s (1994) categorization of innovative behaviors, other researchers also identify collaborative problem solving effort, support for novel

ideas, open communication and information sharing as critical innovative behaviors (Zahra, Hayton & Salvato, 2004; West & Anderson, 1996). Building on research findings, this dissertation investigates the role of culture of innovation, namely employee innovative behaviors, in the context of opportunity exploitation.

Van de Ven (1986) explains that a firm should promote innovation among employees by encouraging employees to break their behavioral routines that are detrimental to innovation. Over time, employees tend to develop behavioral routines, often losing awareness that things could be done in some alternative ways. It is, therefore, up to a firm to encourage employee engagement in a search for new alternative solutions and novel ways of performing tasks, challenging established processes. Thus, by inducing normative pressure, strong cultural norms could effectively promote innovative behaviors aiming to challenge existing processes.

Shared cultural understanding may increase frequencies of collaborative exchanges among employees, and may increase collaborative effort supporting innovative outcomes (Hartmann, 2006; Kogut & Zander, 1996). Cultural understandings can endorse exchanges of ideas enabling the development of stronger knowledge capital (Detert, Schroeder & Mauriel, 2000). By promoting employee engagement and collaboration, cultural norms can encourage learning behaviors (Cameron & Quinn, 1999; Kimberly & Evanisko, 1981). Based on these research findings, when cultural norms endorse innovation, they should increase employee behavioral compliance positively affecting the processes of dissemination of new ideas, communication, learning and creation of new knowledge. Such innovative behaviors should consequently reinforce the formalized mechanisms responsible for the process of opportunity exploitation.

Strong cultural norms allow a firm to establish support for common goals and lead to the development of collective identity (Schein, 2006; Hedlund, 1994). Collective identity shared among employees increases the level of cohesion, collaboration and trust among employees (Rousseau, Sitkin, Burt & Camerer, 1998). Stronger trust among employees increases a firm's ability to process, transform and externalize information (Szulanski, 1996; Nonaka, 1994). Consequently, cultural norms promoting innovation should increase the effectiveness of the mechanisms responsible for information dissemination and knowledge creation.

Based on current research, this dissertation proposes that a firm can create normative pressures that will channel employee engagement into activities supporting the process of opportunity exploitation. Stronger cultural norms endorsing innovation should elicit stronger employee engagement in such innovative behaviors as collective problem solving, open communication, support for new ideas, and a search for alternative solutions. Consequently, this dissertation hypothesizes that a high level of employee innovative behaviors will positively moderate the relationships between network diversity and performance, and absorptive capacity and performance. Furthermore, the dissertation also proposes that the three way interactive effect of network diversity, absorptive capacity, and culture of innovation will be positively associated with the process of opportunity exploitation resulting in superior firm performance.

Culture of innovation and network diversity in the context of the performance of emergency departments

Research has largely neglected the relationship between external networks and organizational culture. In a theoretic analysis, Noorderhaven, Koen and Beugelsdijk (2002) propose that variance in organizational culture could explain differences in the quality of inter-organizational partnerships. The authors suggest that when a firm develops an internal culture

that aims to encourage employee engagement in effective communication, joint solving of problems and collaborative relationships, such a firm should increase its ability to develop good quality partnerships with external partners.

In an empirical study, Beugelsdijk, Koen and Noorderhaven (2006) propose that because organizational cultures tend to be very stable, their core elements such as prevailing values and norms should strongly encourage or discourage the firm's ability to develop external relationships over time. This study demonstrates that organizational culture promoting openness to new ideas, effective communication, and collaboration among employees can be positively associated with a firm's propensity to establish and foster external partnerships, which is labeled by the authors as the skill to form external relationships.

Thus far, to the extent of my knowledge, no empirical studies have proposed and tested the relationship between network diversity and culture of innovation in the context of the opportunity exploitation. Network diversity is defined in this dissertation in terms of the number of external ties between a firm and its partners representing external heterogeneity of a social structure. Culture of innovation, on the other hand, refers to the set cultural assumptions that induce employee innovative behaviors such as search for new ideas, open communication, and collaborative efforts.

As hypothesized in Chapter 4, diversity of exogenous connections should produce access to more heterogeneous information reflecting a broader scope of alternative perspectives and viewpoints. Such "richer," more heterogeneous information can allow a firm to access a broader range of novel solutions to existing organizational problems, consequently resulting in a higher number of exploited opportunities and superior organizational performance.

Research shows that organizational culture sanctions employee behaviors in which the shared norms and values become embedded (Katz & Kahn, 1978). Consistent with this notion, due to heterogeneity of values and norms across firms, organizational cultures should induce heterogeneity of employee behaviors. When a firm establishes a culture promoting innovation, it reinforces behavioral expectations that openness to new ideas, wide information sharing among individuals, as well as collaborative efforts among employees are expected. Such stronger culture of innovation should therefore generate stronger homogeneity of employee innovative behaviors within a firm. By reinforcing open communication, and by mandating employee openness to heterogeneity of novel ideas, stronger culture of innovation should positively affect the role of network diversity in the process of opportunity exploitation.

Stronger network diversity produces a broader scope of diverse external information. When a firm obtains access to such a broad pool of heterogeneous information, newly acquired ideas should be internally disseminated in order to initiate the process of opportunity exploitation. According to the existing research, organizational culture of innovation increases employee engagement in open communication (Zahra, Hayton & Salvato, 2004; Long & Fahey, 2000). Thus, it should reinforce effective dissemination of information within a firm. Furthermore, culture of innovation also encourages employee openness to alternative way of thinking (Scott & Bruce, 1994). Such openness, or support for alternative ways of thinking among employees should allow a firm to disseminate a broader scope of heterogeneous ideas received from external partners. As a result, new heterogeneous information should be better disseminated among organizational units, ensuring that all critical functions gain access to all relevant information that they may need. When such organizational functions have access to a broad scope of relevant information, the scope of novel ideas that a firm can use to improve its

internal operations should significantly increase. Consequently, the number of opportunities that a firm can exploit should also be higher. Based on this assumption, stronger culture of innovation should reinforce the positive effect of network diversity on the process of opportunity exploitation.

The positive moderating effect of culture of innovation on the relationship between network diversity and performance can be justified in the context of health care. When emergency departments develop a higher level of network diversity, they should be able to access “richer,” more heterogeneous new information signaling a broader range of external developments (technological, regulatory or managerial) that may be pertinent to internal operations of healthcare organizations. At the same time, when such emergency departments establish stronger culture of innovation, such a culture should induce more innovative behaviors supporting the dissemination of new heterogeneous ideas. Stronger culture of innovation should therefore positively affect the process of internal information dissemination, furthermore, it should also positively affect the scope of information disseminated within an emergency department. The interaction between a high level of network diversity and a high level of culture of innovation should allow emergency departments to exploit a higher number of new developments that may be used to improve their internal operations. This process should consequently result in superior quality of medical care provided to patients, when emergency departments introduce more effective work related practices, more effective technologies retrieving patient’s medical records, or they more effectively collaborate with patients’ families to better identify patient’s critical needs. Such improvements should reduce wait time for necessary medical services, reduce the number of misdiagnoses, and reduce the number of wrong treatments prescribed to patients.

The current literature theorizes a positive relationship between organizational culture and the firm's ability to establish external partnerships (Beugelsdijk, Koen & Noorderhaven, 2006). Nonetheless, the relationship between network diversity and culture of innovation in the context of opportunity exploitation has not been proposed. Current research suggests a positive role of a broad influx of new heterogeneous information on the process of opportunity exploitation. Building on this assumption, this dissertation proposes that when a firm obtains a broad range of new information via diverse networks, such new information will be better internally disseminated within the firm possessing stronger culture of innovation. Culture of innovation elicit employee engagement in innovative behaviors, such as open communication or joint problem solving. Because of employee engagement in these behaviors, newly obtained information regarding relevant developments (e.g., technological advancements improving the accuracy of medical diagnosis), should reach all organizational units that may need this information, thus increasing the likelihood of opportunity exploitation. Consequently, it should positively affect the overall quality of medical care provided at emergency departments:

Hypothesis 4: There is a positive interactive effect of culture of innovation and network diversity on firm performance. Specifically, the interaction between culture of innovation and network diversity is positively associated with a higher quality of medical care provided by emergency departments.

Culture of innovation and absorptive capacity in the context of organizational performance of emergency departments

Research defines organizational culture as a set of assumptions learned and shared by employees. When internalized and supported by employees, these collective understandings

elicit behavioral expectations, thus determining how employees perceive, think and act in relation to organizational problems. Culture of innovation is defined in this dissertation as one that creates normative pressure eliciting employee innovative behaviors that aim to support the process of opportunity exploitation.

Absorptive capacity is defined in terms of a firm's cognitive ability, the path dependent processes that allow a firm to comprehend the meaning, value and internal consequences associated with the process of external change. In response to changing contingencies, absorptive capacity facilitates the internal process of innovation by prompting reconfigurations of core organizational resources (Todorova & Durisin, 2008; Zahra & George, 2002; Cohen & Levinthal, 1990).

In their seminal study, Cohen and Levinthal (1990) point out that the relationship between absorptive capacity and innovation may be influenced by a firm's "shared language and symbols" (Cohen & Levinthal, 1990, p. 133). Zahra and George (2002) further advance this notion by suggesting that the development of strong social mechanisms may be necessary to enhance the positive effect of absorptive capacity on innovation. The positive effect of social factors on the relationship between absorptive capacity and innovation takes place, according to Zahra and George, because social factors prompt knowledge sharing processes, and enable effective knowledge transformation—a merger of incoming information with existing organizational knowledge. Consistent with these assumptions, a culture that induces employee behaviors supporting the process of innovation should reinforce the role of absorptive capacity during the process of opportunity exploitation. This positive effect of cultural norms on the process of opportunity exploitation, this dissertation posits, takes place because employee engagement in innovative behaviors, such as open communication, new ideas sharing and

collaborative effort should reinforce the processes of knowledge transfer, creation and exploitation. Consequently, the dissertation proposes a positive moderating effect of culture of innovation on the role of absorptive capacity in the process of opportunity exploitation.

The link between a firm's culture and absorptive capacity, or the relationship between innovative behaviors of individuals and the knowledge processing mechanisms has not been sufficiently examined (Van Wijk, Jansen & Lyles, 2008). While describing this association, Harrington & Guimaraes (2005) define absorptive capacity as a firm's capability to generate innovation, whereas culture of innovation is defined as the set of normative understandings regulating employee behaviors and attitudes toward the process of organizational change. The authors conclude that "knowledge friendly" cultures promoting internal flexibility and communication among employees can positively affect a firm's absorptive capacity.

The concepts of culture of innovation and absorptive capacity may be viewed as interlinked or interdependent, because cultural norms could effectively impact how all organizational mechanisms, including absorptive capacity, are designed and how they operate in practice. In this dissertation to make a clear distinction between the concepts, absorptive capacity is viewed in terms of more formalized or codified firm-level practices and processes aiming to create and exploit new knowledge (e.g., a weekly staff meeting for representatives of different departments). Conversely, culture of innovation is viewed as a set of normative understandings that aim to encourage employee support for such organizational practices and processes (e.g., employees voluntarily providing feedback regarding issues that should be raised during such staff meetings).

In their analysis of absorptive capacity, Van den Bosch, Volberda and de Boer (1998) suggest that knowledge absorption processes can be enhanced when a firm develops strong

coordination and socialization capabilities. The authors point out that coordination capabilities are dependent on relational capital: stronger relationships among employee can increase the process of knowledge creation. Socialization capabilities are reinforced by shared ideology and collective meanings and can be used to direct employee engagement into actions supporting the knowledge absorption processes.

Davenport, DeLong and Beers (1998) look at the effect of “learning cultures,” while exploring factors that can affect the organizational knowledge management processes. The authors posit that cultures encouraging learning processes are instrumental in finding better applications for new knowledge, because they enhance communication channels among individuals and groups. In their study, Lane and Lubotkin (1998) identify socio-cultural factors, such as organizational “dominant logic” as an essential factor affecting the processes of knowledge exploitation. The authors point out that these rooted in social context, knowledge transformation processes can be endorsed or hindered by social interactions among employees.

Shared cultural understandings can induce employee innovative behaviors affecting the process of innovation (Zahra, Hayton & Salvato, 2004; Quinn, 1988). Innovative behaviors, such as collaboration and communication are essential during the process of tacit knowledge externalization that enhances the processes of knowledge transfer (Nonaka & Takeuchi, 1995; Nonaka, 1994). Open communication and collaborative effort are necessary to prompt the process of “knowledge spiral” which becomes the foundation of the process of innovation (Nonaka, Toyama & Konno, 2000).

Collaborative efforts, willingness to share information and a search for joint solutions enable transfer of organizational knowledge (Tsai, 2000; Hansen, 1999; Zander & Kogut, 1996; Szulanski, 1996; von Hippel, 1994). Stronger collaborative efforts result in more effective

knowledge management processes, contributing to the process of dissemination of “necessary” new knowledge to all organizational units that need such access (Davenport & Prusak, 1998). Conversely, insufficient communication, lack of collaboration or motivation to share information, as well as fear of sharing relevant information are viewed as critical detriments hindering the process of knowledge creation (Easterby-Smith, Lyles, & Tsang, 2008; Szulanski, 1996).

In summary, the existing research proposes that normative pressure can induce innovative employee behaviors. Such innovative behaviors including collaborative effort, search for new ideas, or open communication, have been widely linked to various stages of the process of knowledge creation and exploitation. Research identifies absorptive capacity as the key organizational mechanism facilitating the processes of knowledge creation and exploitation. Consequently, given the presented assumptions, this dissertation proposes that when a firm establishes a culture of innovation eliciting employee innovative behaviors, such a culture should reinforce the positive role of absorptive capacity during the process of opportunity exploitation.

This link between culture of innovation and absorptive capacity can be justified in the following way. Stronger employee engagement in innovative behaviors, such as joint problem solving or open communication will engage employees in best practice and expertise sharing, thus this process can result in collectively identified alternative improvements to existing organizational processes that are no longer effective. Strong absorptive capacity, the ability to recognize the value of new information, can be subsequently used to critically evaluate such new alternatives and determine whether or not they should be exploited. They will be exploited, when absorptive capacity points out their economic potential. Consequently, the interactive effect of

culture of innovation and absorptive capacity should positively affect the likelihood of opportunity exploitation, resulting in superior performance.

In the context of healthcare, when emergency departments create a stronger culture of innovation, they induce stronger employee engagement in innovative behaviors. Stronger employee engagement in innovative behaviors will result in more collaborative efforts among medical staff of emergency departments, including expertise sharing, sharing of best practices, and disseminating of new knowledge relevant to various job functions. These employee behaviors will allow medical staff to collectively identify day to day practices that should be improved. When new improvement ideas are collectively identified and disseminated within a firm, greater absorptive capacity should allow emergency departments to select and implement only those improvements that will generate healthcare innovations. As a result, emergency departments should become better positioned to fully utilize their internal resources, and find the most effective methods of medical care delivery reflected in outcomes such as stronger customer focus, quicker recognition of changing customer preferences, better diagnosis of patient's medical needs, and more effective work arrangements. Such novel healthcare innovation will increase the effectiveness of internal operations of emergency departments, and thus will result in improved performance

The literature proposes a positive relationship between absorptive capacity and firm performance. It also identifies various cultural factors that may hinder the effectiveness of the process of knowledge creation and exploitation (e.g. Szulanski, 1996). Building on these assumptions, this dissertation suggests that stronger culture of innovation, by inducing more innovative employee behaviors, will enhance the effectiveness of absorptive capacity by allowing a firm to more effectively create new knowledge, disseminate it within a firm, and

thereby find best possible applications for such new knowledge. Given this proposition, stronger organizational culture of innovation should positively moderate the role of absorptive capacity resulting in a higher quality of medical care provided by emergency departments:

Hypothesis 5: There is a positive association between the interaction of culture of innovation and absorptive capacity and firm performance. Specifically, the interaction between culture of innovation and absorptive capacity is positively associated with a higher quality of medical care provided by emergency departments.

CHAPTER 7

DATA AND METHODOLOGY

The overarching objective of this study is to demonstrate organizational mechanisms that enable the process of opportunity exploitation. In particular, this research aims to investigate the organizational antecedents explaining variance in performance of healthcare organizations in the United States. Performance is measured by the quality of medical care provided by emergency departments. Both, primary and secondary sources of data were used to empirically test the proposed model.

The study examines the associations between organizational level phenomena including two latent constructs, organizational culture and absorptive capacity. These constructs reflect collective, employee perceptions of dominant cultural paradigms and organizational routines. Consequently, using surveys to measure such constructs is appropriate, because surveys permit the quantitative examination of the relationships among constructs which may be otherwise difficult to observe (Hatcher, 1994; Kraemer, 1991). The outcome variable in this study, performance of emergency departments is measured using the secondary data source. A correlational design was used to collect and analyze the survey data. The model proposes associations which were tested by using multivariate regressions with clustered robust standard errors.

Research setting and sample description

Because the study aims to investigate organizational sources of variance in the quality of medical care provided by U.S. healthcare organizations, emergency departments located in the United States should be viewed as an appropriate empirical context. One of the largest

Emergency and Hospital Medicine groups in the U.S. agreed to take part in this research. As a medical staff provider, the company has signed contracts according to which the firm provides medical staff, such as doctors, nurses, nurse practitioners, physician assistants to hospitals across the country. As of March 2012, the company had over 180 contracts for providing service to independently owned hospitals located in 20 states. These hospitals are located in geographically disperse areas including the South, Southwest, North, Northeast, Midwest and Northwest parts of the United States. Some of the hospitals participating in the study are located in big metropolitan areas, the others in smaller cities, college towns and rural areas. Because the participating emergency departments represent such a broad spectrum of socio-economic, cultural and geographical regions, I hoped, while designing the study, that these diverse characteristics will generate sufficient variation in the data used to test the proposed model.

Data collection process

All independent variables used in the model come from a primary data source—the survey administered to 1,820 employees of emergency departments at all hospitals participating in this study.

The following steps took place before the data collection. First, top management of the company received the information regarding the research subject and procedures, as well as potential risks and benefits associated with the participation in the study. Second, prior to the data collection, the study was submitted and approved by the Institutional Review Board (IRB) at the University of Illinois for review of the research on human subjects. Third, the pilot survey and a series of interviews with employees were administered at one of the participating hospitals in March 2012. Organizational research emphasizes the importance of pilot studies in the context

of generating reliable survey data (Groves, Fowler, Couper, Lepkowski, Singer & Tourangeau 2009). Pilot studies allowing to test the questionnaire's appropriateness and clarity for a given population and context. Thus, it can effectively help to eliminate or minimize undesirable error. No major changes to the language of the survey were made after obtaining and analyzing the results of the pilot study. The feedback received from the pilot indicated that the questionnaire and its items were clearly understood by the employees.

As a next step, all employees of the emergency departments at 182 participating hospitals received an email invitation to take part in the study. The invitation explained the overall objective of the study and included a link to the survey which was created and hosted at the Campus Information Technologies and Educational Services at the University of Illinois. Upon clicking on the link included in the invitation, the employees who decided to take part in the survey were redirected to the University of Illinois survey page. In accordance with recommendations of the IRB, the participants of the study were asked to read and sign a written consent, which explained the voluntary, anonymous and confidential character of this research. Thus, the participants were assured that individual responses would be kept confidential and that they were free not to participate in the study, or to terminate their participation at any given moment. In the last section of the survey, the participants were asked to include some demographic information, such as age, gender, education and job category. To ensure anonymity of responses, no other information that could compromise identity of the participants was collected.

The negative impact of common methods variance (CMV) on the study's results has been strongly established by research (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To minimize a potential likelihood of biased coefficients, each of the primary variables used in the model was

obtained from a different source. Consequently, there were two different versions of the questionnaire. The first version, the executive survey, included the measures of network diversity and absorptive capacity. The link to this survey was distributed to all directors of the emergency departments. The second version, the employee survey, included the measurements of organizational culture and absorptive capacity. The link to this version of the survey was emailed to all employees of emergency department excluding the directors.

The study aims to model the set of assumptions regarding the organizational level constructs. Each survey was however filled by individual employees. In order to measure the organizational level constructs based on individual perception, individual responses were aggregated to the group level. In such case, organizational level research recommends that at least two responses from employees of an organization should be received in order to aggregate individual responses to the group level. Consequently, hospitals were included in the sample only when at least two employee surveys (including the measures of organizational culture for innovation and absorptive capacity), and at least one executive survey (including the measures of network diversity and absorptive capacity) were received. The final sample in this study is composed of 376 individual responses from 71 emergency departments located in 14 different states across the United States. This produces the organizational level response rate of about 31%.

Measures

In their influential study, Kozlowski and Klein (2000) consider the issues associated with the level of analysis. The authors posit that unit-level constructs can either originate at the individual or the group level of analysis. In some cases, group-level constructs can be referred to

as “global”, which signifies that they originate at the group level and can be easily observable. Such “global” constructs include, for example, organizational size (number of employees), or an organizational structure (a configuration of departments and other organizational units). Kozlowski and Klein (2000) point out however that other organizational level constructs are not easily observable. The latent constructs originate at the individual level, and are operationalized as shared perceptions of individuals who are embedded in the same organizational context. Such constructs become “configural unit property,” and as such should be measured at the individual level (Kozlowski & Klein, 2000, p.217). The subsequent aggregation of the data collected at the individual level generates the measurement of the unit level construct—shared group constructs originating as the individual perception of the unit level phenomena.

According to the research recommendations articulated by Kozlowski and Klein (2000), absorptive capacity and organizational culture of innovation are viewed in this dissertation as “configural unit property”, or shared, organizational level constructs originating at the individual level of analysis. Consequently, absorptive capacity and culture of innovation were measured by using questionnaires administered to individual employees. Absorptive capacity and culture of innovation should be defined as latent constructs, variables which cannot be directly observed but should be inferred. Latent variables are viewed as “hypothetical,” non-observable, and described by perceptions, or imagination of individuals (Nunnally, 1978; Harman, 1960).

The measure of each of the latent constructs used in the dissertation was composed of multiple items. Each of the item had a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). The participants were asked to report the degree to which they agree with the statement associated with each individual item. The measure of network diversity was obtained from the directors of emergency departments. This measure provides the number (count) of the

department's business partnerships with external exchange partners representing four different geographical categories, each category represented 25% of the overall network diversity score. The outcome variable, performance of emergency departments, was assessed by two separate measures. First, the Clinical Outcome Index (COI) is a measure of organizational performance composed of items assessing clinical performance measurements of each emergency department. This clinical measure is widely used by research and reflects an average wait time for different forms of service provided to patients (Nelson, Mohr, Batalden & Plume, 1996).

Research recommends using robustness check in order to diagnose potential misspecifications of the regression analysis (White & Lu, 2010). The robustness check aims to demonstrate that the obtained coefficients are “robust”, meaning, they do not significantly change when the model is insignificantly modified. To assess the consistency and robustness of the obtained coefficients, an additional outcome variable capturing the quality of medical care—patient satisfaction—was included in the study. The measures of all primary variables used in the dissertation are provided in the appendix section.

Measure of performance: The quality of medical care

Performance of emergency rooms was the dependent variable used in the proposed model. Medical research shows that performance of healthcare organizations is measured in terms of the quality of medical care offered to customers, and aims to reflect the effectiveness of medical treatment provided to patients. Medical research uses both objective and subjective measurements of performance in the context of healthcare organizations. These measures include clinical outcomes of medical treatment, and patient satisfaction (Nelson, Mohr, Batalden & Plume, 1996).

Multiple outcomes of medical treatments are used in research on health care. They include such metrics as patient mortality index; complications index, patient safety index, core measures mean percent, 30-day risk-adjusted mortality rate for acute myocardial infarction (AMI), heart failure, and pneumonia; 30-day risk-adjusted readmission rate for AMI, heart failure, and pneumonia; severity-adjusted average length of stay; case mix- and wage-adjusted inpatient expense per discharge; HCAHPS score (patient rating of overall care). The mortality and complications measures are included in the index as they demonstrate how the hospital is performing on basic and essential care standards including survival and medical error rates while treating patients in the hospital. The inclusion of the extended outcomes measures (e.g. 30-day mortality, readmission rates, etc.) aims to evaluate the effectiveness of treatment over prolonged period time. Patient safety metrics aim to reflect both clinical quality and the effectiveness of medical care delivery during the stay of the hospital. This measure focuses on such aspects as surgical complications and other iatrogenic events, which are typical metrics assessing patient safety inside hospitals. Finally, the measure of patient perception of the quality of medical care is also included in the index. This measure represents the degree to which patients are satisfied with the quality of service during their stay in a hospital.

In this dissertation performance of emergency departments was measured by the Clinical Outcome Index (COI). The COI (mean= 103.7; s.d.=16.4) reflects the timeliness and effectiveness of service provided to patients at each emergency department during the calendar year of 2012. The overall COI index is composed of the following subscales: (1) average (median) time patients spent in the emergency department, before they were admitted to the hospital as an inpatient; (2) average (median) time patients spent in the emergency department, after the doctor decided to admit them as an inpatient before leaving the emergency department

for their inpatient room; (3) average (median) time patients spent in the emergency department before being sent home; (4) average time (median) patients spent in the emergency department before they were seen by a healthcare professional; (5) percentage of patients who left the emergency department before being seen by a doctor. Each of the five subcategories represented 20% of the overall index. Because the COI captures patients' waiting time for necessary services at each emergency department, the higher value of the COI index signifies a longer waiting time. Consequently, the higher value indicates a lower quality of medical care.

The second measure of performance was used to test robustness of the model. The measure was the Patient Satisfaction Index (PSI) (mean=68.4; s.d.=7.1). This index measures patient satisfaction with the quality of service received at each emergency department, and is based on the data reported by patients during the calendar year of 2012. The overall PSI for each emergency department was calculated based on the patient evaluation that: nurses communicated effectively; doctors communicated effectively; patients received help in a timely manner; their pain was well controlled; staff provided sufficient information about medicines before giving it to patients. In a case of the PSI, a higher number of index indicates higher patient satisfaction, therefore, it signifies higher quality of medical care.

Measure of network diversity

The measure of network diversity was adapted from the previous literature (Goerzen & Beamish, 2005; Goerzen, 2001; Powell, Koput & Smith-Doerr, 1996). This measurement reflects the heterogeneity of external ties that each emergency department possesses. This scale was included in the executive survey. All directors of the emergency departments were asked to identify their departments' business contacts in four geographically disperse categories (ranging

from local to national contacts). The items include: “*please list all professional contacts between your department and other businesses (including hospitals, firms in the medical field, and firms in other industries) in your city*” (Appendix 2). The number of contacts identified in each of four categories represented 25% of the overall index. The sum obtained from all four categories produced the overall Network Diversity Index for each emergency department (mean=5.2, s.d.=2.4).

Measure of absorptive capacity

The measure of absorptive capacity was adapted from Jansen, Van Den Bosch & Volberda (2005). According to research, absorptive capacity encompasses organizational routines and processes enabling knowledge acquisition, transformation and exploitation. All employees participating in this research were asked to provide their perception of this organizational level construct. Absorptive capacity, as conceptualized by Jansen, Van Den Bosch & Volberda (2005) includes items, such as: “*my emergency department has frequent interactions with administration of the hospital to acquire new knowledge*”; “*new opportunities to serve our patients are quickly understood*”; “*we record and store newly acquired knowledge for future reference*”; “*it is clearly known how activities within our department should be performed*” (all items are listed in the appendix section).

This measurement of absorptive capacity has been used and found reliable in previous empirical studies (Jansen, Van Den Bosch & Volberda, 2005). The following steps were taken to ensure the reliability of the instrument. First, the Cronbach’s alpha level of internal reliability was calculated. For this scale, $\alpha = 0.86$ (mean=2.98, s.d.=.29). Results therefore support internal consistency of the overall construct. Second, because in this dissertation, individual responses

were aggregated to the organizational level, the inter-class correlation (ICC) statistic to determine the reliability of the survey measures was also necessary (Bliese, 2000; 1998). According to Bliese, ICC (1) indicates the reliability of an individual respondent within a unit, while ICC (2) is a measure of the reliability of the unit-level based on its mean. In case of absorptive capacity, ICC (1) was 0.29, while the ICC (2) statistics was .81 indicating acceptable level of within a unit variability (Bliese, 2000). Third, in the proposed model, the construct of absorptive capacity is conceptualized as composed of four dimensions (Jansen, Van Den Bosch & Volberda, 2005). After conducting the factor analysis, the KMO and Bartlett's tests demonstrated that the items loadings were significant and that the items represent a latent construct. The communalities analysis showed an accepted level of loading for each individual item (after the item "absorptive capacity 8" was removed from the model). The eigenvalues for the extracted factor was high and cumulatively explained over 50 % of the variance. Subsequently, the confirmatory factor analysis using SPSS AMOS 20 was conducted. Various tests, such as chi-square, RMSEA (Root Mean Square Error of Approximation); NFI (Normed Fit Index); CFI (Comparative Fit Index); GFI (goodness of fit) are recommended to confirm good fit between model and data (Kenny, Kaniskan & McCoach, 2011; Joreskog & Sorbom, 1993). The confirmatory factor analysis demonstrated an acceptable fit for absorptive capacity. Chi-square: 395.3 (d.f. 178); CMIN=3.920; $p < .01$; RMSEA=.059; CFI=.878; NFI=.91; GFI=.891

Measure of culture of innovation

The measure of organizational culture aims to capture collective perception of employees that innovation is as a dominant cultural paradigm. This scale was extensively validated by

previous studies (Anderson & West, 1998; Scott & Bruce, 1994). This survey instrument is composed of 15 questions. The items are conceptualized as a latent construct representing the organizational level phenomenon (Appendix 1). Sample items include “*the department is open and responsive to change*”; “*assistance in developing new ideas is readily available*” “*our department is always moving forward the development of new answers*”. The alpha level of internal reliability for this scale was above $\alpha = 0.8$ (mean=2.92, s.d. =.27). Similarly to the construct of absorptive capacity, a collective perception of organizational culture is also represented by individual responses aggregated as the hospital level variable. Consequently, the analysis of inter-class correlation (ICC) statistic which determines the reliability of the measure was recommended (Bliese, 2000). In case of organizational culture, ICC (1) .36, while the ICC (2) statistic was .86 indicating sufficient within-unit consistency.

This construct was conceptualized as one factor, the factor loading revealed the one-factor model as significant. The KMO and Bartlett’s test confirmed that the items loading were significant and that the items represent a latent construct. The communalities analysis shows an accepted level of loading for each individual item. The eigenvalue for the extracted factor was above 1, and explains over 50 % of variance. The confirmatory factor analysis using SPSS AMOS 20 was conducted. It confirmed an acceptable fit between data and model for organizational culture with chi-square: 189.3 (d.f. 98); CMIN=3.120; $p < .01$; RMSEA=.053; CFI=.93; NFI=.92; GFI=.90.

Control variables

Research recommends that control variables should be included in the proposed model to statistically control for possible alternate explanations to the findings (Draper, Smith & Pownell,

1966). Control variables should be included in the regression model when previous studies suggest that such variables can account for additional variance in the level of dependent variables. Thus, the inclusion of control variables should increase the variance explained by the model. Furthermore, it should allow the generation of regression coefficients that will reflect the association between independent and dependent variables while controlling the impact on other relevant factors, which may impact the strength of the hypothesized relationships.

Based on research recommendations, several organizational and regional characteristics were included in the model. These include hospital's age and size. The literature extensively investigates the role of a firm's age in the context of firm performance. This variable aims to reflect a stage of organizational development. According to research, older firm experience increasing inertia, which may lead to deteriorating performance and eventual demise (Hannan & Freeman, 1984). The literature in strategy links firm's size to its performance. The association could be viewed as important because a firm's size could be linked to its ability to share resources among units, better utilize economy of scale and economy of scope (Ullmann, 1985). A firm's size was controlled by using the number of hospital employees. Furthermore, because research has long identified risk as a critical factor affecting the process of innovation (Knight, 1921), business risk propensity was also included as a control variable. It was measured by 5 item questionnaire, which was answered by the directors of emergency departments.

Consistent with research recommendations, other control variables used in this study include demographic characteristics of the area in which each emergency department is located, such as median income in a county, rural or urban character of location (rural coded 0 and urban coded 1); and the existence of competition measured by the number of other hospitals operating in geographical proximity. Hospital's ownership reflecting a form of organizational governance

was coded as 0 (for profit) and 1 (not for profit). The model also included non-teaching (coded 0) or teaching (coded 1) research or academic affiliations (Eldenbug, Hermalin, Weisbach & Wosinska, 2004; Becker & Sloan, 1985).

In addition, this dissertation theorizes the moderating effect of organizational culture on the relationship between entrepreneurial capacity and firm performance. Consequently, the variable of culture of innovation was included as a baseline control variable in the models measuring the main effect of network diversity and absorptive capacity, as well as the interactive effect of the two concepts on firm performance.

Sample size and power

Research clearly recognizes the benefits associated with larger samples, thus it recommends that larger samples should be used to empirically test theoretical models. Osborne and Costello (2004), for example, explain that larger samples may increase accuracy of estimations, and generalizability of findings. The authors warn that a small sample size can result in the over-fitting of the estimates, thus it will produce inflated error.

There are some important guidelines pertaining to sample size when multivariate regression analyses are used. Research distinguishes two distinct approaches to determine minimum sample size. One of the approaches suggests that it should be determined by an absolute number of all subjects. The second approach suggests that a ratio between a total number of subjects and a total number of independent variables should determine whether or not a given sample is acceptable. When the absolute number of subjects is used, research recommends a minimum sample size of $N=50$ (Comfrey & Lee, 1992; Barrett & Kline, 1981).

There is a lack of agreement about what ratio between number of subjects and number of independent variables constitutes sufficient sample size. Hatcher (1994) suggest that the ratio should not be lower than 5:1 (a total number of subjects to a total number of independent variables). The author recognizes however that higher ratios are recommended because they will increase the accuracy of estimates. As a rule of thumb, Nunnally (1978) recommends that sample size should be set at about 10:1. Others scholars view smaller ratios as also acceptable, emphasizing that due to methodological diversity there should not be one universal rule regulating what sample size should be viewed as appropriate (MacCallum, Widaman, Preacher, & Hong, 2001).

In this dissertation, the firm is used as the level of analysis. Therefore, there are 71 emergency rooms used to empirically test the model. The sample of 71 ($N=71$) meets general guidelines when absolute number of observations ($N=50$) is used as a main criterion (Comfrey & Lee, 1992; Barrett & Kline, 1981). When the ratio approach is considered (all subjects to variables used in the model) the study also meets requirements, however the ratio varies depending on a tested hypothesis. The ratio ranges therefore from 8:1, when the main effect hypotheses are tested, to below 6: 1 when the full model is tested. Consequently, in accordance with current research guidelines, sample size used in this dissertation ($N=71$) meets general recommendations and should be viewed as acceptable.

Related to sample size, power of the statistical test estimates the likelihood that the null hypothesis will be rejected when the null hypothesis is false. In order to increase power of the test, research recommends that sample size should be sufficiently large. It is recommended that power of the test ($1-\beta$) remains higher than the level of 80% (Cohen, 1988). Such 80% power indicates that there is 80% likelihood that the study will produce coefficients with a p-value of

less than the alpha level. The post hoc test revealed that power of the test was at the level higher than 80%.

T-test for equal means of two samples

Emergency departments are the unit of analysis. The surveys were distributed among employees working at over 180 hospitals and were received from 119 hospitals. Only the data from 71 hospitals were however used to statistically test the hypotheses. This took place because the model assumed that multiple responses from each unit should be used to assess group-level variables (2 responses from employees and 1 response from a director). As a result, responses from 48 hospitals were not included in the study.

T-tests for the equal means of the samples were therefore conducted to determine whether or not the data received from the emergency departments used in the sample (N=71) differ systematically from the larger population (N=119). To determine the extent to which the restricted sample was representative of a larger population of hospitals, firm performance outcome and firm size (number of employees) were compared between the restricted sample and the sample of hospitals that were not used in the study.

The tests comparing the means of two samples can determine whether or not some systemic bias is present, thus, whether or not the sample used for statistical tests can be viewed as representative of some larger population (Armstrong & Overton, 1977).

TABLE 1

Organizational performance: The two sample t-test for equal means

	N	Mean	Std. Error difference	t	P> (t)
Emergency Departments used in the study	71	103	.176	1.4	.152
Emergency Departments not used in the study	48	111			

TABLE 2

Firm size: The two sample t-test for equal means

	N	Mean	St. Error difference	t	P> (t)
Emergency Departments used in the study	71	430	.121	1.45	.165
Emergency Departments not used in the study	48	418			

The null hypothesis in the two sample t- test assumes no significant differences between the means of both samples. The test result presented in Table 1 and Table 2 show that the null hypothesis cannot be rejected, implying that there are no statistically significant differences between the means of the compared samples. Therefore, it can be concluded that the final sample used to conduct empirical testing in the dissertation was representative of a larger population of emergency departments.

Data analysis process

As described in the previous section, the data received from the emergency departments participating in the study were examined in order to diagnose potential problems of normality, linearity, and homoscedasticity of variance. Research shows that performing exploratory

analyses is critical, as it determines whether or not results of statistical testing will produce biased coefficients (Tabachnick & Fidell, 2007; Hays, 1973).

Stepwise multivariate regression analyses was used to test the main effect of network diversity on the quality of medical care provided by emergency departments (Hypotheses 1), as well as the main effect of absorptive capacity on the quality of care (Hypothesis 2). Furthermore, multivariate regression analyses were also performed to test the moderating effects of culture of innovation, and the three way interaction effect proposed by the final model of the dissertation. The multivariate regression analysis permits to simultaneously evaluate the strength and direction of each relationship between the independent and dependent variables (Hays, 1973). The statistical technique allows therefore to analyze the relationship between a single dependent variable and several independent variables whose values are used as predictors of the level of dependent variable. The contribution of each single independent variable is weighted by the regression analysis to ensure its optimal prediction.

The model proposed in the dissertation includes two main effect hypotheses theorizing associations between network diversity and absorptive capacity in the context of the dependent variable. In a case of these two main effect hypotheses, separate regression models were run for each independent variable, thus each main effect model excluded the other main effect independent variable.

In the regression analysis, coefficients are estimated to minimize the total sum of squared residuals. The signs of coefficients are very relevant as they determine positive or negative characters of associations between independent and dependent variables. In this dissertation, the significance of coefficients was considered at the alpha level of less than or equal to 0.05. This alpha level determines the probability of getting significant regression coefficients although the

null hypothesis was true (should not be rejected), or in other words, it determines the probability of getting results of regression by chance (Hays, 1973).

To calculate results of the regression analysis, STATA 12 was used. During the first step, only control variables, identified by previous research as relevant in the context of the performance of emergency departments were included in the model. Second, to test Hypothesis 1, network diversity was added to the model that already included control variables. Third, absorptive capacity was added to the model including the control variables after the measure of network diversity was removed from the model (Hypothesis 2). Subsequent hypotheses proposed in the model test the moderating effect of absorptive capacity and organizational culture of innovation. Consequently, the interaction between network diversity and absorptive capacity (Network* ACAP), culture of innovation and network diversity (Network*Innovation), culture of innovation and absorptive capacity (Network*ACAP) were added to test corresponding associations (Hypotheses 3-5).

To assess moderating effects of interactions between variables in the context of the dependent variable, mean-centered independent variables were used. According to research, the variables used to assess moderating effects should be mean centered in order to reduce the potential bias associated with their multicollinearity (West & Aiken, 1991).

Clustered robust standard errors

According to research correlated data can be widely present while examining common phenomena in social science (Kreft & de Leeuw, 1998). For example, a manager's evaluation of an employee performance should be correlated with an employee self- assessment of his or her own performance. In a case of employees working together in the same work setting, researchers

should expect a higher similarity of responses as compared to the situation when employees work in different, unrelated work contexts.

When multiple subjects evaluate the same construct, data correlations may produce biased coefficients misrepresenting the character of hypothesized relationships. In order to reduce this problem, research suggest that clustered robust standard errors should be used when proposed associations are statistically tested at a group-level. In such a case, research suggests that the data should be clustered at the highest possible level of correlations among responses (Zeger & Liang, 1986). Thus, robust standard error clustering responses at a level representing the highest possible grouping, has been recommended to reduce potential bias in regression coefficients (Acemoglu & Pischke, 2003). Based on research recommendations, in this dissertation, multivariate regression analyses were performed using clustered robust standard errors grouped at the level of emergency departments.

Furthermore, multivariate regression analyses producing standardized coefficients were also performed in order to reveal and compare the magnitude of the associations between each independent variable, the interactive terms, and the dependent variable.

CHAPTER 8

RESEARCH RESULTS

This chapter presents results of the empirical analyses conducted on the data collected at 71 emergency departments participating in this study. The chapter presents descriptive statistics and results of the multivariate regression analyses conducted to test the two main effect hypotheses (network diversity-performance, absorptive capacity-performance); the moderating effects hypotheses that include: absorptive capacity on the relationship between network diversity and performance; culture of innovation on the relationship between network diversity and performance; culture of innovation on the relationship between absorptive capacity and performance. Additional statistical tests, results of exploratory data analyses are included in Appendix 1.

Descriptive statistics and correlations

Tables 3 and 4 provide the summary of descriptive statistics and the correlation matrix of all variables used in the study. Several interesting observations can be made. The observed range of hospital's age, size (number of employees) and income (median family income in the areas in which hospitals are located) is very substantial. The eldest hospital included in the sample is over 100 years old, the newest one is only 8 years old. The largest hospitals included in the sample employs over 2,000 employees, while the smallest hospital employs less than 100 employees. The median family income in the most affluent areas included in the sample is over three times higher than the median family income in the least affluent areas included in the sample.

Correlation coefficients allow to measure the size and direction of the relationship between the variables when the effect of other variables is excluded (Tabachnick & Fidell,

2001). Correlation coefficients are obtained to determine associations among all independent variables, control variables and the dependent variable. The analysis of the correlation matrix can reveal the problem of multicollinearity, when the level of correlations among variables is too high. This could make impossible to separate individual effects of the highly correlated variables (Montgomery, 2001). Consequently, multicollinearity results in biased coefficients. Cohen (1988) provides some useful guidelines referring to the multicollinearity problem. The author explains that correlations falling in a range between 0.1-0.3 should be considered as low, correlations in a range between 0.3 and 0.5 are moderate, correlations higher than 0.5 should be viewed as large, while the variables correlating at the level above 0.8 should be viewed as very strong, and eliminated from the model due to multicollinearity. According to the obtained correlation matrix, all correlation coefficients fall within the range between small to moderate correlations. Thus, no variables should be removed from the model due to the problem of multicollinearity.

First, it should be noted that, in this study, a higher number of the performance variable indicates a lower quality of medical care, while a lower performance index indicates a higher quality of medical care (a shorter wait time for various medical services at emergency departments). The correlation matrix (Table 4) reveals some interesting results. The performance outcome reflecting patient's wait time for necessary medical services shows moderate to strong correlations with other variables. This is not, however, surprising because all variables included are identified by previous research as relevant in the context of firm performance in health care; moderate to strong positive correlations between performance and independent variables were expected. The correlation matrix confirms this expectation, as ten out of eleven independent variables included in the model are positively correlated with performance. The only notable

exception is the variable coded as “for profit” equals 0, and “not for profit” equals 1. The obtained coefficient (-.21, $p < 0.05$) reveals a negative association between performance and status. Due to the coding process, this coefficient shows a decrease in performance from group coded as 0 (not for profit) to group coded as 1 (for profit). In a case of emergency departments included in the sample, it indicates that emergency departments operating in for profit hospitals perform better than emergency departments located in not for profit hospitals.

The correlation matrix reveals several moderately high correlations, such as the correlations between performance and income (-.49); performance and competition (-.47); and competition and income (-.42). The lowest reported correlation coefficients are between income (median family income in a county where a hospital is located) and business risk propensity (0.006), and between firm age and teaching status (coded as “not teaching”=0 and “teaching” coded as 1) at 0.01.

The status variable (for profit/not for profit) reflects whether or not an emergency department operates in for profit (coded 0), or not for profit hospital (coded as 1). This variable shows negative linear associations with almost all other variables, implying a negative change between the “for profit” group and the “not for profit” group in relation to such variables as network diversity (-0.13), absorptive capacity (-0.17), and culture of innovation (-0.19).

The correlation coefficients of the three main independent variables used in the study (network diversity, absorptive capacity and culture of innovation) fall within the range from low to moderate: network diversity-absorptive capacity (0.28, $p < 0.05$); network diversity-culture of innovation (0.20, $p < 0.05$), and absorptive capacity-culture of innovation (0.28, $p < 0.05$).

The correlation coefficients of performance in relation to the three main variables reveal moderately high, positive, statistically significant relationships: performance-network diversity

(-0.41, $p < 0.05$); performance-absorptive capacity (-0.40, $p < 0.05$); performance-culture of innovation (-0.36, $p < 0.05$).

TABLE 3

Descriptive statistics

	Variable	Abs	Mean	Standards Deviation	Min	Max
1	Age	71	67	27	8	119
2	Rural Urban	71	.52	.5	0	1
3	Income	71	42,398	14,372	26,450	91,366
4	Competition	71	.83	.84	0	3
5	Number of Employees	71	430	380	97	2,100
6	Teaching/Non- Teaching	71	.45	.46	0	1
7	Status	71	.39	.49	0	1
8	Risk Propensity	71	3.01	.76	1.4	4.6
9	Network Diversity	71	5.21	2.3	2.2	10.5
10	ACAP	71	2.97	.31	2.4	3.52
11	Culture of Innovation	71	2.92	.28	2.38	3.48
12	Performance	71	103	16.4	77	135

TABLE 4

Correlations

	Variable	1	2	3	4	5	6	7	8	9	10	11
1	Performance	1.0										
2	Network	.41	1.0									
3	Absorptive Capacity	.40	.29	1.0								
4	Culture of Innovation	.36	.20	.28	1.0							
5	Age	.11	.04	.03	-.10	1.0						
6	Rural/Urban	.32	.19	.21	.27	-.02	1.0					
7	Income	.49	.23	.30	.36	-.02	.37	1.0				
8	Competition	.47	.25	.31	.34	.08	.42	.48	1.0			
9	No. of Employees	.15	.12	.04	.17	-.07	.28	.07	.32	1.0		
10	Teaching	.31	.21	.25	.18	.01	.20	.26	.30	.28	1.0	
11	Profit-Non profit	-.21	-.13	-.17	-.19	-.20	.18	-.17	-.13	-.26	-.18	1.0
12	Risk	.18	.24	.29	.12	.23	-.04	.00	.20	.05	.15	.08

Signs of coefficients were changed: positive coefficients represent positive association with performance

Correlations at the level of .16 and above are significant ($p < .05$)

Results of regression analyses

Table 16 presents results of the OLS regression analyses for the main effects of network diversity and absorptive capacity (Hypothesis 1 and Hypothesis 2), as well as results of the regression analyses for the moderating effects, and the hypothesized three-way interaction effect of network diversity, absorptive capacity and culture of innovation on quality of medical care (Hypothesis 3-Hypothesis 6). Robust standard errors were clustered at the level of emergency departments.

Model 2: Main effect of network diversity

Hypothesis 1 proposes the positive association between network diversity and quality of medical care provided by emergency departments. Results of this statistical test are revealed by Model 2. Results show that a higher level of network diversity is positively associated with better quality of medical care, and it is statistically significant (unstandardized $b=1.6$, $S.E.=7.2$, $p<.05$; standardized $b=.23$, $p<.05$). In this model, network diversity was added to the baseline regression model. It turns out that Model 2 explains 37% of variance in the performance outcome (adj. $R-sq.=0.37$). Therefore, results show the increase in variance explained when compared to variance explained by Model 1 ($\Delta=0.06$). This increase in variance explained can be attributed to the addition of network diversity.

An interesting characteristic of Model 2 are strong regression coefficients signifying relationships between performance and competition, and performance and research affiliation (hospitals coded as either “no teaching affiliation” =0, “teaching affiliation”=1). These coefficients indicate that emergency departments operating in more competitive markets perform better than emergency departments operating in less competitive markets. Furthermore, the

emergency departments located in hospitals with teaching affiliations also perform better than emergency departments from hospitals without teaching affiliations.

Based on the results presented in Model 3, the hypothesized positive association between network diversity and quality of medical care provided by emergency departments is supported by the data used to empirically test the model (Hypothesis 2 supported).

Model 3: Main effect of absorptive capacity

Hypothesis 2 proposes the positive association between absorptive capacity and quality of medical care provided by emergency departments. Results of this test are presented in Model 3. In Model 3, absorptive capacity was added to the baseline regression Model 1 including control variables. To measure the main effect of absorptive capacity, network diversity was removed from this model.

The results of the test reveal that Model 3 explains 36% of variance in quality of medical care (adj. R-sq. =0.36). As compared to the baseline Model 1, Model 3 indicates an increase in variance explained by 0.05 ($\Delta=0.05$). This increase in variance explained in the performance outcome can be attributed to the inclusion of absorptive capacity.

Results show that a higher level of absorptive capacity is positively associated with better quality of medical care, this relationship is however not statistically significant ($b=15.62$, S.E. =7.22; standardized $b=.22$). Consequently, this coefficient does not support the association proposed in Hypothesis 2. It should be recognized, that the effect of absorptive capacity on quality of medical care becomes statistically significant when culture of innovation (a control variable) is removed from the model. This effect of culture of innovation on the main effect of

absorptive capacity in the context of firm performance could signal some degree of interdependence between those two variables.

Based on the results presented in Model 3, the hypothesized positive association between absorptive capacity and quality of medical care provided by emergency departments is not supported by the data, and thus hypothesis 2 is not supported.

Model 5: Effect of entrepreneurial capacity (interactive effect of network diversity and absorptive capacity)

Hypothesis 3 proposes the positive effect of entrepreneurial capacity on firm performance. In other words, this hypothesis theorizes the main relationship proposed in this dissertation: a positive interactive effect of absorptive capacity and network diversity on quality of medical care provided by emergency departments. Besides control variables, absorptive capacity, network diversity and the interactive term representing an interaction between absorptive capacity and network diversity (Network* ACAP) were also added to this model.

Results of this test indicate that variables included in this model explain 42% of variance in quality of medical care provided by emergency departments (adj. R-sq. = 0.42). As compared to the baseline model, Model 5 indicates an increase in variance explained by 0.11 ($\Delta=0.11$). This increase in variance explained in the quality of medical care can be attributed to network diversity, absorptive capacity and the interactive term between those two variables (Network*ACAP). When compared to Model 2 including control variables and network diversity, variance explained by Model 5 increases by 0.05 ($\Delta=0.05$). This increase in variance explained can be therefore attributed to absorptive capacity and the interactive term of network diversity and absorptive capacity (Network*ACAP). When variance explained by Model 5 is

compared to variance explained by Model 3, which included control variables and absorptive capacity, adj. R-sq. increases by 0.06 ($\Delta=0.06$). This increase in variance explained captures the impact of network diversity and the interaction of network diversity and absorptive capacity (Network*ACAP). Finally, when variance explained by Model 5 is compared to variance explained by Model 4, which includes all control variables, plus network diversity and absorptive capacity, adj. R-sq. increases by 0.04 ($\Delta=0.04$). This increase in variance explained captures the sole impact of the interaction between network diversity and absorptive capacity (Network*ACAP).

Model 5 reveals that the association between the interaction term (Network*ACAP) and performance is statistically significant ($b= 7.38$, S.E. =3.53, $p<0.05$; standardized $b=.23$, $p<.05$). Results show therefore the positive effect of entrepreneurial capacity on firm performance. When emergency departments develop a higher level of absorptive capacity, the positive association between network diversity and performance will increase. Based on this outcome, the data used to empirically test Hypothesis 3 support the proposed role of entrepreneurial capacity.

Although, the values of the regression coefficients of network diversity and absorptive capacity are high and positively associated with performance (respectively $b=1.29$, S.E. =7.1 for network diversity; $b=13.2$, S.E. =7.4 for absorptive capacity), they are however not statistically significant when an interactive term (Network*ACAP) is included in the model.

Based on the empirical testing of Hypothesis 3, the postulated, positive association between entrepreneurial capacity and quality of medical care provided by emergency departments participating in the study is supported (Hypothesis 3 supported).

Model 6: Interactive effect of culture of innovation and network diversity

Hypothesis 4 proposes the positive moderating effect of culture of innovation on the association between network diversity and quality of medical care provided by emergency departments. Consequently, the interactive term between network diversity and culture of innovation (Network* Culture) was added to this model.

Results show that this model explains 41% of variance in quality of medical care provided by emergency departments (adj. R-sq. = 0.41). As compared to the baseline model with control variables, variance explained by Model 6 increases by 0.10 ($\Delta=0.10$). This increase in variance explained can be attributed to network diversity, absorptive capacity and the interactive term (Network*Culture). When compared to Model 2 including control variables and network diversity, variance explained by Model 6 increases by 0.04 ($\Delta=0.04$). This increase in variance explained can be credited to the inclusion of absorptive capacity and the interactive term (Network*Culture) in the model. Finally, when variance explained by Model 6 is compared to variance explained by Model 4, which includes all control variables, plus network diversity and absorptive capacity, adj. R-sq. increases by 0.03 ($\Delta=0.03$). This increase in variance explained captures the sole impact of the interaction between network diversity and culture of innovation (Network*ACAP).

The values of the regression coefficients of network diversity, absorptive capacity, and culture of innovation are positively associated with firm performance (respectively $b=1.18$, S.E. =7.4 for network diversity; $b=14.7$, S.E. =7.9 for absorptive capacity, and $b=5.9$, S.E. =7.7 for culture of innovation), they are however not statistically significant when an interactive term (Network*Culture) is present in the model.

Model 6 shows that the hypothesized moderating effect of culture of innovation on the relationship between network diversity and performance is not significant ($b=3.9$, $S.E. =3.01$; standardized $b=.17$). Results show therefore that the data used in the study do not support hypothesis 4, and thus hypothesis 4 is rejected.

Model 7: Interactive effect of culture of innovation and network diversity

Model 7 tests the positive moderating effect of culture of innovation on the association between absorptive capacity and firm performance. Consequently, the interactive term (ACAP*Culture) was added to this model.

Results show that this model explains 45% of variance in quality of medical care provided by emergency departments (adj. R-sq. = 0.45). Consequently, it shown an increase in adj. R-sq. by 0.14 ($\Delta=0.14$) when compared to Model 1, the baseline model comprising of control variables. The increase in adj. R-sq. can be attributed to absorptive capacity, culture of innovation and the interactive term (ACAP*Culture). When compared to Model 3 that assesses the main effect of absorptive capacity, variance explained by Model 7 increases by 0.09 ($\Delta=0.09$). This increase in variance explained can be attributed to the inclusion of network diversity the interactive term (ACAP*Culture). When variance explained by Model 7 is compared to variance explained by Model 4, which includes all control variables, plus network diversity and absorptive capacity, adj. R-sq. increases by 0.07 ($\Delta=0.07$). This increase in variance explained captures the sole impact of the interaction between absorptive capacity and culture of innovation (Network*ACAP).

Model 7 reveals that the coefficient representing the hypothesized interactive effect of culture of innovation and absorptive capacity (ACAP*Culture) is statistically significant ($b=23.9$,

S.E. =9.7, $p < 0.05$; standardized $b = .28$, $p < .01$). Results suggest therefore that when emergency departments develop a higher level of culture of innovation, an interaction between absorptive capacity and culture of innovation will be positively associated with quality of medical care provided by emergency departments.

The regression coefficients of network diversity, absorptive capacity, and culture of innovation are positively associated with firm performance (respectively $b = 1.9$, S.E. =.63 for network diversity; $b = 5.08$, S.E. =8.0 for absorptive capacity, and $b = 8.1$, S.E. =5.3 for culture of innovation). Furthermore, the coefficient representing the impact of network diversity ($b = 1.9$, S.E. =.63; $p < .005$) is statistically significant. Based on the presented results, hypothesis 5 is supported.

TABLE 5

Regression results (unstandardized with clustered robust standard errors)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	.01861 (.0566)	.0119 (.0517)	.0165 (.0503)	.0228 (.0531)	.0396 (.0538)	.01862 (.05323)	.04763 (.0540)
Rural-Urban	3.108 (3.615)	2.527 (3.351)	2.374 (3.431)	1.812 (3.329)	2.646 (3.342)	2.692 (3.323)	.7687 (3.017)
Income	.0003 (.0001)	.0002 (.0001)	.0002 (.0001)	.0002 (.0001)	.0003 * (.0001)	.0002 (.0001)	.0002 (.0001)
Competition	2.9778 (2.738)	2.755 (2.679)	2.165 (2.703)	2.169 (2.629)	1.0967 (2.089)	2.569 (2.651)	2.252 (2.704)
Number of Employees	-.0013 (.0027)	-.0010 (.0027)	-.0121 (.0138)	-.00073 (.0012)	-.0007 (.0029)	.00150 (.0028)	.00119 (.0029)
Teaching/ Nonteaching	3.9034 (3.337)	3.422 (3.234)	2.999 (3.287)	2.542 (3.004)	3.376 (3.171)	3.944 (3.225)	2.867 (3.194)
Status (profit/nonprofit)	-3.9052 (3.311)	-3.1518 (3.370)	-2.397 (3.266)	-2.426 (3.3469)	-2.618 (3.026)	-3.573 (3.351)	-4.536 (3.537)
Risk Propensity	1.584 (1.846)	.8210 (2.025)	.9455 (1.927)	.44370 (1.985)	.2176 (2.105)	.0648 (1.926)	1.199 (2.095)
Culture of Innovation	9.838 (6.172)	9.041 (6.274)	7.813 (6.202)	7.5559 (6.257)	1.2982 (.7178)	1.189 (.747)	1.9014* (.6354)
Network Diversity		1.603 * (.726)		1.3512 (.7251)	13.255 (7.463)	14.701 (7.979)	5.080 (8.013)
Absorptive Capacity			15.625 (8.220)	14.674 (7.4637)	9.604 (6.338)	5.960 (7.715)	8.103 (5.319)
Net*ACAP					7.382 * (3.535)		
Net*Culture						3.901 (3.017)	
ACAP*Culture							23.947* (9.7023)
R-Squared	0.40	0.45	0.45	0.48	0.52	0.51	0.54
Change in R-Sq.		+0.05	+0.05	+0.08	+0.12	+0.11	+0.14

Signs of coefficients were changed: positive coefficients represent positive association with performance

* $p < 0.05$ ** $p < 0.00$

TABLE 6

Regression results (standardized coefficients)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	.03	.04	.05	.05	.07	.04	.05
Rural-Urban	.11	.08	.09	.07	.08	.07	.02
Income	.26*	.25*	.23	.23	.27*	.23	.22
Competition	.17	.15	.12	.12	.07	.11	.13
Number of Employees	.04	.04	.01	.02	.04	.02	.02
Teaching/ Nonteaching	.11	.10	.09	.07	.09	.10	.08
Status (profit/nonprofit)	-.12	-.10	-.09	-.09	-.06	-.09	-.07
Risk Propensity	.07	.03	.02	.01	.01	.00	.00
Culture of Innovation	.18	.16	.15	.14	.16	.08	.14
Network Diversity		.23*		.21*	.18	.17	.27*
Absorptive Capacity			.22	.18	.17	.21	.10
Net*ACAP					.23*		
Net*Culture						.17	
ACAP*Culture							.28**
Adj. R-Squared	0.31	0.37	0.36	0.38	0.42	0.41	0.45
Change in Adj. R-Sq.		+0.06*	+0.05*	+0.07*	+0.11*	+0.10*	+0.14**

Signs of coefficients were changed: positive coefficients represent positive association with performance

* $p < 0.05$ ** $p < 0.001$

Interactive effects: Plot analysis

Research suggests that significant interactive effects between two or more independent variables should be confirmed by creating graphical plots representing such relationships (West & Aiken, 1991). Consequently, the significant interactive effects of the independent variables in the context of the performance of emergency departments are graphically depicted.

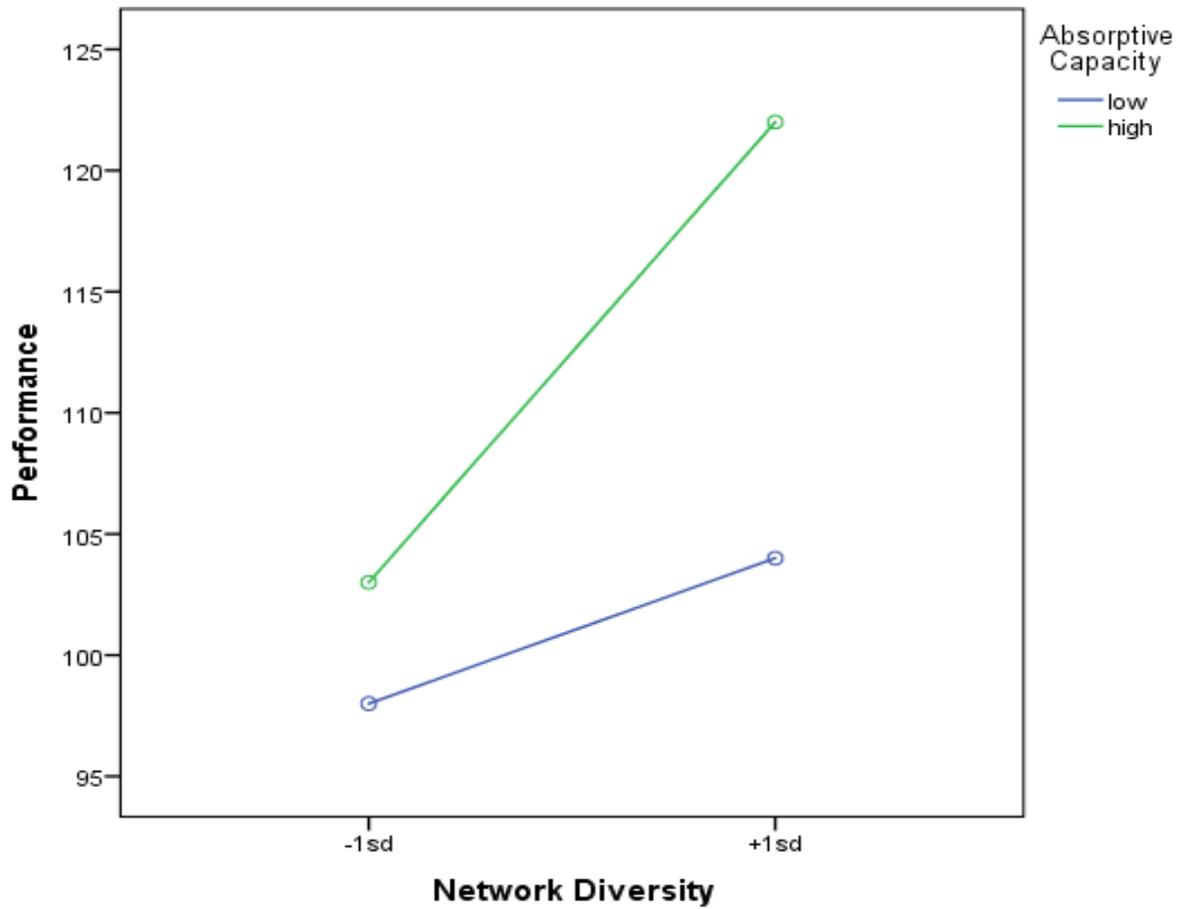
Interactive effect of network diversity and absorptive capacity

The plot presenting an interactive effect between network diversity and absorptive capacity (Model 5) reveals the following characteristics. Figure 3 shows the main effect of network diversity on performance, as the higher level of network diversity (1 standard deviation above the mean) results in better performance than a lower level of network diversity (1 standard deviation below the mean). The plot also reveals the main effect of absorptive capacity: there is an increase in firm performance from weaker absorptive capacity (1 standard deviation below the mean) to stronger absorptive capacity (1 standard deviation above the mean).

The plot also reveals the interactive effect between network diversity and absorptive capacity. The line representing weaker absorptive capacity (1 standard deviation below the mean) indicates some improvement in performance, when network diversity increases. The line representing stronger absorptive capacity (1 standard deviation above the mean) shows however stronger increase in performance when network diversity increases. The lines representing weaker and stronger absorptive capacity are not parallel, thus the interaction effect is present.

FIGURE 3

Interactive effect of network diversity and absorptive capacity

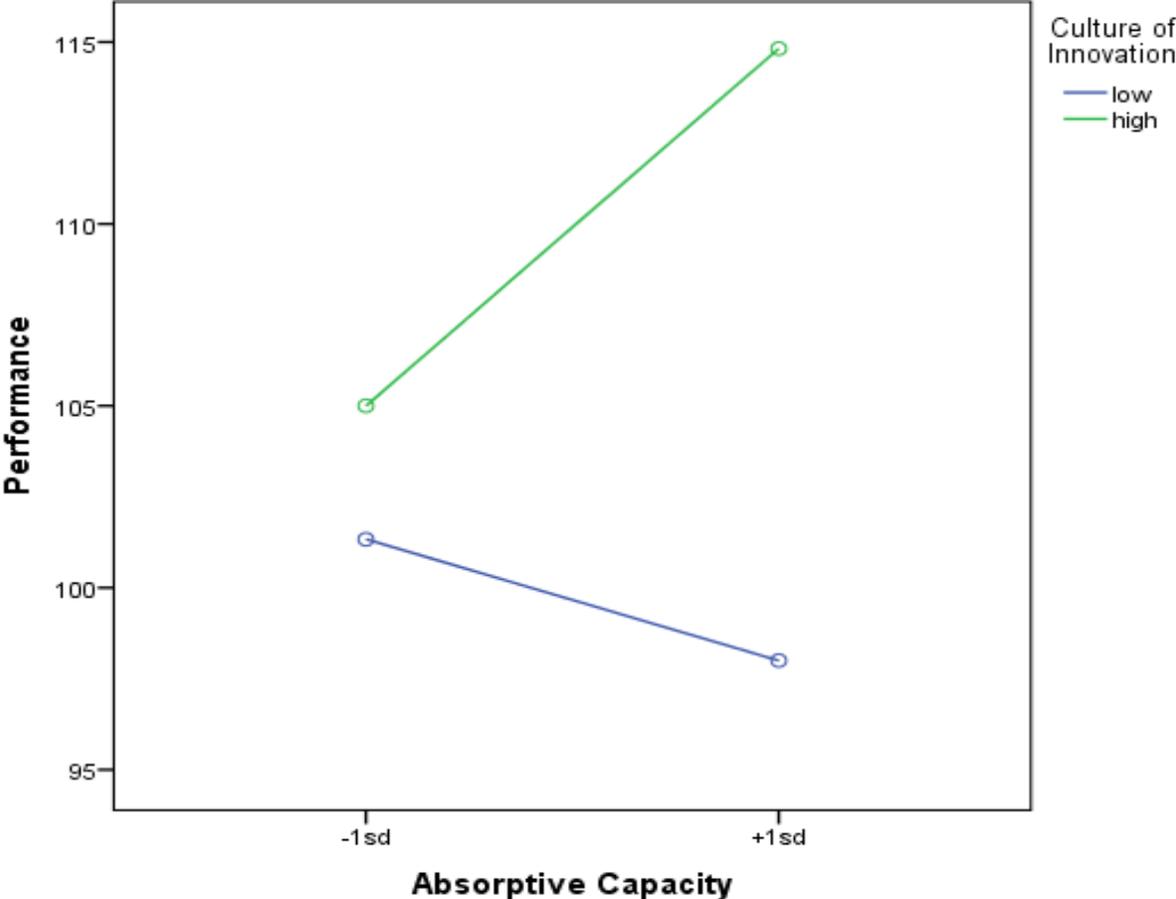


Interactive effect of absorptive capacity and culture of innovation

The plot representing an interactive effect between absorptive capacity and culture of innovation (Figure 4) reveals some interesting findings as well. The plot shows the positive main effect of absorptive capacity on firm performance. Furthermore, the line representing the lower level of culture of innovation (1 standard deviation below the mean) shows no increase in performance when absorptive capacity becomes stronger. The line representing stronger culture of innovation (1 standard deviation above the mean), on the other hand, reveals strong improvement in firm performance when absorptive capacity becomes stronger. Consequently, the plot indicates that the interactive effect between absorptive capacity and culture of innovation is present.

FIGURE 4

Interactive effect of absorptive capacity and culture of innovation



Test for robustness of results

Research recommends using robustness check in order to diagnose potential misspecifications of the regression outcomes (White & Lu, 2010). The robustness check aims to show that the obtained coefficients are “robust”, meaning, they will not significantly change, when the model becomes insignificantly modified. To assess the consistency and robustness of the obtained coefficients, the proposed hypotheses were tested using the second measure of the quality of medical care—patient satisfaction index, which reflects customer perception of the quality of care.

While comparing the obtained coefficients that represent the effect of the independent variables on the two different performance variables, the following observations can be made. First, the sign of all relationships is consistent. Second, the strength of the obtained coefficients are comparable. In some cases, however, some hypothesized relationships become slightly stronger or weaker, which affects their significance. For example, the effect of competition (number of other hospitals in the area) and culture of innovation becomes stronger and significant in Model 1. Most important, consistent with hypothesis 3, the coefficient representing the association between entrepreneurial capacity and firm performance (hypothesis 3) is still positive and statistically significant (standardized $b=.25$, $p<.05$).

Summary of chapter 8

Chapter 8 describes empirical results obtained from testing the data collected at the emergency departments participating in the study. The details of exploratory analysis (e.g., internal validity of constructs, factor analysis, and discriminant validity) are included in Appendix 1

The analyses of descriptive statistics and correlations does not reveal any problems with multicollinearity among the variables included in the model; correlations matrix did not reveal any highly correlated variables. The OLS multivariate regression analyses with robust error clustered at the level of emergency departments were conducted. Results reveal statistically significant regression coefficients suggesting positive relationships between performance and some of the independent variables included in the model. For example, income (median family income in a county where an emergency department is located) was found to be statistically significant. The main effect of network diversity is statistically significant while the effect of absorptive capacity is not. Furthermore, multiple interactive terms are also significant in the context of firm performance. These are the interactive terms between network diversity and absorptive capacity (Network*ACAP), absorptive capacity and culture of innovation (ACAP*Culture). Statistical significance of the interactive terms was also presented by the interactive plots. Three out of five proposed hypotheses are empirically supported by the data, while two hypothesized relationships are not supported.

Moreover, in the context of the main research question, results reveal that entrepreneurial capacity is significantly related to the performance of emergency departments participating in the study.

TABLE 7

Summary of the hypotheses testing

	Hypothesized relationship	Statistically Significant
H1	The relationship between network diversity and organizational performance	<i>Supported</i>
H2	The relationship between absorptive capacity and organizational performance	<i>Not supported</i>
H3	Moderating effect of absorptive capacity on the relationship between network diversity and performance	<i>Supported</i>
H4	Moderating effect of culture of innovation on the relationship between network diversity and performance	<i>Not supported</i>
H5	Moderating effect of culture of innovation on the relationship between absorptive capacity and performance	<i>Supported</i>

CHAPTER 9

DISCUSSION AND CONCLUSION

The objective of this chapter is to discuss the findings of this study and to address the main research questions concerning the role of entrepreneurial capacity and culture of innovation in the process of opportunity exploitation, as well as discuss research contribution and limitations, recommendations, and managerial implications.

Building on existing research, this dissertation introduces and tests a theoretical framework aiming to show *how* and *why* firms can innovate. The dissertation suggests that stronger entrepreneurial capacity increases the likelihood of opportunity exploitation, which should allow firms to remain successful over time. Furthermore, the dissertation also proposes that stronger culture of innovation positively affects the process of opportunity exploitation resulting in superior firm performance.

Summary of results

Statistical results of the hypotheses testing are detailed in the previous chapter (chapter 8). The main proposition of this study (Hypothesis 3) theorizes the positive effect of entrepreneurial capacity on the process of opportunity exploitation. The dissertation proposes that the positive role of entrepreneurial capacity can be conceptualized as the interactive effect of network diversity and absorptive capacity (Network*ACAP). The statistically significant coefficient confirms a positive association between entrepreneurial capacity and firm performance. Consistent with the main proposition of the dissertation, results imply therefore that greater entrepreneurial capacity increases the likelihood of opportunity exploitation resulting in superior firm performance—when firms successfully develop both dimensions of

entrepreneurial capacity, the stronger joint effect results in the larger number of exploited opportunities.

Results reveal statistically significant coefficients for the main effect hypothesis, which assumes a positive relationship between network diversity and performance. The relationship between absorptive capacity and performance is also positive, but not significant. In the context of the model suggested by the dissertation, results indicate that each individual dimension of entrepreneurial capacity is positively associated with the likelihood of opportunity exploitation. Firms allocating their resources into the development of each individual dimension of entrepreneurial capacity may therefore increase the likelihood of their success.

Hypotheses 4, 5 propose the positive effect of culture of innovation on each specific step of the process of opportunity exploitation. Hypothesis 4 suggests a positive moderating effect of the interaction between network diversity and culture of innovation (Network*Culture). Results of the empirical test are positive, but not statistically significant. In the context of the suggested model, these results therefore imply that a stronger culture of innovation may not enable more effective internal dissemination of novel, heterogeneous ideas incoming from external sources. Consequently, this mechanism may not significantly increase the likelihood of opportunity exploitation.

Results of Hypothesis 5 are statistically significant (ACAP*Culture). They reveal that a stronger culture of innovation can reinforce the effectiveness of internal processes responsible for knowledge creation and exploitation. The joint effect of absorptive capacity and culture of innovation is therefore positively associated with the likelihood of opportunity exploitation resulting in superior firm performance.

Impact of the industry on findings

A high volatility of the dynamically evolving external context coupled with a high level of healthcare innovation have turned the healthcare industry into an excellent empirical setting for this study. Research strongly suggests that an industry context could fundamentally affect the relationship between organizational processes and firm performance (e.g., Combs, Lieu, Hall & Ketchen, 2006). While discussing the findings of the study, the industry effect should therefore be addressed.

Research has identified some important industry features that could have affected the outcome of this project. First, research indicates that a constant search for process improvements has become an essential characteristic of the industry struggling to balance the need for providing better quality of service with the need to produce higher financial profits. Research on health care recognizes, therefore, that healthcare innovation is an important factor affecting sustainability of the firms operating in this industry (e.g., Bigelow & Arndt, 2007; Shea & Gresh, 2007). Given these findings, innovation could be more relevant to healthcare organizations than to firms operating in other industries.

Secondly, research points out that the healthcare industry, more so than other industries, is characterized by high interdependence among individual employees and groups. It follows that a high degree of reliance on information sharing and collaborative effort rooted in relational capital is therefore critical in this context (Gittell, Weinberg, Pfefferle & Bishop, 2008). These industry characteristics should be perceived as very relevant in the context of this study, and could potentially influence the outcomes.

Third, research suggests that service-oriented organizations differ significantly from other firms because they focus their operations primarily on the development of processes enabling the

provision of excellent service to customers (Lytle & Schilling, 1994. p. 31). Consequently, more so than other firms, service-oriented firms emphasize quality of interactions with customers, as well as employee discretionary behaviors that are viewed as instrumental in attaining of service quality goals. This feature of health care could impact the results of the study.

Based on the described idiosyncrasies of the healthcare industry, it should be acknowledged that the study's results could be impacted by the industry characteristics. Thus, one can conclude that the study's findings may be easily replicated in some settings, on the other hand, they may be difficult to repeat in other settings, including industries characterized by radically different sets of intrinsic features. For example, the results of the study should be easily repeated in empirical settings, in which the processes of knowledge creations and exploitation are strongly linked to firm performance (e.g., knowledge intense industries, industries with higher level of social interdependencies among employees, for example, team-based work designs).

Summary of findings

The main aim of this dissertation is to conceptualize an alternative framework explaining how firms can increase the likelihood of opportunity exploitation. Findings show that stronger entrepreneurial capacity is positively associated with a higher number of exploited opportunities, resulting in superior firm performance. If properly maintained, greater entrepreneurial capacity should therefore allow a firm to remain successful over time. Consequently, by providing systematic evidence for the positive role of entrepreneurial capacity—the interaction between heterogeneity of external information and the cognitive ability to exploit such heterogeneity of

ideas—this dissertation contributes to the generation of new knowledge explaining *how* firms remain innovative at any stage of their existence.

Building on strategy, entrepreneurship, and network research, this dissertation suggests and tests the hypotheses pertinent to the key stages of the process of opportunity exploitation. The hypothesized relationships theorize the role of entrepreneurial capacity in each of the stages. The core relationships proposed in this dissertation have never been suggested nor empirically tested by previous research. By connecting the likelihood of opportunity exploitation to the joint effect of external and internal mechanisms, this dissertation departs from existing theory, linking a sustained competitive advantage to the path dependent evolution of internal routines. Thus, the proposed model highlights that when combined together, external and internal mechanisms will allow a firm to consider and capitalize on a broader variety of alternative perspectives, thereby challenging a firm's embedded "ways of doing things."

Findings emphasize the importance of heterogeneity of external ties, suggesting the essential role of a firm's openness to the external world; this is consistent with the main assumptions of contingency theory (e.g. Thompson, 1968). Findings imply that by establishing a variety of structural connections capturing heterogeneity of the environment, a firm can become better integrated within the disconnected parts of a loosely coupled system. Such an integration should allow a firm to become better exposed to a variety of alternative social paradigms; ones that often coexist but rarely cross paths. Exposure to competing paradigms, findings suggest, may constitute a critical determinant of a firm's longevity. Conversely, a lack of exposure to such heterogeneity of competing social perspectives may force a firm to operate within the boundaries of a single paradigm. Strong dependence on a single socio-economic model may become destructive because, as emphasized by Dorothy Leonard-Barton (1992), it may reinforce

internal core rigidities. Internal rigidities of the system could lead to its failure, when a strongly endorsed paradigm becomes obsolete and rejected by the external world. This may lead to a firm's demise.

Sole openness, or broader exposure to a wider range of alternative perspectives representing alternative understanding of the world, may not however allow a firm to reap full economic benefits. In order to do so, findings suggest, a firm must develop a high level of entrepreneurial capacity, which allows to draw from, and then appropriate a wide range of alternative viewpoints. Otherwise, an aging firm will be unable to appreciate the heterogeneity of different perspectives and thereby lose its ability to capitalize on the implications of the changing world.

The second part of the dissertation focuses on the role of culture of innovation. Findings suggest that the development of strong normative pressure intended to induce homogeneity of employee behaviors within a firm may have a positive impact on some stages of the process of opportunity exploitation. When a culture of innovation motivates employees to engage in innovative behaviors, such a culture may positively affect organizational mechanisms responsible for knowledge creation. This implies that congruence between organizational level processes of knowledge creation and individual behaviors focusing on knowledge creation may jointly reinforce a firm's innovative capabilities. Consequently, a strong culture of innovation should be particularly beneficial for those firms that aim to increase the strength of their knowledge utilization competencies. However, findings suggest that culture of innovation, may not significantly reinforce the effectiveness of network diversity in the context of opportunity exploitation. This implies that when a firm develops access to a wide range of external ideas, it

may not become beneficial to further elicit strong employee engagement in activities that focus on internal searches for alternative problem solutions.

Individual effects of network diversity and absorptive capacity

This dissertation posits that individually each of the two dimensions of entrepreneurial capacity can positively affect the process of opportunity exploitation. The results confirm the proposition.

Few theoretical and empirical studies analyzing the relationship of network diversity and performance exist. Those studies offer conflicting findings, as both positive and negative results are reported (Goerzen & Beamish, 2005; Powell, Koput & Smith-Doerr, 1996). Researchers posit that the impact of heterogeneity of networks may depend on the industry setting. For example, in the case of multinational corporations operating in global markets, the costs associated with the development of diverse ties were found to be too high (Goerzen & Beamish, 2005). By contrast, this dissertation reveals a positive role of network diversity in the process of opportunity exploitation (Model 3). Taking into account the empirical setting, findings of the study may indicate that firms operating in a single industry located in one country could benefit from the diversity of external partnerships.

Findings suggest that by merely broadening exposure to external ideas, a firm increases its ability to exploit new opportunities. This positive association between network diversity and firm performance could indicate that, while being exposed to a wider range of novel information, or facing a broader range of alternatives, organizational units may be able to select some process improvement ideas pertinent to the effectiveness of their operations. Without strong absorptive capacity—the ability to fully comprehend the meaning of novel ideas—this process may be

however somewhat driven by blind chance, thereby resembling a “trial and error” approach. This may increase the risk of committing diagnostic errors (type I and type II errors). As a result, a firm may implement some good process improvement ideas, while many other valuable improvement opportunities will be missed, because a firm lacks internal capacity to recognize their utility. In sum, in the context of health care, findings suggest that emergency departments with stronger network diversity implement more healthcare innovations, resulting in better quality of medical care.

Theoretical and empirical studies suggest the positive role of absorptive capacity in the context of firm performance (e.g., Volberda, Foss & Lyles, 2010). This positive association has also been suggested in the context of health care (e.g., Easterby-Smith, Graça, Antonacopoulou, & Ferdinand, 2008). The positive role of absorptive capacity in the framework of opportunity exploitation has never before been conceptualized nor tested. The results of statistical testing reveal no statistically significant positive role of absorptive capacity in the process of opportunity exploitation (Model 5). The coefficient representing the effect of absorptive capacity on performance is however positive and strong. It becomes statistically significant when culture of innovation is removed from the model. Findings could therefore suggest that *ceteris paribus* firms with stronger cognitive ability exploit more new opportunities than firms with weaker absorptive capacity.

Limited openness to new emergent trends should noticeably reduce the number of new opportunities that a firm can exploit. Without learning about new external developments, a firm will not be able to consider the impact of a broad scope of environmental changes. Strong internal cognitive ability should, however, enable a firm to reduce the number of diagnostic errors (type I and type II) and correctly foresee how novel configurations of internal resources

may result in higher efficiency. Thus, findings may suggest that firms with greater absorptive capacity may have to strongly rely on their internal processes to create some new alternative improvements. In such case, the process of opportunity creation seems therefore more likely than the process of opportunity discovery.

In the context of healthcare, strong internal cognition allows emergency departments to correctly recognize the need for critical process improvements. Emergency departments with strong absorptive capacity wisely implement the process improvements only when such change is really needed; this results in better quality of medical care.

Effect of entrepreneurial capacity

The positive role of entrepreneurial capacity during the process of opportunity exploitation is the main finding of this study. The framework of opportunity exploitation has previously been theorized and successfully tested in empirical studies (e.g., Dencker, Gruber & Shah, 2009; Shane & Venkataraman, 2000). This dissertation goes a step further, as it introduces the concept of entrepreneurial capacity to explain how a firm can increase the likelihood of exploiting opportunity that will result in superior performance. Model 5 empirically tests the full effect of entrepreneurial capacity on the process of opportunity exploitation. It reveals a statistically significant coefficient. The positive role of entrepreneurial capacity during the process of opportunity exploitation is therefore supported, which should be viewed as the main contribution of the study.

Findings suggest that when a firm can develop access to a broad spectrum of heterogeneous ideas and a strong cognitive ability to capitalize on this heterogeneity of ideas, such a firm increases the likelihood of opportunity exploitation. In the context of the main

research question, findings suggest that when continuously upgraded, stronger entrepreneurial capacity should allow firms to innovate over time, regardless of their organizational age.

The study proposes that strong entrepreneurial capacity allows a firm to benefit from a wide array of new alternatives because a firm can foresee how such alternatives could be applied to improve its internal processes. Consequently, due to stronger entrepreneurial capacity, firms will not have to rely as much on “trial and error,” as they can reduce the risk of committing type I and type II errors. As a result, firms with strong entrepreneurial capacity do not use their scarce internal resources in an attempt to exploit “bad” opportunities, which could generate economic losses. By being less “ignorant,” while introducing internal improvements, firms with stronger entrepreneurial capacity should be able to preserve the strength of their core resources and introduce new ideas only when the key organizational capabilities must be truly amended to perpetuate superior performance in the future.

Effect of culture of innovation

Very few studies investigate the links between organizational culture and network diversity, and between organizational culture and absorptive capacity. Current research has suggested a positive relationships between the constructs; it proposes that when a culture elicits stronger employee engagement in innovative behaviors, such a culture should be positively associated with a firm’s ability to develop external partnerships (Beugelsdijk, Koen & Noorderhaven, 2006). Moreover, research suggests, stronger employee engagement in innovative behaviors should positively affect a firm’s innovative capabilities (Harrington & Guimaraes, 2005). In the attempt to explain the likelihood of opportunity exploitation no associations among these constructs have been previously suggested.

The coefficient representing the interactive effect of network diversity and culture of innovation on performance is positive, but not significant. Results of statistical testing did not therefore support the positive effect of relationship between culture of innovation and network diversity in the context of opportunity exploitation (Model 6). Thus, findings imply that when a firm is exposed to a very broad range of novel, alternative ideas, stronger employee engagement in innovative behaviors can be only somewhat effective. When a firm is already exposed to a wide array of new external ideas, focusing employee behaviors on activities that aim to support internal searches for new process improvements may not yield expected organizational benefits. Findings could therefore imply that, in order to capitalize on a wide array of new heterogeneous ideas, a firm may try to focus employee behaviors on those activities that facilitate more effective utilization of existing competencies.

The assumption that stronger employee engagement in innovative behaviors should reinforce the effectiveness of a firm's ability to exploit new opportunities seems theoretically sound. Findings may however signal that a firm's excessive focus on reinforcing its innovative capabilities could become detrimental, as a strong singular focus on the development of innovative capabilities may negatively influence the effectiveness of other organizational functions. The possible implication is that there is a limit of how much a firm can develop its innovative capabilities without compromising the effectiveness of the other well performing competencies. It is recommended that future research examines whether or not there could exist an "optimal level" of innovation that a firm should try to introduce. Further research with the goal to explain this interesting relationship could enhance our knowledge regarding the microeconomic foundations of the process of opportunity exploitation.

Results of statistical testing reveal a statistically significant relationship between culture of innovation and absorptive capacity (Model 7). This moderating effect has never previously been theorized nor empirically tested in the context of opportunity exploitation. Results show that stronger employee engagement in innovative behaviors should reinforce the role of absorptive capacity in the process of opportunity exploitation. Findings therefore suggest that a strong culture of innovation increases the effectiveness of the processes responsible for knowledge transfer, creation and exploitation. When employees become more engaged in collaborative effort and open communication, such behaviors may facilitate better externalization of tacit knowledge, enable a more effective merger between new information and existing stocks of knowledge, and better dissemination and utilization of newly created knowledge within a firm. Findings therefore support the model of knowledge creation proposed by Zahra and George (2002), in which social mechanisms reinforce the effectiveness of knowledge transformation and exploitation. A further examination of the role of social interactions in the process of opportunity exploitation could expand our understanding of the key mechanisms responsible for the process of knowledge exploitation.

Research contribution

Bacharach (1989) defines theory as a “statement of relations among concepts within a set of boundary assumptions and constraints” (1989, p.496). Eisenhardt (1989) posits that theory development should be perceived as the main objective of organizational research. Theory development, the author suggests, could be driven by synthetic analysis of findings from previous research, common sense, and experience.

Scholars agree that good quality research should promote theory advancement, which happens when a study introduces new, theoretically sound explanations of *how* and *why* the hypothesized associations between constructs exist. Providing alternative explanations that have not been considered by previous studies have been therefore widely acknowledged as critical benchmarks of theoretical contribution (Van de Ven, 2007; Bacharach, 1989; Whetten, 1989).

In his seminal paper, Whetten (1989) explains what it means to propose the alternative *how* and *why*. The introduction of alternative mechanisms and justifications that have not been previously considered by research does not simply involve, Whetten stresses, the identification of new variables, new moderating variables, or new boundary conditions. Theoretical contribution requires novelty that aims to challenge previously accepted understandings of how analyzed relationships could actually operate. Consequently, meeting the requirement of theory contribution involves providing logically justified new explanations of *how* and *why* relationships between constructs can be theorized. Given the previously discussed research recommendations, the following section of the study illustrates how this dissertation contributes to theory development.

First, by introducing the concept of entrepreneurial capacity, the dissertation provides an alternative explanation of why firms could successfully maintain a sustainable competitive advantage over time. Drawing from the existing literature (Zahra & George, 2002; Teece, Pisano & Shuen, 1997; Barney, 1991; Thompson, 1968; Penrose, 1959), the dissertation theorizes that entrepreneurial capacity allows firms to understand and capitalize on a wide range of external perspectives, it thereby facilitates an ongoing process of innovation. The existing literature focuses on showing that heterogeneity of internal resources generates superior performance (e.g. Barney, 1991). It does not however explain how heterogeneity of external connections can alter

the path-dependent, embedded assumptions that can effectively restrict an evolution of organizational logic. Conversely, the dissertation proposes that entrepreneurial capacity enables a firm to increase the scope of alternatives it can consider in order to build the congruence between changing external expectations and the effectiveness of internal operations. Thus, it proposes that entrepreneurial capacity may increase the likelihood of creating new value, while at the same time avoiding competency traps and the development of core rigidities (e.g. Leonard-Barton, 1992; March, 1991).

Secondly, research on entrepreneurship has been engaged in a long-lasting debate aiming to resolve whether or not new opportunities should be viewed as discovered or created (Alvarez, Barney & Anderson, 2013; Klein, 2008). This debate about the source of new opportunities is deeply rooted in intellectual discourse initiated by Greek philosophers thousands years ago. These philosophers disputed whether or not ideas could exist independently of the human mind. Recognizing the futility of this unresolvable debate, the dissertation focuses on presenting an integrative approach, which recognizes that new opportunities can be both exogenous and endogenous. As a result, the dissertation aims to refocus the debate on the most important aspect of entrepreneurship—finding the effective mechanisms that can maximize the likelihood of opportunity exploitation. As this dissertation proposes, this will take place when a firm develops strong entrepreneurial capacity.

Employee-level assessments of firm-level constructs have received considerable research attention, especially as an important predictor of employee behaviors (Kozlowski & Klein, 2000). Research reinforces the importance of the link between microeconomic predictors and firm-level outcomes. This dissertation contributes to research by explaining the role of cultural factors eliciting individual employee behaviors in the context of the firm level process of

opportunity exploitation. The study provides a new, alternative explanation of how cultural factors eliciting individual behaviors interact with each of the dimension of entrepreneurial capacity, thus how they affect the likelihood of opportunity exploitations. Existing research has conceptualized the positive role of employee behaviors in the context of firm-level innovations (e.g. Scott & Bruce, 1994). Conversely, findings of this study suggest that firm performance may suffer when a firm excessively concentrates on the development of its innovative capabilities.

Finally, this study contributes to research on healthcare management. Chapter 3 of the dissertation describes a variety of socio-economic factors that have turned the healthcare industry into a very important setting for empirical studies. Taking into consideration the important economic and political role of the industry, research that focuses on healthcare innovation can be viewed as especially meaningful. While research on health care has already recognized many different predictors of healthcare innovation, the need to identify alternative factors that can account for variation in performance across units is still strong (e.g., Avgar, Givan & Liu, 2010). Thus far no studies on healthcare innovation have looked at the role of heterogeneity of external sources of novel ideas, or the interactive effect of absorptive capacity and network diversity in the context of health care innovation. Consequently, this dissertation presents a new alternative framework explaining variation in a quality of care provided by healthcare organizations. In this way, the dissertation directs research attention to new predictors that should be further investigated in the context of firm performance.

Contribution to practitioners

According to Van de Ven (2007) good research should aim to include some practical recommendations that practitioners may consider. Although no causality between concepts can

be claimed in this cross-sectional design study, the study nevertheless reveals some important associations that link a set of firm-level variables to firm performance. Findings regarding the role of heterogeneous external contacts, absorptive capacity and cultural norms could therefore prompt managers to consider further development of these factors when firm performance is lacking.

For all managers, and particularly, those managers who work in established firms that systematically lose their competitive edge, the study clearly identifies organizational competencies that could be responsible for a firm's increasing inertia. Thus, the study points out that in order to reinvigorate a firm's entrepreneurial spirit, managers may want to closely assess the strength of entrepreneurial capacity, and come up with some actions addressing its potential shortcomings. For younger firms, the current study prescribes that managers should closely monitor the level of entrepreneurial capacity, as it can delimit the strength of a firm's innovative capabilities in the future.

Furthermore, the study recommends that close attention should be given to establishing a proper balance among three critical competencies affecting the strength of a firm's innovative capabilities: diversity of external ties, a firm's cognitive ability, and employee innovative behaviors. Findings imply that managers should carefully consider to what extent their firms should encourage employee engagement in innovative behaviors. In the context of opportunity exploitation, the study suggests that strong employee focus on a search for new solutions may not benefit firm performance. Managers should therefore consider balancing employee innovative behaviors with other behaviors that could support already established and well performing organizational functions.

Because the study is strongly embedded in the context of health care, findings of the dissertation send especially important signals to managers working in healthcare organizations. By linking quality of medical care to the interaction among heterogeneity of network connections, absorptive capacity and organizational culture of innovation, the study can prompt managers to assess the strength of the three critical firm-level factors and take all necessary steps to keep them current.

Research limitations

While designing an empirical study, scholars must consider certain tradeoffs affecting results of empirical testing. Satisfying all, often conflicting research requirements, such as parsimony and comprehensiveness of the model may be difficult, and thereby may create research limitations (Eisenhardt, 1989; Whetten, 1989). Scholars should recognize and address these limitations. The following section of the study addresses such limitations, namely, problems of endogeneity, cross-functional design, and the potentially limited generalizability of findings.

Scholars suggest that endogeneity bias should be recognized as one of the main research problems (Heckman, 1974). According to the author, endogeneity inflates obtained regression coefficients due to undesirable correlations between the independent variables and the error term present in the model. While proposing new theoretical associations among some constructs, scholars make assumptions regarding a causality between the variables. Assumptions of causality often take place in research on networks and social capital, in which a causal relationship between social structure and firm-level outcomes is often proposed and empirically tested (e.g., Burt, 1992; Granovetter, 1985). While many scholars claim the causality between network

structure and internal firm outcomes, such causal relationships can be inflated due to the endogenous character of the relationship (Reagans, Zuckerman & McEvily, 2004). For example, in the present study network diversity is theorized as exogenous to a firm, thus, the causality between network diversity and a firm's innovative capabilities could be proposed. In reality, however, the differences in the level of network diversity across firms may depend on a firm's intrinsic characteristics, established processes, and other endogenous factors that determine why some firms are successful at establishing external connections. Consequently, in this dissertation, the endogeneity problem should be recognized. It may imply that more innovative firms have developed some endogenous traits allowing them to build heterogeneous network and not *vice versa*. Potential endogeneity bias could suggest, therefore, that the directions of associations hypothesized in the model could be reversed.

Research suggests appropriate methods to control for potential bias created by endogeneity. Thus, the two step "Heckman procedure" or "Heckman correction" has been widely recommended (Heckman, 1974). Heckman prescribes using a set of instrumental variables to effectively solve the endogeneity problem. These instrumental variables must be uncorrelated with the dependent variable, furthermore, they must be correlated with the endogenous variable. Consequently, instruments allow to control for spurious relationships between the endogenous variable and the dependent variable eliminating endogeneity bias.

The dataset used to empirically test the model, unfortunately, does not contain any instruments that could substitute the construct of network diversity. Therefore, the Heckman procedure cannot be performed to attenuate the bias. It should be recommended that future research considers including variables that could allow to apply the Heckman procedure and test the proposed model without endogeneity bias.

Research on strategy recognizes some limitations related to the cross-sectional character of research design (e.g., Bowen & Wiersema, 1999). Thus, cross-sectional data collected from subjects at the same time, may create a potential for biased inferences. Furthermore, as suggested by Bowen and Wiersema (1999), findings regarding relationships tested by using cross-sectional data may be strongly impacted by inherent firm-specific mechanisms. In such a case, no statement about the general applicability is recommended, because findings may be somewhat inflated by characteristics specific only to firms included in the sample (Bowen & Wiersema, 1999). Because the potential for bias stemming from cross-sectional methods used to empirically test the present model could be present in this study, this dissertation makes no claims regarding a causality between the independent and dependent variables. The study's results, however, strongly indicate that the linear association among the variables used in the study exist.

As outlined earlier, this study aims to develop a general theoretical proposition explaining how a firm-level mechanisms jointly facilitate the process of opportunity exploitation regardless of the industry setting. In such a context, empirical tests based on the data representing only one industry could somewhat limit generalizability of the findings. For example, in some more knowledge intense industries, where information sharing and interdependencies between organizational functions are stronger, the effect of culture of innovation could be more salient. In such a context (a knowledge intense setting), the empirical test of the proposed model could be further reinforced, and thus could produce stronger coefficients. In other industries (e.g., where the creation of new knowledge does not play an important role), the obtained coefficients may be however weaker. More empirical testing of this model in various single-industry settings, as well as some cross-industry studies could refine our understanding of how contextual antecedents can affect the process of opportunity exploitation.

In sum, future research based on the longitudinal design using a multilevel panel data representing a very large sample of firms operating in various industries located in multiple global markets is highly recommended. Such a research design could allow the alleviation of the apparent shortcomings of this study. Furthermore, such future research could allow scholars and practitioners to better untangle the complexity of various individual and firm-level factors jointly influencing the process of opportunity exploitation.

Conclusion

Building on the existing literature, this dissertation introduces the new concept of entrepreneurial capacity, and explains how this integrative mechanism can enable a firm to remain successful at any stage of its existence. The dissertation empirically tests the novel theoretical framework that shows how greater entrepreneurial capacity increases the likelihood of exploiting new opportunities that result in superior firm performance. Results of empirical testing confirm the positive role of entrepreneurial capacity (network diversity coupled with absorptive capacity) and culture of innovation during the different stages of the process of opportunity exploitation.

The dissertation contributes to research by showing that entrepreneurial capacity could represent an organizational “fountain of youth.” Findings imply that a firm may remain successful over time, when a firm is open to the world and maintains its strong cognitive ability to capitalize on the heterogeneity of external socio-economic paradigms that often coexist in the environment but rarely cross paths. The dissertation suggests therefore that the interaction between those two mechanisms could be viewed as a source of a sustained competitive advantage. The process takes place because stronger entrepreneurial capacity provides a firm

with a wider scope of new alternatives that can challenge existing organizational processes, and can generate improvements increasing the effectiveness of a firm's internal operations.

It should be noted that the study is one of a very few empirical attempts that have examined the joint impact of structural, cognitive and cultural factors in the context of opportunity exploitation. I hope that, by focusing research attention on the role of the factors included in the proposed model, this dissertation will facilitate further theoretical and empirical developments in the field of strategy and entrepreneurship.

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Agency for Healthcare Research & Quality

<http://www.ahrq.gov/research/findings/nhqrdr/nhqrdr10/qdr10.html>

Centers for Medicare and Medicaid Services

<http://www.cms.gov/>

Committee on Identifying and Preventing Medication Errors Research

http://www.nap.edu/catalog.php?record_id=11623

Commonwealth Fund Commission on a High Performance Health System

<http://www.commonwealthfund.org/About-Us/Commission-on-a-High-Performance-Health-System.aspx>

Congressional Budget Office

<http://www.cbo.gov/>

Institute of Medicine

<http://www.iom.edu/>

Institute for Healthcare Improvement

<http://www.ihl.org/Pages/default.aspx>

Institute for Family Centered Care

<http://www.ipfcc.org/>

International Profiles of Health Care Systems

Commonwealthfund.org

The Organization for Economic Co-operation and Development (OECD)

<http://www.oecd.org/statistics>

World Health Organization

<http://www.who.int/research/en/>

World Bank

<http://data.worldbank.org/use-our-data>

APPENDIX A

EXPLORATORY DATA ANALYSIS

Exploratory data analysis can early on identify potential problems with data used to empirically test the model. This analysis is therefore instrumental in improving a data-model fit. First, it determines whether or not a fit between data and model is sufficient, second, it identifies which items or observations should be eliminated from the dataset to strengthen the fit. Consequently, when problems identified during exploratory data analysis are solved, results of the statistical testing reveal more accurate and less biased coefficients representing associations between the variables (Hoaglin, Mosteller & Tukey, 1983). Based on research recommendations, the following section of the chapter presents results of exploratory data analysis, which include the Bausch-Pagan test for homoscedasticity, the Shapiro-Wilks test for normality, graphical representations of the data distribution, as well as confirmatory and discriminant validity testing.

Data homoscedasticity

The assumption of data homoscedasticity, or homoscedasticity of variance is one of the critical assumptions in statistics (Hays, 1973). Homoscedasticity assumes that the dependent variable will display the consistent level of variance across the different level of values for independent variables used to predict the level of dependent variable. Violation of the assumption of homoscedasticity results in biased coefficients.

There are several statistical tests that may be used to determine whether or not the level of homoscedasticity of variance is acceptable. One of the most popular tests for homoscedasticity is the Bausch-Pagan test, in which the null hypothesis assumes that variance is homogeneous—the level of variance of the dependent variable is equally distributed across

groups defined by independent variables. When the test reveals results as statistically significant ($P > 0.05$), the null hypothesis is rejected, thus demonstrating that the assumption of homoscedasticity is violated. In such a case, the variance should be deemed as unequally distributed.

TABLE 8

The Bausch-Pagan test for heteroscedasticity

F	d.f.	Prob>F
1.13	(1,69)	0.29

Results of the Bausch-Pagan test reveal that the probability is higher than the level of significance ($P > 0.05$). Results indicate therefore that the null hypothesis cannot be rejected. Variance in the data used to test the proposed hypotheses is homogeneous, thus it does not violate the assumption of homoscedasticity.

Normal distribution of the data

Tests for data normality are critical, as normality of the data distribution is an underlying requirement for statistical testing (Hays, 1973). Hays distinguishes the two main methods of assessing data normality. These methods are graphical (visual) representations of data, and test (numerical) assessments. Results associated with statistical testing are deemed as more objective, but are highly dependent of a sample size, showing less sensitivity in the case of smaller samples, and more when large samples are used (Hays, 1973).

There are several tests assessing whether or not data are normally distributed. The most common among the tests are the Kolmogorov-Smirnov and Shapiro-Wilk tests. According to Royston (1982), the Shapiro-Wilk test should be recommended for samples larger than 50 observations ($N > 50$). The Shapiro-Wilk test for normality estimates the probability that data used to test hypotheses was drawn from a normal population. When the null hypothesis is rejected (p -value is statistically significant), results indicate that the data may significantly differ from a normal population. In such a case, it violates the assumption of normality

TABLE 9

The Shapiro-Wilk test for normality

	W	V	z	Prob>z
Culture of Innovation	0.97727	1.415	0.756	0.22488
Absorptive Capacity	0.97491	1.562	0.971	0.16574
Network Diversity	0.97692	1.437	0.789	0.21512

The Shapiro-Wilk test for normality revealed that the W statistics are not statistically significant. Results suggest therefore that the data used to test hypotheses are compatible with a normal distribution, thus the assumption of normality is met.

Residual versus fitted

Plot of residual vs. fitted values is the most frequently used graphical representation of data distribution. The residual vs. fitted plots allow to detect potential problems with the normal distribution, linearity, unequal error variances, and outliers (Cohen & Cohen 1983).

FIGURE 5

Network diversity: Residual versus fitted values

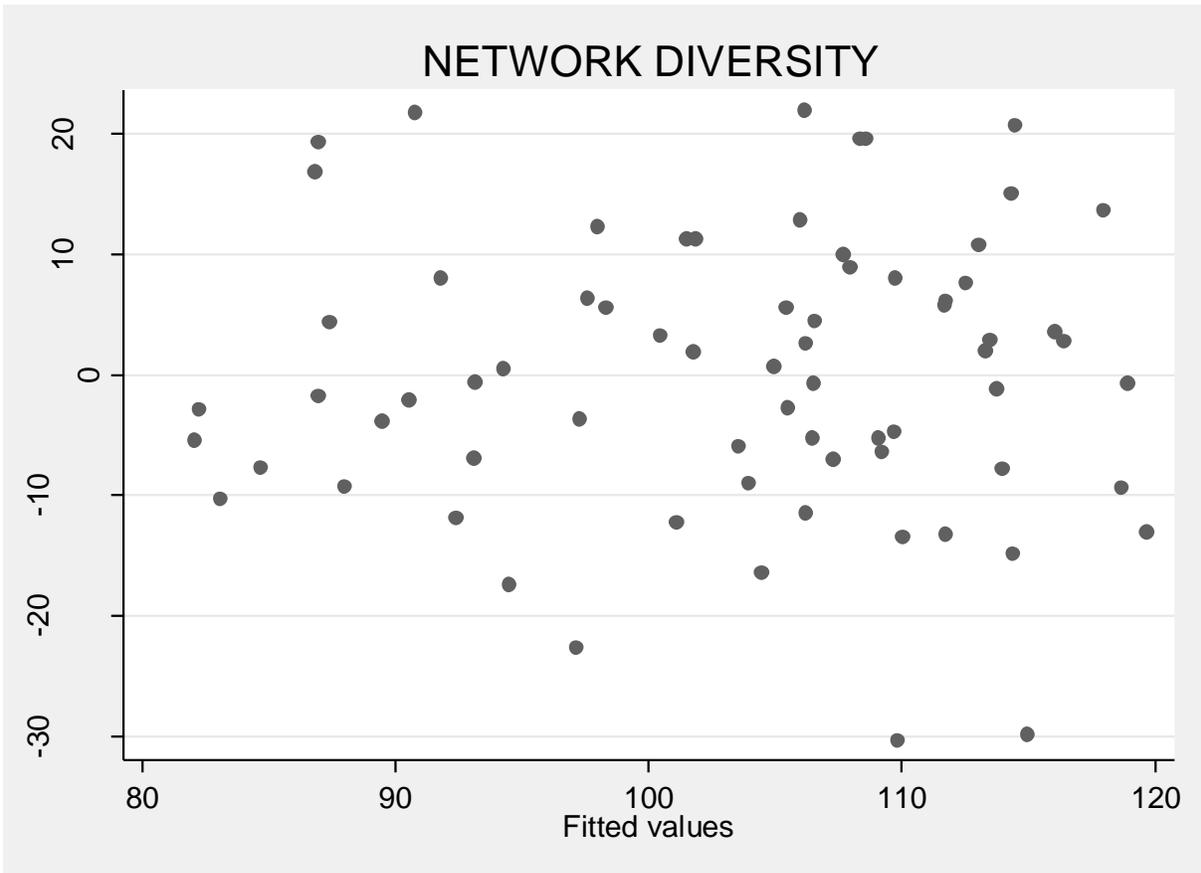


FIGURE 6

Absorptive capacity: Residual versus fitted values

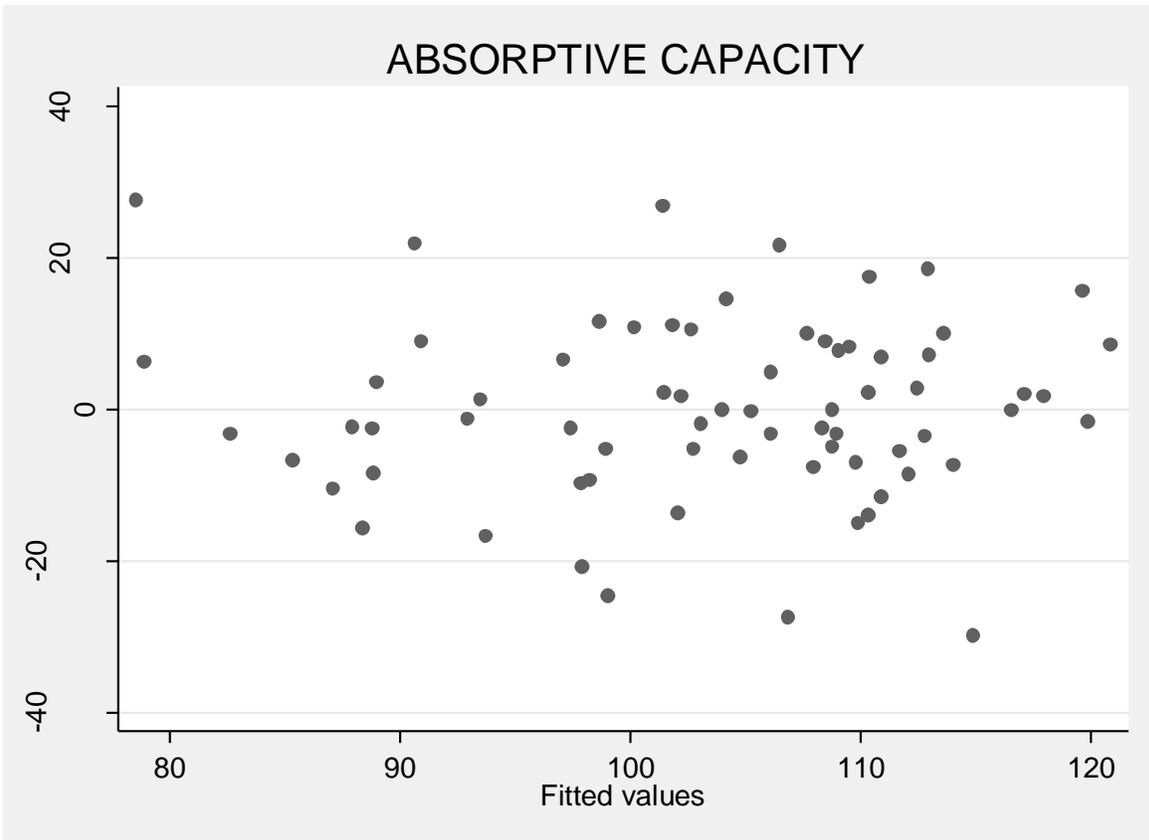
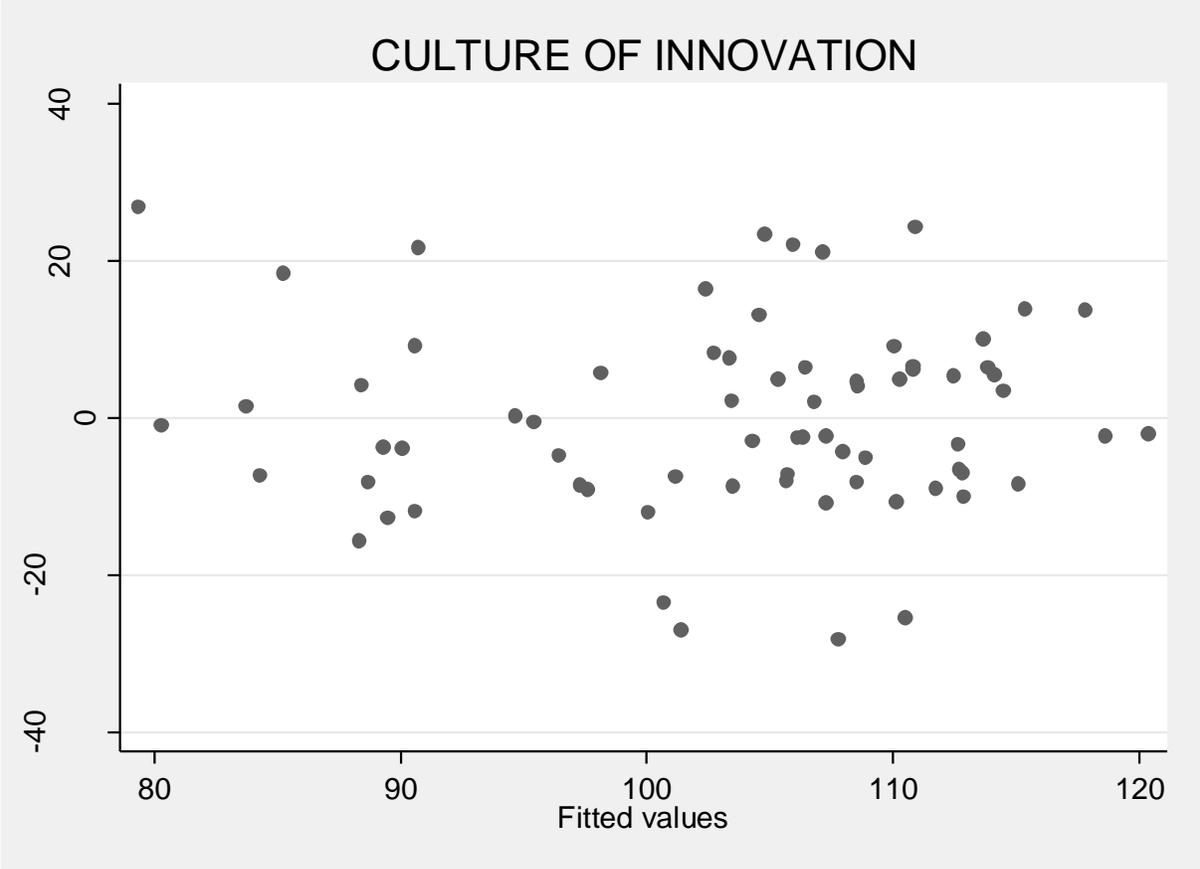


FIGURE 7

Culture of innovation: Residual versus fitted values



Residual vs. fitted plots reveal that the data distribution is normal, also indicating that there is a linear relationship between the predictors and the outcome variable used in the model. Plots reveal no unusual data points in the dataset, as the points on the plots appear to be randomly scattered around zero. Therefore, the assumption that the error terms have a mean of zero is justified. The vertical width of the scatter plots doesn't seem to significantly decrease or increase across the point signifying zero. It can be therefore assumed that the variance in error terms is consistent. Based on these graphical visualizations, the data used in this study meet critical requirements necessary for further testing.

Internal consistency of the measures

Research views validity and reliability of measurements as a core assumption of any statistical analysis (Nunnally, 1978). The author explains that validity refers to the extent to which an instrument used to measure a construct can actually assess what was intended, while reliability of measurements pertains to the instrument's ability to measure a construct consistently over time or regardless of the context.

Research suggest that the internal consistency of the measurements should be evaluated before statistical analyses are conducted. This assessment may help to reduce errors associated with measurements of latent constructs. Cronbach's alpha has become a commonly accepted statistic, which aims to measure internal consistency within latent constructs composed of multiple items (Cronbach, 1951). This statistic is expressed as a number in the range between 0-1, in which the higher number indicates a desired, stronger internal consistency within the instrument.

In a case when a study uses multiple raters evaluating a group-level construct, research recommends using the intraclass correlation coefficient (ICC) to assess consistency among multiple raters, when a fixed degree of relatedness among the raters exist (Bliese, 2000).

Cronbach's alpha

Research recommends that Cronbach alpha should be higher than .70 (Nunnally, 1978). In this dissertation, Cronbach's alpha was calculated for the two latent independent variables used in the model.

TABLE 10

The internal consistency of absorptive capacity

Item	Item-test correlation	Item-rest correlation	Alpha
Absorptive Capacity 1	0.6641	0.6079	0.8626
Absorptive Capacity 2	0.5813	0.5126	0.8658
Absorptive Capacity 3	0.6014	0.5380	0.8650
Absorptive Capacity 4	0.5907	0.5301	0.8630
Absorptive Capacity 5	0.4804	0.3910	0.8464
Absorptive Capacity 6	0.4914	0.4227	0.8590
Absorptive Capacity 7	0.4416	0.3707	0.8703
Absorptive Capacity 8	0.2915	0.2174	0.8744
Absorptive Capacity 9	0.5352	0.4803	0.8673
Absorptive Capacity 10	0.4991	0.4430	0.8683
Absorptive Capacity 11	0.5708	0.5172	0.8661
Absorptive Capacity 12	0.4979	0.4299	0.8785
Absorptive Capacity 13	0.6238	0.5582	0.8642
Absorptive Capacity 14	0.5471	0.4927	0.8668
Absorptive Capacity 15	0.3820	0.3015	0.8756
Absorptive Capacity 16	0.4958	0.4431	0.8684
Absorptive Capacity 17	0.4890	0.4431	0.8434
Absorptive Capacity 18	0.5716	0.5114	0.8690
Absorptive Capacity 19	0.4433	0.3492	0.8723
Absorptive Capacity 20	0.5066	0.4477	0.8680
Absorptive Capacity 21	0.5606	0.5013	0.8664
Absorptive Capacity 22	0.4579	0.3850	0.8699
Absorptive Capacity 23	0.5878	0.5278	0.8655

Test scale

0.8730

TABLE 11

The internal consistency of culture of innovation

Item	Item-test correlation	Item-rest correlation	Alpha
Culture of Innovation 1	0.5800	0.4944	0.8579
Culture of Innovation 2	0.6054	0.5321	0.8561
Culture of Innovation 3	0.6349	0.5562	0.8546
Culture of Innovation 4	0.5592	0.4747	0.8588
Culture of Innovation 5	0.6039	0.5204	0.8565
Culture of Innovation 6	0.6378	0.5557	0.8546
Culture of Innovation 7	0.5494	0.4665	0.8591
Culture of Innovation 8	0.5196	0.4360	0.8605
Culture of Innovation 9	0.6629	0.5877	0.8529
Culture of Innovation 10	0.5290	0.4457	0.8601
Culture of Innovation 11	0.5996	0.5266	0.8564
Culture of Innovation 12	0.6199	0.4222	0.8518
Culture of Innovation 13	0.6605	0.5890	0.8531
Culture of Innovation 14	0.5412	0.4597	0.8594
Culture of Innovation 15	0.6220	0.5444	0.8552

-----+-----
Test scale |0.8654

The Cronbach's alpha coefficient for absorptive capacity was .8730. For culture of innovation, the obtained alpha was .8654. Both values therefore exceed recommendations suggested by previous research (Nunnally, 1978). Consequently, sufficient internal consistency among the items comprising the measures of absorptive capacity and culture of innovation is established. Both scales should be viewed as valid measures of the latent constructs used in the study.

Intraclass correlation coefficient (ICC)

When multiple raters evaluate a latent construct, “shared” variance, or some level of consistency among raters should be expected, because it represents the degree of relatedness among raters’ perception of a group-level phenomena. No correlation between individual perceptions among the raters could indicate that measures of a latent constructs are not reliable (Bliese, 2000).

Research recommends using the intraclass correlation coefficient (ICC) when multiple raters evaluate a group-level construct (Bliese, 2000). The author defines the ICC coefficient as a measure of the degree to which individual responses provide reliable estimation of the aggregated construct. For example, when a group of employees working together are asked to evaluate a latent firm-level phenomena, such as a culture, some level of consistency in raters’ perception is necessary to establish reliability of the measure. ICC statistic can range from 0-1. Research distinguishes two kinds of the intraclass correlation coefficient. These are ICC (1) and ICC (2) (Bliese, 2000). The ICC (1) is defined as a measure of an absolute agreement among raters. Bliese recommends that the level of ICC (1) should fall within the range from 0 to 0.5. The author also points out that the typical range of ICC (1) obtained from empirical studies fall between 0.05 and 0.20 with 0.12 being the median (Bliese, 2000). ICC (2) allows to assess the reliability of a mean rating (or an aggregated score). Research suggests that ICC (2) should be higher than ICC (1), and the value of 0.70 should demonstrate acceptable inter-rater reliability (Bliese, 2000). According to empirical studies, however, ICC (2) coefficients are often low, which could be a function of small sample of raters representing a large population (Nishii, Lepak, & Schneider, 2008; Bliese, 2000).

Using STATA 12, the intraclass correlation coefficients, ICC (1) and ICC (2), were calculated for the latent independent variables included in the study:

TABLE 12

Absorptive capacity: Intraclass Correlation Coefficient (ICC)

	Interclass correlation	F	Prob>F
Single measure (ICC 1)	0.29	5.5	0.029
Average measure (ICC 2)	0.81		

TABLE 13

Culture of innovation Intraclass Correlation Coefficient (ICC)

	Interclass correlation	F	Prob>F
Single measure (ICC 1)	0.32	8.4	0.009
Average measure (ICC 2)	0.86		

Results reveal an acceptable level of the coefficients (ICC 1 and ICC 2) for both variables: absorptive capacity and culture of innovation. Recommendation of inter-rater reliability is therefore met, as the estimated correlation coefficients range from 0.29 to 0.32., indicating sufficient covariance in the raters' evaluation of the constructs. The intraclass correlation between ratings averaged (ICC 2) is 0.81 and 0.86, thus, the coefficients are also acceptable. The obtained F statistics are significant ($P < 0.05$), indicating that the interclass correlation coefficients significantly differ from zero for each of the latent variables used in the model.

Factor analysis

Factor analysis is an essential statistical technique used to verify factor structures within a set of latent variables (Jöreskog, 1969). Research recommends performing factor analyses when the model includes latent variables validated and tested by previous studies. This analysis allows to assess whether or not data, which will be used to test hypothesized associations, actually fits the assumed structure of the measures. If factor analysis does not confirm that the data supports expected factor loading patterns, it implies that data used in a study may not represent the variables as expected (Byrne, 2009; Baron & Kenny, 1986; Long, 1983; Jöreskog, 1969).

Factor analysis and the overall model fit of the data were performed by using STATA 12, and SPSS with AMOS (Analysis of Model Structure 20). The uni-dimensionality of absorptive capacity and culture of innovation was assumed, because in the dissertation, absorptive capacity and culture of innovation are conceptualized as two single factors. Principal factor loading for each construct was performed. This form of loading should, according to research, reveal the fit while reducing the inflation of estimates of variance accounted for (Costello & Osbourne, 2005). Furthermore, orthogonal varimax rotation (varimax horst blanks .3) was performed to identify individual items that did not sufficiently load on the extracted factor. Factor loadings using the varimax orthogonal rotation shows how the items are weighted for each factor. As a common extraction method, orthogonal rotations produce factors that are uncorrected, thus it may result in losing of information pertaining to common variance among factors which are correlated. If the factors are however uncorrelated, orthogonal and oblique rotation produce nearly identical results (Costello & Osbourne, 2005). Each of the latent constructs used in the study (absorptive capacity and culture of innovation) is conceptualized as one factor, thus the orthogonal rotation is appropriate.

TABLE 14

Absorptive capacity—factor loading of individual items

Item	Factor	Uniqueness
Absorptive Capacity 1	0.6500	0.5775
Absorptive Capacity 2	0.5435	0.7046
Absorptive Capacity 3	0.5704	0.6747
Absorptive Capacity 4	0.5630	0.6830
Absorptive Capacity 5	0.3919	0.8464
Absorptive Capacity 6	0.4701	0.7790
Absorptive Capacity 7	0.4827	0.7450
Absorptive Capacity 8	0.2204	0.9514
Absorptive Capacity 9	0.5065	0.7435
Absorptive Capacity 10	0.4868	0.7621
Absorptive Capacity 11	0.5684	0.6769
Absorptive Capacity 12	0.4844	0.7644
Absorptive Capacity 13	0.5958	0.6451
Absorptive Capacity 14	0.5718	0.6730
Absorptive Capacity 15	0.3436	0.8817
Absorptive Capacity 16	0.4789	0.7707
Absorptive Capacity 17	0.4588	0.7895
Absorptive Capacity 18	0.5591	0.6874
Absorptive Capacity 19	0.3857	0.8462
Absorptive Capacity 20	0.4987	0.7512
Absorptive Capacity 21	0.5320	0.7169
Absorptive Capacity 22	0.4904	0.7476
Absorptive Capacity 23	0.5551	0.6969

TABLE 15

Culture of innovation—factor loading of individual items

Item	Factor	Uniqueness
Culture of Innovation 1	0.5345	0.7143
Culture of Innovation 2	0.5708	0.6742
Culture of Innovation 3	0.6065	0.6321
Culture of Innovation 4	0.5185	0.7311
Culture of Innovation 5	0.5564	0.6904
Culture of Innovation 6	0.6039	0.6353
Culture of Innovation 7	0.5122	0.7376
Culture of Innovation 8	0.4709	0.7702
Culture of Innovation 9	0.6401	0.5903
Culture of Innovation 10	0.4894	0.7702
Culture of Innovation 11	0.5684	0.6841
Culture of Innovation 12	0.4523	0.7954
Culture of Innovation 13	0.6286	0.6049
Culture of Innovation 14	0.4935	0.7564
Culture of Innovation 15	0.5904	0.6514

Factor loadings revealed by the data indicates that one of the items (“Absorptive Capacity 8”) was not sufficiently loading on the extracted factor. Subsequently, the item was not used in the subsequent analysis. The removal of the item improved the overall model-data fit.

The Kaiser-Meyer-Olkin (KMO) and the Bartlett’s test

The Kaiser-Meyer-Olkin (KMO) and the Bartlett’s test determine whether or not items comprising one factor load significantly on this factor. The tests can therefore demonstrate if the items comprising a measure represent a latent construct as theorized by research (Hair, Anderson, Tatham & Black, 1998).

According to research, The Kaiser-Meyer-Olkin (KMO) measures the magnitudes of the observed correlation coefficients in relation to the magnitudes of the expected correlation coefficients (Hair, Anderson, Tatham & Black, 1998). The KMO coefficient ranges from 0 to 1.

The larger KMO values are desirable because they indicate stronger correlations between pairs of items (i.e., potential factors) explaining the other items. A value of 0 indicates that the items comprising a construct do not share any common factor, while a value of 1 indicates the strongest possible correlation among the items measuring the same factor. According to studies, if the value of the KMO statistic is below 0.5, such results show weak, unacceptable loading. The loading above 0.8 are deemed as very strong.

TABLE 16

Absorptive capacity—The KMO and the Bartlett’s tests

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.895
Bartlett’s test of sphericity	Chi-Square	1813.45
	df	375
	sig	.000

TABLE 17

Culture of innovation—The KMO and the Bartlett’s tests

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.903
Bartlett’s test of sphericity	Chi-Square	1106.073
	df	304
	sig	.000

The obtained KMO coefficients for the latent constructs are: 0.895 (absorptive capacity) and 0.905 (culture of innovation) should be viewed as strong, thus demonstrating sufficient factor loadings.

The Bartlett’s test of sphericity is used to test the hypothesis that the correlation matrix is an identity matrix. The null hypothesis assumes no correlations among items comprising a factor. If the hypothesis is rejected, a statistically significant correlation among the items within a latent

construct exists. In other words, when the null hypothesis is rejected, a desired correlation matrix composed of the items correlated with themselves is extracted (Hair, Anderson, Tatham & Black, 1998). Results reveal strong factor loadings ($P < 0.0001$) in a case of both latent constructs used in the model.

Discriminant validation of constructs

Campbell and Fiske (1959) explain the importance of discriminant validity. The authors suggest that discriminant analysis can be used to ensure the distinctiveness among all latent constructs used in the study. The aim of the analysis is therefore to show that a measure of one construct is not highly correlated to another measure of a theoretically distinct concept (Campbell & Fiske, 1959).

Research demonstrates that when the differences among independent variables are not clearly established, they may result in biased coefficients. Discriminant factor analysis is therefore recommended to confirm that factor loading patterns are distinct (Belsley, Kuh, & Welsch, 1980). Research suggests that only items that load on a factor at the level of 0.3, or higher, should be retained in the model (Zimbardo & Boyd, 1999). When individual items representing one construct load highly on factors representing different constructs, such loadings can imply that the interdependence among independent variables will result in biased coefficients (Campbell & Fiske, 1959).

According to research, sufficient discriminant validity can be established when a latent construct shares more variance with its own measures than with the items of other constructs included in the model (Fornell & Larcker, 1981). Consequently, the discriminant factor analysis

was conducted to demonstrate the distinctiveness between absorptive capacity and culture of innovation

TABLE 18

Discriminant validation: Culture of innovation and absorptive capacity

Item	Factor 1	Factor 2	Uniqueness
Innovation 1		0.5203	0.6960
Innovation 2		0.5520	0.6672
Innovation 3		0.5853	0.6546
Innovation 4		0.5028	0.7460
Innovation 5		0.5505	0.6970
Innovation 6		0.5948	0.6453
Innovation 7		0.5051	0.6948
Innovation 8		0.4654	0.7820
Innovation 9		0.6554	0.5692
Innovation 11		0.4812	0.7631
Innovation 12		0.5719	0.6719
Innovation 13		0.5618	0.6858
Innovation 14		0.6291	0.6031
Innovation 15		0.5773	0.6647
Absorptive Capacity 1	0.6330		0.5394
Absorptive Capacity 2	0.5618		0.6741
Absorptive Capacity 3	0.5382		0.7017
Absorptive Capacity 4	0.5429		0.6614
Absorptive Capacity 5	0.4166		0.8254
Absorptive Capacity 6	0.4465		0.7979
Absorptive Capacity 7	0.3827		0.8450
Absorptive Capacity 9	0.4877		0.7389
Absorptive Capacity 10	0.4498		0.7441
Absorptive Capacity 11	0.5479		0.6871
Absorptive Capacity 12	0.5178		0.6751
Absorptive Capacity 13	0.5577		0.6500
Absorptive Capacity 14	0.5535		0.6895
Absorptive Capacity 15	0.4811		0.7546
Absorptive Capacity 16	0.4618		0.7857
Absorptive Capacity 17	0.5112		0.7363
Absorptive Capacity 18	0.5583		0.6835
Absorptive Capacity 19	0.4438		0.7986
Absorptive Capacity 20	0.4476		0.7975
Absorptive Capacity 21	0.5822		0.6601
Absorptive Capacity 22	0.4564		0.7842
Absorptive Capacity 23	0.5493		0.6969

Revealed loading patterns disclose the two distinct factors extracted from the data. This confirms therefore that the measures used in the study represent two distinct constructs.

Factor rotated matrix

A factor rotated matrix is another important technique used to determine discriminant validity of constructs. A factor loading matrix reveals relationships among distinct factors extracted from data. The matrix divides data into subgroups by assigning negative values to one subgroup and positive values to the other subgroup, consequently, it allows to clearly separate item loading patterns into distinct factors.

TABLE 19

Discriminant analysis: Factor rotation matrix

	Factor 1	Factor 2
Factor 1	0.7983	0.6023
Factor 2	-0.6023	0.7983

When both latent constructs, absorptive capacity and culture of innovation, were jointly entered into STATA 12, the matrix revealed that two distinct factors were extracted: one associated with absorptive capacity (0.7983), the other with culture of innovation (-0.6023). The matrix performs therefore an important discriminant function, confirming the distinctiveness of two factors extracted from the data.

Eigenvalues

The eigenvalue is defined as a ratio of the between-groups sum of squares to the within-groups or error sum of squares. The strength of the eigenvalue allows the determination of the spread of the group loadings in the corresponding dimension of the discriminant space. Larger eigenvalues (above 1.0) indicate that the discriminant function is effective, thus, it will distinguish between the distinct groupings identified within the data.

During the factor extracting process, the first extracted factor accounts for the most variance, the second accounts for the next highest amount of variance. Research recommends that factors with the eigenvalue exceeding 1.0 should be retained in the model (Ford, MacCallum & Tait, 1986; Weiss, 1976).

TABLE 20

Discriminant analysis: Eigenvalues

	Eigenvalues	Difference	Proportion	Cumulative
Factor 1	6.67258	2.91936	0.6400	0.6400
Factor 2	3.75322	2.77476	0.3600	1.0000

The obtained eigenvalues for the factors extracted from the data reveal strong loading patterns on the two distinct factors. The strength of both eigenvalues (6.67258 for factor 1 and 3.75322 for factor 2) demonstrates the distinctiveness of the measures. Furthermore, eigenvalues can detect multicollinearity. According to Montgomery (2001), when the obtained eigenvalues are small (close to zero), they can indicate the problem of multicollinearity. The obtained

eigenvalues strongly indicate that multicollinearity of absorptive capacity and culture of innovation is not present.

In sum, the results of the tests confirm that the items comprising culture of innovation and the items comprising absorptive capacity have more common covariance with themselves than with the items representing the other construct. Consequently, they should be viewed as two separate constructs.

Model-data fit

The existing literature recommends various tests aiming to assess the strength of fit indices, thus determining the data-model fit. The literature distinguishes three categories of tests, these are: absolute, relative and non-centrality fit indices (Kaniskan & McCoach, 2011; Barrett, 2007; Raykov, 2000; Joreskog & Sorbom, 1993).

Absolute fit indices determine the fit between obtained and implied covariance matrices. The most popular tests in this category are: chi-square (χ^2), and the goodness of fit (GFI) index. Research points out however that absolute fit indices are highly sensitive to the sample size. Consequently, larger samples tend to produce larger, usually significant, chi-square statistic, signaling poor fit. Conversely, small samples accept a poor model-data fit altogether. Therefore, according to research, absolute fit indices rarely reveal a desired, non-significant chi-square statistic, when a sample size exceeds 200 observations. Statistically significant statistics signaling poor fit are therefore obtained even when other fit indices suggest acceptable fit of the model (Tanaka, 1993).

Another category of tests measuring data-model fit are relative fit indices. The literature distinguishes among them, such indices as the Bentler-Bonett Non-normed Fit Index (BBNFI)

and the Normed Fit Index (NFI). Relative indices compare a chi-square statistic obtained from comparing a tested model to a null model—a model that assumes that all variables used in the model are uncorrelated. Because the null model is used as a baseline assuming a lack of correlation among variables, it will always reveal very large and statistically significant chi-square, which implies very poor fit of the data. The objective of the test is therefore to demonstrate that the “real” model significantly differs from the null-model, consequently, high rejection is expected. Obtained test statistics can range from 0 to 1. Research suggests that a cutoff value around 0.9 should reveal good fit (Hu & Bentler, 1999; Hair, 1998).

The third major group of tests measuring the level of data-model fit includes non-centrality-based indices, such as Root Mean Square Error of Approximation (RMSEA), or Bentler’s Comparative Fit Index (CFI). This approach uses a chi-square equal to the level of degree of freedom for the model as having a perfect fit (as opposed to chi-square equal to 0). Thus, the non-centrality parameter is calculated by subtracting degrees of freedoms of the model from the chi-square ($\chi^2 - df$). Then, the value is adjusted for sample size and referred to as the rescaled non-centrality. Hu and Bentler (1999), who study empirical applications of various fit indices, suggest that RMSEA should remain below .06 to reveal good fit of the model. It should be however noted, that similarly to other tests examining the data model fit, also the non-centrality based tests have been criticized as biased (Raykov, 2005).

In this dissertation, SPSS AMOS 20 was used to calculate fit indices. As a result, the indices from all three groups (absolute, relative and non-centrality based) were obtained.

TABLE 21

The model-data fit

	Chi-Square	RMSEA	CFI	NFI	GFI
Culture of innovation	189.3	0.05	0.934	0.92	0.90
Absorptive capacity	395.3	0.05	0.878	0.91	0.89
Overall model	546.2	0.06	0.872	0.91	0.89

The fit indices reveal an acceptable level of fit for the data used in this study. Chi-square statistics are high (189.3; 395.3; 546.2), thus these indices reveal rather poor fit. The other tests however reveal an acceptable level of fit indices. Thus, results reveal an acceptable relative fit measure with a normed fit index (NFI) of .91, where a maximum score of 1 indicate a strongest fit. Root mean square error approximation (RMSEA) of 0.06 also indicates a satisfactory level of fit, as it falls within the range between .05 and .08 recommended by research (Hair, 1998). In general, the various indices of overall goodness of fit indicate that the model should be viewed as acceptable.

APPENDIX B

MEASURES

NETWORK DIVERSITY

Adapted from Goerzen & Beamish (2005) and Powell, Koput & Smith-Doerr (1996).

Please list your department's business-related contacts including other departments in your hospital, other healthcare organizations and other businesses (local, nationwide, across-industries).

1. Please list the number of all professional contacts between your Emergency Department and other departments/units in your hospital.
2. Please list the number of all professional contacts between your Emergency Department and other businesses (including hospitals, firms in the medical field, and firms in other industries) in your city.
3. Please list the number of professional contacts between your Emergency Department and other businesses (including hospitals, firms in medical field, and firms in other industries) in your state.
4. Please list the number of professional contacts between your Emergency Department and other businesses (including hospitals, firms in the medical field, and firms in other industries) out of your state.

ABSORPTIVE CAPACITY

Adapted from Jansen, Van Den Bosch & Volberda (2005)

(1-strongly disagree to 5-strongly agree)

My emergency department has frequent interactions with administration of the hospital to acquire new knowledge.

Nurses from my department regularly visit other departments.

Doctors from my department regularly visit other departments.

We collect healthcare industry information through informal means (e.g. lunch with industry friends, talks with trade partners).

Other departments of our hospital are hardly visited (reversed)

My emergency department periodically organizes special meetings with vendors/partners or third parties to acquire new knowledge.

Our employees regularly approach third parties such as technology vendors, pharmaceutical reps, or consultants.

We are slow to recognize shifts in our healthcare industry (e.g. competition, regulation, demography) (reversed)

New opportunities to serve our patients are quickly understood.

We quickly analyze and interpret healthcare industry demands.

We record and store newly acquired knowledge for future reference.

Our department uses fully functioning healthcare technology systems

Our emergency department regularly considers the consequences of changing healthcare industry demands in terms of new practices and services.

Our emergency department quickly analyzes the usefulness of new external information to existing knowledge.

Employees hardly share practical experiences (reversed).

Our department periodically meets to discuss consequences of healthcare industry trends and new patient care delivery developments.

It is clearly known how activities within our department are organized and should be performed.

We laboriously grasp the opportunities for our department from new external knowledge.

Patient complaints fall on deaf ears in our department (reversed).

Our emergency department has a clear division of roles and responsibilities.

We constantly consider how to better exploit knowledge.

Our department has difficulty implementing new methods of providing care.

Our employees have knowledge regarding our services.

CULTURE OF INNOVATION

Adapted from Anderson & West (1998) and Scott & Bruce (1994)

(1 strongly disagree to 5 strongly agree)

My emergency department generates creative ideas.

My department is innovative.

My emergency department searches for new service technology, processes or service ideas.

Employees in my department are always searching for fresh, new ways of solving problems.

My department is always moving forward the development of new answers to existing problems.

My department promotes and champions new ideas to others.

My department investigates and secures resources needed to implement new ideas.

My emergency department develops future plans for the development of new ideas.

My department is always moving forward the development of new answers.

In my department, assistance in developing new ideas is readily available.

My emergency department is open and responsive to change.

In my department we take time to think about new ideas.

Nurses in my department collaborate in order to help develop new ideas.

Doctors in my department collaborate in order to help develop new ideas.

Employees in my department share resources to help in the application of new ideas.

Our employees provide practical support for new ideas and their application.

PERFORMANCE

- (1) Average (median) time patients spent in the emergency department, before they were admitted to the hospital as an inpatient (reported in minutes).
- (2) Average (median) time patients spent in the emergency department, after the doctor decided to admit them as an inpatient before leaving the emergency department for their inpatient room (reported in minutes).
- (3) Average (median) time patients spent in the emergency department before being sent home (reported in minutes).
- (4) Average time (median) patients spent in the emergency department before they were seen by a healthcare professional (reported in minutes).
- (5) Percentage of patients who left the emergency department before being seen by a doctor.