Management by Originals: The Influence of Inventor CEOs on Firms' Strategic Decisions

by

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ABSTRACT

This dissertation examines the influence of inventor chief executive officers (CEOs) on major strategic outcomes, including strategic change, strategic distinctiveness, and stakeholder management. Inventor CEOs are those who hold at least one patent. Approximately 20 percent of firms in the innovation-intensive industries are managed by inventor CEOs. Famous CEOs like Jeff Bezos, Bill Gates, Steve Jobs, Sanjay Mehrotra, and Mark Zuckerberg are all examples of inventor CEOs. Despite the large presence of inventor CEOs in the business world, the management literature has not examined how they can affect firms' strategic choices. Building on studies about inventors and strategic leadership, I identify a CEO's background of being an inventor as an important type of experience that can influence major strategic outcomes. My theory explains why inventor CEOs have the unique attributes of divergent thinking and intrinsic motivation. These unique attributes of inventor CEOs lead them to pursue strategies that are deviant from the past, different from other firms, and responsive to diverse demands of multiple stakeholders. I build on theories about CEO power, firms' slack resources, and industry dynamism to explain how they moderate the effect of inventor CEOs. Using a longitudinal database of S&P 1500 firms and their CEOs' inventor background, I empirically test my theoretical predictions. I find that firms managed by inventor CEOs pursue more strategic change compared to other firms. The results of the analysis also show that CEO power and firm slack resources strengthen the influence of inventor CEOs on strategic change.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

A large number of studies in the management literature have examined the important impacts of chief executive officers (CEOs) on major organizational outcomes (e.g., Mackey, 2008; Quigley & Hambrick, 2015). These studies suggest profound influences of CEOs on their organizations and further show that their impact has been increasing in the past years. Building on the upper echelons theory (Hambrick & Mason, 1984), scholars have studied a wide range of characteristics of CEOs that affect organizational outcomes (Finkelstein, Hambrick, & Cannella, 2009). Studies show that organizations are influenced by a diverse set of CEO characteristics (e.g., Bernile, Bhagwat, & Rau, 2017; Chatterjee & Hambrick, 2007; Chin, Hambrick, & Treviño, 2013; Kish-Gephart & Campbell, 2015; Wang & Yin, 2018).

Extant studies have greatly enhanced our understanding about CEOs' influences on organizations, but effects of CEOs' professional backgrounds have received relatively little attention. Professional backgrounds of CEOs are their work-related experiences throughout their career paths (Dittmar & Duchin, 2016). Professional backgrounds of CEOs reflect the underlying psychological attributes, knowledge, and skills of CEOs, which have a great impact on the strategic decisions that CEOs make (Barker & Mueller, 2002; Crossland, Zyung, Hiller, & Hambrick, 2014; Dittmar & Duchin, 2016; Hambrick & Mason, 1984). Because CEOs' perceptions and interpretations of information are affected by their previous career experiences, it is important to identify CEOs' professional backgrounds in order to understand their strategic decisions.

One important and pronounced type of professional backgrounds among CEOs that has been largely neglected in the management literature is a background as an inventor. An inventor CEO is a CEO who has at least one patent registered under his or her name (Grant 2016; Islam & Zein, 2020; Mieg, 2011). Approximately 20 percent of high-technology firms are run by inventor CEOs, and the total market value of firms run by inventor CEOs is more than 25 percent of the market capitalization of New York Stock Exchange (Bostan & Mian, 2019; Islam & Zein, 2020). Many CEOs of major companies in the business world are inventor CEOs. Well known CEOs like Mark Zuckerberg of Facebook, Steve Jobs of Apple, Steve Ballmer and Bill Gates of Microsoft, Larry Page of Google, Larry Ellison of Oracle, Reed Hastings of Netflix, Sanjay Mehrotra of Micron, and Jeff Bezos of Amazon are all inventor CEOs. Inventions are the building blocks for innovation, which is important for firms to achieve growth and competitive advantages (Grant, 2016; Lavie, Stettner, & Tushman, 2010; Schumpeter, 1942), and inventors who generate patents are important resources to firms (Agarwal, Ganco, & Ziedonis, 2009; Rahko, 2017; Rosenkopf & Almeida, 2003; Toivanen & Väänänen, 2012). Inventors tend to be divergent thinkers and intrinsically motivated individuals, compared to non-inventors (Forsgren, 1990; Frosch et al., 2015; Giuri et al., 2007 Mieg, 2011; Rossman, 1931; Zwick, Frosch, Hoisl, & Harhoff, 2017). An inventor CEO possesses the attributes of an inventor, and has a significant influence on the firm as a CEO.

Despite the prevalence of inventor CEOs in the business world, no studies in the management field have examined how they can impact firms' strategic decisions. In this study, I examine how inventor CEOs influence a range of strategic outcomes. A strategic

decision of a CEO determines the performance of the firm and is an important topic in the management field that deserves much attention. Building on studies on inventors and upper echelons theory, I explain why CEOs with an inventor background engage in a higher level of strategic change, strategic distinctiveness, and stakeholder management. My theory explains why inventor CEOs possess the unique attributes of divergent thinking and intrinsic motivation, and how these attributes explain inventor CEOs' tendency to pursue strategies that are different from the past and different from other firms, and more effectively manage diverse demands from multiple stakeholders. I also examine how CEO power, firms' slack resources, and industry dynamism strengthen the influence of inventor CEOs on these strategic decisions above. Using a longitudinal database of S&P 1500 firms and their CEOs' inventor background, I empirically test my theoretical predictions and find support for the influence of inventor CEOs on firms' strategic change. I also find that CEO power and firms' slack resources strengthen the positive influence of inventor CEOs on firms' strategic change. However, I do not find support for the influence of inventor CEOs on firms' strategic distinctiveness and stakeholder management.

This study makes important contributions to the strategic leadership literature. I identify an inventor CEO as an important but understudied type of CEOs' professional background that can explain a wide range of organizational outcomes. CEOs obtain diverse professional experiences along their career paths, and these professional backgrounds of CEOs affect their perceptions and interpretations of information (Barker & Mueller, 2002; Crossland et al., 2014; Dittmar & Duchin, 2016; Hambrick & Mason, 1984). CEOs' work experiences throughout their careers can have a strong impact on

their decisions, influencing firms' strategies and performance outcomes. Although there are wide varieties of professional backgrounds of CEOs, extant studies have mostly focused on a few types of CEOs' professional backgrounds such as international experiences and functional backgrounds, without considering the inventor background of CEOs (Benmelech & Frydman, 2015; Carpenter, Sanders, & Gregersen, 2001; Crossland, et al, 2014; Li & Patel, 2019; Wang, Holmes, Oh, & Zhu, 2016). Despite evidence that many firms are run by inventor CEOs and that these CEOs have significant impacts on firms, the influence of inventor CEOs on firms' strategic decisions has not been studied yet. Studies on inventors strongly suggest that they have unique attributes of divergent thinking and intrinsic motivation, which can affect their decisions (Forsgren, 1990; Frosch et al., 2015; Giuri et al., 2007 Mieg, 2011; Rossman, 1931; Zwick, Frosch, Hoisl, & Harhoff, 2017). By explaining how inventor CEOs with these unique attributes affect firms' strategic decisions, this study suggests future opportunities to examine the influence of an important type of CEOs' professional background on diverse strategies and performance outcomes of firms.

This study also contributes to strategic management research by explaining how CEOs' inventor background is an important and novel determinant of an important strategic decision. This study aims to contribute to the strategic change research by identifying an important determinant of it. Strategic change is a widely studied strategic decisions that can greatly influence organizational performance (Ginsberg, 1988; Rajagopalan & Spreitzer, 1997). Many studies have identified diverse determinants of strategic change, but no studies have examined the effects of CEOs' inventor background in analyzing this important strategic decision. By conducting a systematic study to show

inventor background of a CEO as an important determinant of strategic change, this study highlights how a unique and prevalent type of professional background influences a CEO's major strategic decision.

CHAPTER 2

LITERATURE REVIEW

The Influence of CEOs' Backgrounds on Firms

Since Hambrick and Mason (1984) introduced the upper echelons theory into the management literature, many scholars have studied CEOs and their effects on firm's strategic decisions and performance outcomes. The theory suggests that the decisions of CEOs greatly affect organizational outcomes. CEOs make decisions based on their own interpretations of the situation, which are influenced by their experiences, values, and personalities (Hambrick, 2007; Hambrick & Mason, 1984). Results of studies about the influence of CEOs show that CEOs have a significant impact on their firms' strategies (Mackey, 2008; Quigley & Hambrick, 2015). Building on the upper echelons theory, studies have examined the organization as a reflection of its top managers.

CEOs' backgrounds are one of the most important topics in the upper echelons literature, and have been frequently studied across disciplines. Backgrounds of CEOs reflect their cognition, knowledge, skills, abilities, and motivation, which affect firms' strategic decisions (Barker & Mueller, 2002; Dittmar & Duchin, 2016; Hambrick & Mason, 1984). Exposures to experiences from their backgrounds affect CEOs to focus more on information that are related to their backgrounds (Dearborn & Simon, 1958; Ocasio, 1997). Previous studies have examined diverse types of CEOs' backgrounds and experiences, including education backgrounds, tenure, military backgrounds, functional backgrounds, international experiences, and early life experiences. In this section, I

briefly review studies about the influence of backgrounds of CEOs on their strategic decisions.

Previous studies have examined diverse non-professional backgrounds of CEOs. Extant studies suggest that even experiences from earlier years of CEOs' life can affect their strategic decisions. CEOs' social class backgrounds and exposures to natural disasters and economic depressions have been examined as early life experiences that affect CEOs' decisions (Bernile et al., 2017; Kish-Gephart & Campbell, 2015; Malmendier, Tate, & Yan, 2011). Education background is one of the non-professional backgrounds that have been widely studied to understand CEOs' decision making. Education level, MBA degree, law degree, graduating from elite schools, and location of education have been examined in the literature as educational backgrounds that can affect CEOs (Gottesman & Morey, 2010; Lin, Lin, Song, & Li, 2011; Pham, 2020; Wang & Yin, 2018).

Among the types of experiences and backgrounds of CEOs, professional backgrounds have received attention from scholars. A professional background is an important characteristic of CEOs that can have a profound impact on their strategic decisions. Studies show that CEOs' professional backgrounds reflect their underlying psychological attributes, which have a great influence on their decisions (Barker & Mueller, 2002; Benmelech & Frydman, 2015; Dittmar & Duchin, 2016). Upper echelons theory suggests that CEOs' perceptions and interpretations of information and subsequent decisions are affected by their previous career backgrounds (Hambrick & Mason, 1984). Professional backgrounds and experiences work as a lens, through which CEOs see the world. CEOs' professional backgrounds are more directly related to their job relevant

decisions compared to other non-job relevant characteristics, and it is important to identify CEOs' professional backgrounds in order to understand their strategic decisions.

However, most of the studies are focused on a few types of professional backgrounds, without considering other diverse professional experiences of CEOs (Wang et al., 2016). CEO tenure length and functional backgrounds are types of CEO professional experiences that have received most attention. CEO tenure and functional backgrounds have been shown to be related to attitudes toward change and foreign market entry modes (Herrman & Datta, 2002; Herrmann & Datta, 2006; Musteen, Barker, & Baeten, 2006). CEOs with long tenure are less likely to be fond of making changes because they are more rigid and try to keep existing paradigms (Musteen et al., 2006). In terms of foreign market entry modes, CEOs with longer tenures are able to acquire more power and legitimacy, which allow them to choose full-control entry modes that require more control and resources (Herrman & Datta, 2002). CEO work experience also has an influence on foreign direct investment entry modes. CEOs with less firm experience engage in more acquisitions and greenfield investments, compared to joint ventures (Herrmann & Datta, 2006). Functional background is another work experience of CEOs that has been studied in the literature. CEOs with a throughput functional background put more emphasis on control and efficiency, and have more conservative attitudes toward change (Musteen et al., 2006). CEOs with throughput backgrounds that are more focused on control are also more likely to choose full-control entry modes when entering foreign markets (Herrman & Datta, 2002). In terms of foreign direct investment entry modes, CEOs with throughput backgrounds prefer acquisitions over greenfield investments and joint ventures (Herrman & Datta, 2006).

Crossland and colleagues (2014) introduced CEO career variety as another type of CEO work experience that has an impact on firms' strategic decisions. CEOs with more career variety are motivated to pursue novelty and change, and cognitively ready to embrace different perspectives and ideas. CEOs who have diverse experiences in different professional and institutional areas show higher levels of strategic change, strategic distinctiveness, and top management team (TMT) turnover. In a similar vein, Li and Patel (2019) studied the influence of CEOs with experiences across industries or firms on firm performance and found a negative association. These generalist CEOs may be able to pursue novel and different strategies, but they are not the best integrators and may not be capable of organizing and utilizing resources for the focal industry and the firm. CEOs' industry experiences can also help the firm when engaging in acquisitions (Custódio & Metzger, 2013). CEOs with experiences in the target firm's industry have relevant knowledge and are able to negotiate a better deal in acquisitions.

CEOs with specific types of professional backgrounds also have a unique strategic style (Barker & Mueller, 2002; Custódio & Metzger, 2014). Financial expert CEOs hold more debt but less cash, engage in more share repurchases, and choose financially sophisticated strategies. CEOs with marketing and engineering/research and development (R&D) career experiences are more likely to invest in R&D. CEOs with a business management experience have more relevant skills in making decisions, and are more likely to take risks, resulting in more innovation activities (Lin et al., 2011). Interestingly, Hamori and Koyuncu (2015) found that CEOs with previous experiences as a CEO can have a negative influence on firm performance. Furthermore, Schoar and Zuo (2017) found that CEOs who started their careers during economic recessions made more

conservative decisions. These CEOs prefer lower levels of capital expenditures, R&D investments, leverages, working capital needs, and costs. In a similar vein, Dittmar and Duchin (2016) found that CEOs who have past work experiences in a troubled firm hold more cash, less debt, and reduce capital expenditures. Another interesting type of CEOs are military CEOs (Benmelech & Frydman, 2015; Law & Mills, 2017). Military service requires dedication, strong sense of duty, and leadership. Accordingly, CEOs with military backgrounds make more conservative investments and less unethical choices. They are also better able to withstand industry downturns, performing better than their peers during hard times. However, Malmendier and colleagues (2011) found that military experience of CEOs can lead to more aggressive firm strategies, which is contradictory to results of other studies suggesting that military CEOs make conservative decisions.

CEO international experience is a specific type of professional experience that has been widely studied. Research shows that a CEO's international experience is associated with better firm performance (Carpenter et al., 2001; Daily, Certo, & Dalton, 2000; Le & Kroll, 2017). Furthermore, international experiences can affect firm outcomes other than financial performance. For example, Slater and Dixon-Fowler (2009) found a positive relationship between a CEO's international experience and corporate social responsibility (CSR). International assignment experiences increase awareness about stakeholders' diverse demands, ability to process complex information, open mindedness, and interest in responsibility and respect for other people, resulting in better corporate social performance (CSP). CEOs' international experiences also have an influence on other strategies. Le and Kroll (2017) found that CEOs' international experience is positively related to strategic change. Learning from international experiences also results in a

positive relationship between CEOs' international experiences and full-control entry modes into foreign markets (Herrmann & Datta, 2002). CEOs with international experiences prefer acquisitions and greenfield investments over joint ventures when making decisions about foreign direct investment entry modes (Herrmann & Datta, 2006).

Although extant studies have greatly enhanced our understanding about the influence of CEOs' professional backgrounds on organizational outcomes, the impact of inventor CEOs has been largely neglected in the management field. Many CEOs of large companies in the business world are inventor CEOs, and about 20 percent of CEOs in the high-technology industries hold at least one patent (Islam & Zein, 2020). A CEO who is also an inventor is a valuable human resource to the organization, and CEOs with a background as an inventor possess unique attributes that affect their decisions. Considering their number and influence in the business world, inventor CEOs deserve attention as CEOs with a unique professional background. Building on research on inventors, I explain the importance of inventors and inventor CEOs, and their attributes in the following sections.

Inventors and Inventor CEOs

Inventors. According to Grant (2016), "Invention is the creation of new products and processes through the development of new knowledge or from new combinations of existing knowledge" (p. 243). Inventions are often measured by using patents, which grants "Exclusive rights to a new and useful product, process, substance, or design" (Grant, 2016: p. 246). It is debatable whether patents have a direct positive influence on

firm performance or not (Artz, Norman, Hatfield, & Cardinal, 2010; Bogner & Bansal, 2007; Ernst, 2001; Mann & Sager, 2007), but patents can positively influence firm performance at least through indirect routes, such as product developments and introduction into the market. Inventions are the roots of innovation, which is important for securing economic growth and competitive advantages (Grant, 2016; Lavie et al., 2010; Schumpeter, 1942).

An inventor is a person who holds at least one patent (Mieg, 2011). Inventors are important resources to organizations because they carry valuable knowledge, skills, and abilities, and determine the innovative outcomes of the firms they work for (Gay, Latham, & Le Bas, 2008; Kaiser, Kongsted, & Rønde, 2015; Rosenkopf & Almeida, 2003; Rahko, 2017). Firms understand the value of inventors and try their best to retain inventors within the firm, or minimize costs that occur when they leave the firm (Agarwal et al., 2009; Toivanen & Väänänen, 2012). Inventors possess specific cognitive and motivational attributes that distinguish them from others. Compared to non-inventors, inventors in general have high levels of divergent thinking abilities and are intrinsically motivated by novel, creative, and challenging tasks.

First, inventors tend to be divergent thinkers (Frosch et al., 2015; Martinsen & Diseth, 2011; Mieg, 2011; Wolf & Mieg, 2010; Zwick et al., 2017). Many studies show theoretical and empirical support for similar attributes of inventors that can be summarized as divergent thinking. Building on previous studies, Mieg (2011) theoretically suggests that inventors tend to be divergent thinkers. Inventors consider different alternatives and pursue new paths to solve problems. Research by Rossman

(1931), which is based on information from inventors, patent attorneys, and directors of R&D departments, suggests that inventors are different from other individuals because they are more original, non-conforming, and imaginative, which support the divergent thinking abilities of inventors. Utilizing the Norwegian registry of patent holders, Martinsen and Diseth (2011) found that inventors have more characteristics related to divergent thinking, compared to non-inventors. Their study results suggest that inventors tend to have cognitive styles that are related to dissociating from previously set principles and developing new ideas. Based on a sample of German inventors with patent applications in years between 1978 and 2010, Frosch and colleagues (2015) found that inventors who have high levels of inventive productivity are divergent thinkers. Zwick and colleagues (2017) also found that divergent thinking is key to a higher individual-level inventive performance. A study by Fromer (2010) about the psychology of patent law suggests that novelty and non-obviousness are required to be protected as a patent, suggesting that divergent thinking is essential to generate patents. Furthermore, studies on creativity, which is closely related to inventions, provide additional support for the notion that inventors are characterized by their divergent thinking. Divergent thinking is strongly related to an individual's creative and innovative potential (Amabile, 1988; Anderson, Potočnik, & Zhou, 2014; Barron & Harrington, 1981; Garfield, Taylor, Dennis, & Satzinger, 2001; Runco & Acar, 2012).

Divergent thinking has long been studied as a major indicator of creative potential (Gibson, Folley, & Park, 2009; Runco, 2010; Runco, 2014; Runco & Acar, 2012; Wang, Wijnants, & Ritter, 2018). It is often measured in terms of the number of ideas (fluency), the number of uncommon ideas (originality), and the number of categories of ideas

(flexibility), and has been widely used to capture creative thinking (Gibson et al., 2009; Runco, 2014). Individuals who are cognitively divergent have abilities to generate original and novel ideas and provide multiple alternatives and answers (Brophy, 2001; Guilford, 1967; McCrae, 1987; Runco & Acar, 2012; Wolf & Mieg, 2010). Individuals with a high level of divergent thinking make multiple decisions that deviate from common and previously used choices, unlike convergent thinkers who focus on finding the one right answer for the goal (Guilford, 1967; Runco, 2014).

Important aspects of divergent thinking are associative and dissociative abilities (Runco, 2010; Wang et al., 2018). Individuals with a high level of associative ability can easily retrieve, link, and combine concepts that can be seen as remote and unrelated (Benedek, Könen, & Neubauer, 2012; Runco, 2010; Wang et al., 2018). Individuals who can generate new concepts that are unrelated to existing concepts and form associations between remote concepts have a higher level of divergent thinking, which shows a creative potential. Dissociative ability refers to the ability to fluently generate and switch between concepts that are unrelated to the previous and salient concept (Benedek et al., 2012; Mednick, 1962). Individuals with a high level of dissociative abilities can easily detach from the existing concepts and consider other alternatives that can be a better option for the current situation, showing high levels of divergent thinking (Benedek et al., 2012; Mednick, 1962).

To summarize, studies about inventors and divergent thinking suggest that inventors tend to have a higher level of divergent thinking capabilities compared to others (Frosch et al., 2015; Martinsen & Diseth, 2011; Rossman, 1931; Zwick et al., 2017).

Inventors, especially those who are productive in generating patents, tend to have a high level of divergent thinking capabilities (Frosch et al., 2015; Martinsen & Diseth, 2011; Zwick et al., 2017). Inventors have a high level of divergent thinking, or at least are able to well control both divergent and convergent cognition. They can perceive and process diverse information, generate multiple ideas and alternatives that are original and novel, and easily detach from the existing concepts with flexibility to pursue new ideas. Divergent thinking is related to the cognition of inventors and explains their abilities to create inventions.

Second, inventors tend to be intrinsically motivated by novel, original, and challenging tasks (Forsgren, 1990; Giuri et al., 2007; Henderson, 2004; Owan & Nagaoka, 2011; Rossman, 1931). Studies on inventors suggest that inventors are intrinsically motivated to engage in inventive activities, which they think are novel, original, and challenging. Research by Rossman (1931) shows that the most frequently mentioned motivation for inventing by inventors is the love of inventing. Henderson (2004) found in his study that inventors' reason for doing inventing work is mostly due to intrinsic motivation. Prominent reasons for doing inventive work included intrinsic goals such as entertainment, exploration, happiness, creativity, and mastery. Extrinsic reasons such as fame and financial remuneration were not the major reasons for conducting inventive work. Using data from Japanese inventors, Owan and Nagaoka (2011) found that reasons related to intrinsic motivation, including interest in solving challenging problems and satisfaction, were highly related to inventors' productivity. Studies on creativity, which is closely related to inventions, further provide support for the intrinsic

motivation of inventors (Amabile, 1988; Anderson et al., 2014; Grant & Berry, 2011; Woodman, Sawyer, & Griffin, 1993; Zhou & Shalley, 2010).

Intrinsically motivated individuals engage in tasks for inherent satisfaction such as creativity, curiosity, interest, enjoyment, exploration, and enjoyment (Amabile & Pratt, 2016; Liu et al., 2016; Ryan & Deci, 2000). These individuals pursue tasks because of enjoyment and challenges of the activity itself, rather than extrinsic reasons like monetary rewards, fame, and career advancements. Intrinsically motivated individuals are highly engaged and committed to their tasks (Liu et al., 2016; Zhang & Bartol, 2010). They direct more attention to their work and spend effort and time to collect information, solve related problems, and generate creative alternatives for their work. Accordingly, intrinsic motivation about novel and creative tasks helps inventors to identify issues and seek creative solutions. Furthermore, engaged and committed inventors are more perseverant about their ideas even when there are obstacles and little monetary rewards or fame involved in the process (Colangelo, Assouline, Kerr, Huesman, & Johnson, 1993; Liu et al., 2016; Merrifield, 1979). Inventors stick to their ideas because they just want to be intrinsically satisfied and are less likely to give up pursuing their ideas. They pursue their goals even if there are many problems and obstacles that block the way, and can work tirelessly for long hours to pursue their ideas (Colangelo et al., 1993; Merrifield, 1979). Inventors are so deeply into their own ideas, they keep on pursuing their ideas even when other people doubt their beliefs or advise them to quit (Åstebro, Jeffrey, & Adomdza, 2007; Colangelo et al., 1993; Feist, 1998).

Individuals who have unique attributes of divergent thinking abilities and intrinsic motivation may be more likely to become inventors, or the experiences from the invention processes may have helped inventors to build these attributes. How inventors achieve high levels of these attributes may not be clear, but inventors in general hold these unique attributes. Developing and applying for a patent can be a long, complex, and costly process, which requires divergent thinking and perseverance (Park, 2010; Sandor, 1972). Not all findings in the research processes are patentable inventions, and it takes creativity, time, and effort to develop a patentable discovery and push through the patenting processes. Divergent thinking is required to generate, refine, and develop original ideas that are valuable enough to be patentable. Abilities to perceive broad array of information and generate multiple new alternatives that are different from existing concepts are capabilities required to generate an invention that is novel and unobvious enough to be protected as a patent (Fromer, 2010). Also, it takes resilience and commitment to be able to develop a patent, even when facing obstacles and uncertain expectations about the value of the idea. Inventors' strong focus on their ideas from intrinsic motivation enables them to hold onto complex invention processes which may seem impossible to solve, and this commitment results in inventions which cannot be achieved without constant effort. In sum, inventors tend to be divergent thinkers and intrinsically motivated by novel, creative, and challenging tasks. Studies about inventors provide theoretical and empirical support for these attributes of inventors. In the following section, I explain how CEOs with these attributes of inventors affect strategic change, strategic distinctiveness, and engagement in stakeholder management.

Inventor CEOs. Empirical studies suggest that a significant number of CEOs are inventors and that they have a large presence in the business world (Bostan & Mian, 2019; Islam & Zein, 2020). There are only handful of studies on CEOs with inventor background, but the results of the studies suggest that inventor CEOs have a significant influence on not only innovation performance, but also financial performance of the firm. Bostan and Mian (2019) showed that inventor CEOs have better innovation and stock market performance than non-inventor CEOs. Since inventor CEOs have experiences with the invention processes, they are likely to have higher levels of technical expertise, skills, and motivation to pursue inventive activities. Thus, firms with inventor CEOs produce better innovation outcomes in terms of patent quantity and quality. Firms who hire inventor CEOs also receive positive reactions from the stock market. Islam and Zein (2020) studied the influence of inventor CEOs and showed that firms led by inventor CEOs have a greater number of patents, better quality patents, and more valuable patents. Inventor CEOs are likely to have higher levels of technical expertise and skills required for inventions and can better assess and execute innovation related projects.

Despite the importance of inventor CEOs, there are only a handful of studies that examined the influence of inventor CEOs on the firm. Furthermore, no study in the management field has empirically studied the influence of inventor CEOs on firms' strategic decisions, including strategic change, strategic distinctiveness, and stakeholder management. There are only two recent studies in finance that examined the influence of inventor CEOs (Bostan & Mian, 2019; Islam & Zein, 2020). However, these studies mainly focus on the influence of inventor CEOs on firms' innovation related outcomes, without considering how the cognitive and motivational attributes of inventor CEOs can

affect their strategic decisions. Strategic change, strategic distinctiveness, and stakeholder management are important topics in the management field that deserve much attention. Considering that inventor background is an important and pronounced type of professional background among CEOs and inventor CEOs have significant presence in the business world, examining their impact on strategic decisions can greatly help us understand CEOs' influence on major strategic outcomes.

CHAPTER 3

HYPOTHESIS DEVELOPMENT

An inventor CEO is both a CEO and an inventor and holds the attributes of an inventor. The attributes of inventors apply to inventor CEOs who are CEOs with patents and affect their strategic decisions. Upper echelons theory suggests that attributes of CEOs from their experiences can affect firms' strategic outcomes (Hambrick & Mason, 1984). CEOs' background as an inventor works as a lens, through which CEOs search and interpret information, and make decisions accordingly. Their attention and information processing processes are influenced by their attributes (Dearborn & Simon, 1958; Ocasio, 1997).

Anecdotal evidence shows that inventor CEOs tend to pursue certain types of strategies. For example, Microsoft made many changes to its strategies after Satya Nadella, who is an inventor, became a CEO (Miller, 2019; Nadella, 2017). Microsoft reduced its emphasis on Windows operating systems, which was their representative product, and instead focused on becoming a major vendor of cloud computing services. Nadella also started partnerships with some of its competitors and made large acquisitions of companies like LinkedIn and GitHub. Nadella is also a CEO who has interests in stakeholder management (Jeans, 2020). He is one of the CEOs that signed a letter titled "Statement on the Purpose of a Corporation" which states the importance of stakeholders. Another example of strategic decisions by an inventor CEO would be major changes and unique strategies that Marissa Mayer pursued at Yahoo. Marissa Mayer started emphasizing the mobile sector (Pepitone, 2013) and developing media contents

(Shahani, 2016), which are some of the examples of strategic changes she made at Yahoo. She made multiple acquisitions (Newstalk, 2015; Pepitone, 2013), acquiring 16 startups just in the first year as a CEO, which is not an average strategy pursued by many firms.

In this study, I analyze inventor CEOs who are already organizational leaders in the CEO position, but with unique attributes of divergent thinking and intrinsic motivation that are likely to lead them to pursue certain strategic decisions. Building on studies about inventors and strategic leadership, I develop theoretical arguments suggesting that inventor CEOs pursue more strategic change, strategic distinctiveness, and effective stakeholder management compared to non-inventor CEOs. It is debatable whether inventors can become successful CEOs or not, but firms that are managed by CEOs with patents are likely to pursue certain types of strategic decisions.

Inventor CEOs and Strategic Change

Strategic change can be defined as a variance of resource allocation within a firm over time (Finkelstein & Hambrick, 1990; Haynes & Hillman, 2010; Zhang & Rajagopalan, 2010) and has a significant impact on the organization (Rajagopalan & Spreitzer, 1997). Strategic change captures the within-firm change in resource allocations over time in major dimensions, including advertising intensity, inventory level, plant and equipment newness, R&D intensity, non-production overhead, and financial leverage (Bednar, Boivie, & Prince, 2013; Finkelstein & Hambrick, 1990). Strategic change is not a rare event, and firms make strategic responses to changes in internal and external environments (Armenakis & Bedeian, 1999; Smith & Grimm, 1987; Zajac & Kraatz,

1993; Zajac & Shortell, 1989). However, there can be internal and external inertial pressures that make it difficult for firms to make changes successfully (Eisenstat, Spector, & Beer, 1990; Hannan & Freeman 1984; 1989). Changes require resource commitments and giving up stability and reliability. Initiating change is difficult and making successful changes according to plan is also difficult (MacKay & Chia, 2013). Micro level resistance from employees, including sense of discontinuity of identity, cynicism, stress, negative emotions, and anxiety may also hinder firms' capability to make changes (Bommer, Rich, & Rubin, 2005; Bovey & Hede, 2001; Dahl, 2011; Oreg, Vakola, & Armenakis, 2011; Venus, Stam, & van Knippenberg, 2019).

Empirical results show that the impact of strategic change on firm performance is indeed mixed, and making strategic changes can be beneficial or detrimental (Amburgey, Kelly, & Barnett, 1993; Haveman, 1992; Kelly & Amburgey, 1991; Kraatz & Zajac, 2001; Rajagopalan & Spreitzer, 1997; Singh, House, & Tucker, 1986; Smith & Grimm, 1987; Tushman & Rosenkopf, 1996; Zajac & Kraatz, 1993; Zajac & Shortell, 1989). Although it may be unclear whether strategic change can be beneficial or detrimental to firms in general, it is clear that capabilities of firms to change and adapt existing strategies are important factors that affect firms' chances of survival in a changing environment (Ginsberg, 1988; Rajagopalan & Spreitzer, 1997). Previous studies also found that strategic change can affect organizational outcomes other than performance. Strategic change affects the structure of the organization (Amburgey & Dacin, 1994), partnership termination (Cui, Calantone, & Griffith, 2011), influence of slack on performance (Bentley & Kehoe, 2020), TMT turnover (Wiersema & Bantel, 1993), and CEO compensation (Pathak, Hoskisson, & Johnson, 2014).

Reflecting the importance of making strategic changes for firms' survival, scholars in the management literature have widely studied topics related to the issue. For example, a stream of research in the organizational adaptation literature explores decisions resulting in organizational actions that decrease the disparity between the organization and the surrounding environment (Hrebiniak & Joyce, 1985; Sarta, Durand, & Vergne., 2021). Studies in this area of research cover diverse topics, including strategy making, routines, capabilities for change, organizational culture, institutional pressure, and organizational structure. Research about dynamic capabilities examines firm and managers' abilities to sense and seize opportunities, and reconfigure resources (Helfat & Martin, 2015; Teece, Pisano, & Shuen, 1997). Extant studies consider dynamic capabilities as a strong antecedent of strategic change. Innovation is another area that is closely related to strategic change (e.g., Hage, 1999; Tushman & O'Reilly, 2002). Some studies consider innovation as a type of change, while others examine innovation as a driver of change. Considering its significant impact on organizations and popularity in the management field, strategic change is an important topic that requires attention in order to understand how firms can survive and prosper in the long run.

Scholars have identified diverse factors as antecedents of strategic change. Environmental conditions, previous strategies, past performance, firm size, firm age, valuable resources of the firm, condition at the founding of the firm, and evaluation from the media have been identified as factors that affect strategic change (Audia, Locke, & Smith , 2000; Barker & Duhaime, 1997; Beck, Brüderl, & Woywode, 2008; Bednar et al., 2013; Boeker, 1989; Fombrun & Ginsberg, 1990; Ginsberg & Buchholtz 1990; Gordon, Stewart, Sweo, & Luker, 2000; Kelly & Amburgey, 1991; Kraatz & Zajac, 2001;

Kuusela, Keil, & Maula, 2017; Lant, Milliken, & Batra, 1992; Rajagopalan & Spreitzer, 1997; Smith & Grimm, 1987; Zajac & Kraatz, 1993; Zajac & Shortell, 1989). Among the determinants of strategic change, the influence of the decision makers in the firm has also been examined. Extant studies suggest that board of directors have influence on firms' strategic changes (Westphal & Fredrickson, 2001). Diverse board level aspects including board size, tenure, age, power, diversity, expertise, experiences, capital breadth and depth, and ability to evaluate and express opinions about strategies has been linked to strategic change (Goodstein & Boeker, 1991; Goodstein, Gautam, & Boeker, 1994; Golden & Zajac, 2001; Haynes & Hillman, 2010; Hoppmann, Naegele, & Girod, 2019; Lungeanu & Zajac, 2019; Oehmichen, Schrapp, & Wolff, 2017; Triana, Miller, & Trzebiatowski, 2014; Westphal & Bednar, 2005).

One important stream of research on determinants of strategic change focuses on the influence of CEOs. Extant studies suggest that CEOs have a profound influence on firms' strategic changes (Eggers & Kaplan, 2009; Rajagopalan & Spreitzer, 1997). Upper echelons theory suggests that firms are reflections of their CEOs' tendencies and attributes (Hambrick & Mason, 1984). Managerial mental activities and corresponding actions affect firms' strategic changes (Barr, 1998; Kiesler & Sproull, 1982; Tripsas & Gavetti, 2000), and CEOs' who are able to learn and constantly update their mental models to fit the environment can make appropriate strategic changes that will lead to superior performance (Barr, Stimpert, & Huff, 1992).

Despite the important influence of CEOs' professional backgrounds on their strategic decisions, literature review on strategic change shows a lack of studies about the

influence of CEOs' professional backgrounds. Although extant studies have greatly enhanced our understanding about the influence of CEOs on strategic change, existing studies have focused on other CEO characteristics, except for a handful of studies. Crossland and colleagues (2014) studied the degree of diversity in CEOs' professional and institutional experiences and found that it positively affects strategic change. CEOs with higher level of career variety prefer novelty, openness, and change, which lead to more changes in their strategies. Le and Kroll (2017) examined CEOs' international work experiences and found a positive relationship between such experiences and strategic change. What has been largely missing in the literature is the impact of professional backgrounds of CEOs on strategic change. In this study, I identify a CEO's background as an inventor as an important professional background that can substantially influence strategic change. I explain that CEOs with background as inventors hold unique attributes, and that they have the ability and motivation to make strategic changes.

First, inventor CEOs tend to be divergent thinkers and are more able to consider strategies that are different from the past (Frosch et al., 2015; Martinsen & Diseth, 2011; Mieg, 2011; Rossman, 1931; Wolf & Mieg, 2010; Zwick et al., 2017). Inventor CEOs' divergent thinking abilities allow them to perceive and process diverse information and alternatives, generate multiple novel ideas and options, and easily dissociate from existing concepts to pursue new ideas (Amabile, 1988; Benedek et al., 2012; Gino & Ariely, 2012; Runco, 2010, Runco & Acar, 2012). These abilities of inventor CEOs are closely related to the capabilities of the firms and managers to sense and seize opportunities, and reconfigure strategic assets to pursue changes (Adner & Helfat, 2003; Eisenhardt & Martin, 2000; Helfat & Peteraf, 2015; Teece, 2007).

Being able to perceive and process diverse information and alternatives are closely related to the capabilities of the firm and managers to sense opportunities for strategic change (Amabile, 1988; Helfat & Peteraf, 2015; Runco & Acar, 2012; Teece, 2007). Managers who can quickly sense opportunities for changes are better at making strategic changes than others. In order to sense these opportunities for change, managers need to be able to effectively capture diverse information in the environment and process them quickly to perceive the opportunities better and faster than their competitors. Inventor CEOs who are divergent thinkers can perceive and process diverse information and alternatives, which allow them to better sense the opportunities for strategic change.

Abilities to generate multiple novel ideas and alternatives are also essential for making strategic changes because they are closely related to the capabilities to seize opportunities for change (Helfat & Peteraf, 2015; Teece, 2007). After sensing the opportunities for change, firms and managers need to develop feasible plans and take actions to seize the opportunities. Inventor CEOs who are divergent thinkers are able to develop multiple novel alternatives to the existing strategies, and utilize these new options to seize opportunities that they sense in the environment (Benedek et al., 2012; Runco, 2010; Wolf & Mieg, 2010).

Inventor CEOs who are divergent thinkers can further excel at detaching themselves from existing strategies to focus on new strategies, compared to non-inventor CEOs. Capabilities of the firm and the managers to reconfigure, transform, and realign strategic assets are important for making changes (Helfat & Peteraf, 2015; Teece, 2007). After firms sense and seize opportunities for change in the environment, they need to be

able to reconfigure resources to fully implement changes. Inventor CEOs who are divergent thinkers have the abilities to easily dissociate from existing strategies (Benedek et al., 2012; Gino & Ariely, 2012; Mednick, 1962). They can detach themselves from the current strategies without difficulties and focus their attention on new strategies. This helps them to reallocate resources from areas related to previous strategies to areas that require more support in order to fully pursue and implement new strategies.

Second, inventor CEOs tend to be intrinsically motivated by novel and creative tasks, and can better pursue strategic change compared to non-inventor CEOs (Forsgren, 1990; Giuri et al., 2007; Henderson, 2004; Owan & Nagaoka, 2011; Rossman, 1931). Whereas divergent thinking is more related to the abilities to make changes, intrinsic motivation can further explain why inventor CEOs want to pursue strategic changes. Strategic change is similar to inventive activities in a sense that it requires novelty, creativity, and innovativeness, and inventor CEOs who are intrinsically motivated by tasks with such characteristics are likely to be intrinsically motivated by strategic change (Vallerand, 1997; Wiersema & Bantel, 1992). Inventor CEOs who are intrinsically motivated by novel and creative tasks find enjoyment, happiness, and satisfaction from pursuing changes that require new and different strategies compared to the existing strategies. They are more engaged in and committed to making strategic changes, and they direct more attention to sensing diverse information for changes, seizing opportunities by developing new strategies, and reconfiguring resources for making strategic changes (Amabile & Pratt, 2016; Helfat & Peteraf, 2015; Liu et al., 2016; Teece, 2007). CEOs with an inventor background are more likely than those without such a background to be intrinsically motivated to attend to strategic changes, and their

decisions and effort are geared more toward making strategic changes (Ocasio, 1997). Inventor CEOs are also more likely to be resilient and perseverant about pursuing strategic changes compared to non-inventor CEOs due to high levels of engagement and commitment from intrinsic motivation. Even if there are many obstacles and low levels of extrinsic rewards like incentives, bonuses, fame, and career benefits, inventor CEOs will still pursue strategic changes to feel intrinsically satisfied to see the strategies being implemented.

In sum, inventor CEOs are more likely to make choices to pursue changes in strategies and implement the strategies because they are divergent thinkers and intrinsically motivated individuals. In contrast, non-inventor CEOs who do not possess such attributes are less likely to think of multiple new strategies. Even when they make decisions to pursue changes in strategies, they are less likely to stick to the strategies when they face resistance and negative feedback from others or see no extrinsic rewards involved. Inventor CEOs are more likely than non-inventor CEOs to pursue strategic changes because they can come up with ideas and alternatives for strategic changes and have what it takes to fully implement the strategies. Thus,

Hypothesis 1 (H1): Firms managed by inventor CEOs will have a higher level of strategic change than firms managed by non-inventor CEOs.

Building on studies on inventors, I have explained how inventor CEOs with unique attributes affect firms' strategic changes. In the following section, I explain how inventor CEOs tend to pursue more distinctive strategies compared to non-inventor CEOs.

Inventor CEOs and Strategic Distinctiveness

Strategic distinctiveness can be defined as the degree of deviance in a firm's strategy from the strategies of other firms in the industry (Crossland et al., 2014; Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997). Whereas strategic change is the within-firm change in resource allocation over time, strategic distinctiveness captures differences in resource allocation patterns between firms. Extant studies suggest that pursuing distinctive strategies can be both beneficial and detrimental for organizations (Chen & Hambrick, 1995; Geletkanycz & Hambrick, 1997; Litov, Moreton, & Zenger, 2012; Ramaswamy, 1997; Zenger, 2013). On the one hand, being able to differentiate from competitors and deviate from the established practices reduces competition, which is essential for firms to achieve sustained competitive advantages and superior performance (Barney, 1996; Finkelstein et al., 2009; Litov et al., 2012; Porter, 1979; Miller & Chen, 1996). On the other hand, imitating others' choices reduces costs and risks, and provides legitimacy (Deephouse, 1999; DiMaggio & Powell, 1983; Lieberman & Asaba, 2006). Deephouse (1999) suggested that balancing between strategic distinctiveness and conformity is important and being as distinctive as possible will lead to better performance as long as the strategies are legitimate. Capturing the accurate level of strategic distinctiveness that can result in superior firm performance can be a difficult task, but extant studies suggest that strategic distinctiveness is one of the important factors that affect organizational performance.

Extant studies have examined diverse factors that can affect firms' strategic distinctiveness, such as breadth and depth of board capital and involvement of family

members (Haynes & Hillman, 2010; Miller, Breton-Miller, & Lester, 2013). Influence of CEOs has been examined in the literature as an important determinant of strategic distinctiveness. Finkelstein and Hambrick (1990) found that executives with longer tenures pursue strategies that conform more to the average strategies of other firms in the industry. Executives with long tenures are well established, and they try to avoid unnecessary risks since they have much to lose. As tenure increases, executives' perception becomes rigid and restricted, and their risk-taking tendencies decrease, resulting in more strategic conformity. Geletkanycz and Hambrick (1997) studied the influence of top executives' external ties on strategic distinctiveness. This study suggested that intraindustry ties lead to more strategic conformity and extraindustry ties result in more distinctive strategies. Extraindustry ties work as a channel that delivers novel information about practices of firms that are outside the industry boundary. Intraindustry ties mainly provide information about practices and norms of firms within the industry. Although the positive influence of intraindustry ties on strategic conformity was only partially supported by their findings, the results of the study showed the different effects of two distinct types of external ties on strategic distinctiveness in general.

Carpenter (2000) found that compensation of CEOs can affect firms' strategic distinctiveness. Results of the study showed that long-term pay and long-term pay structure increased strategic distinctiveness. Long-term pay aligns the interest of mangers with the interests of shareholders, thereby encouraging risk taking and long-term plans. An interesting finding about one of the traits of CEOs is that CEO affective traits influence strategic distinctiveness (Delgado-García, La Fuente-Sabaté, & Manuel, 2010).

Positive affective traits foster strategic distinctiveness and negative affective traits promote strategic conformity to industry means. As in other settings, CEO power is also an important factor that needs to be considered related to strategic distinctiveness. CEOs that have great power compared to other executives are able to pursue distinctive strategies, if the CEO wishes to deviate from the industry standards (Tang, Crossan, & Rowe, 2011).

Although previous studies suggest the importance of CEOs as determinants of strategic distinctiveness, the influence of CEOs' professional backgrounds has been largely neglected in the literature. Crossland and colleagues' (2014) study about the influence of professional experiences of CEOs across different industries, firms, and functional areas is the only study that analyzed the relationship between professional backgrounds of CEOs and strategic distinctiveness. Crossland and colleagues (2014) introduced CEO career variety, which is the degree of diversity in professional and institutional experiences, as a CEO characteristic that positively affects strategic distinctiveness. In this study, I suggest that a CEO's background as an inventor is a unique professional background that can affect a firm's strategic distinctiveness. Inventor CEOs have influences on the firm as an inventor and a CEO, and deserve attention as an important type of CEO that has a large presence in the business world. In the following paragraphs, I argue that inventor CEOs pursue more strategic distinctiveness compared to non-inventor CEOs.

First, inventor CEOs tend to be divergent thinkers and are more likely to consider strategies that are different from other firms in the industry than non-inventor CEOs

(Frosch et al., 2015; Martinsen & Diseth, 2011; Mieg, 2011; Rossman, 1931; Wolf & Mieg, 2010; Zwick et al., 2017). Because inventor CEOs tend to have high levels of divergent thinking abilities, they can utilize diverse information and choices, generate uncommon and new ideas, and easily detach themselves from previously set concepts (Amabile, 1988; Benedek et al., 2012; Gino & Ariely, 2012; Runco, 2010, Runco & Acar, 2012). This allows inventor CEOs to think of strategies that are uncommon, novel, and original. Inventor CEOs can make more remote associations between information and dissociate from common strategies more easily, which help them generate ideas for strategies that are different from the norm. They can move away from industry standards more easily and evaluate multiple alternatives that fit their needs. Furthermore, rather than relying on one conventional idea, divergent thinking is related to considering multiple alternatives and options, which increases the possibility of generating differentiated strategies.

Second, inventor CEOs are more likely to be intrinsically motivated by creative and original tasks, and have a better chance of pursuing distinctive strategies compared to non-inventor CEOs (Forsgren, 1990; Giuri et al., 2007; Henderson, 2004; Owan & Nagaoka, 2011; Rossman, 1931). Divergent thinking abilities of inventor CEOs explain why inventor CEOs can pursue distinctive strategies, and intrinsic motivation explains why they are willing to follow differentiated strategies. Inventor CEOs who are intrinsically motivated by inventive activities are likely to be intrinsically motivated by distinctive strategies because they have similar characteristics (Vallerand, 1997). Similar to engaging in inventive activities, generating strategies that are different from the norm requires uncommonness, creativity, love for exploration, and innovativeness (Fromer,

2010; Henderson, 2004). Inventor CEOs tend to be intrinsically motivated about distinctive strategies, and feel happiness, enjoyment, and satisfaction from pursuing such strategies. Even if there are no extrinsic rewards like incentives, bonuses, fame as a CEO, and career benefits, inventor CEOs will still pursue distinctive strategies to feel intrinsically satisfied while developing and implementing the strategies.

In sum, inventor CEOs are more likely than their peers to pursue distinctive strategies because they tend to be divergent thinkers and intrinsically motivated by uncommon and creative strategies. Non-inventor CEOs who do not possess divergent thinking attributes are less likely to be able to generate uncommon or original strategies. They are also less likely to be strongly motivated to pursue distinctive strategies when extrinsic rewards are not clear, or when they face difficulties in the process. Inventor CEOs are more likely than non-inventor CEOs to pursue distinctive strategies because they have the cognitive ability and motivation to develop and implement uncommon and differentiated strategies. Thus,

> *Hypothesis 2 (H2): Firms managed by inventor CEOs will have a higher level of strategic distinctiveness than firms managed by non-inventor CEOs.*

In the following section, I argue that inventor CEOs tend to pursue strategies that considers multiple stakeholders, compared to non-inventor CEOs.

Inventor CEOs and Stakeholder Management

Since Freeman (1984) suggested the importance of stakeholders for firms, scholars have paid much attention to the management of stakeholders (Parmar et al.,

2010; Walsh, 2005). Stakeholders are groups and individuals that are affected by, and can affect firms (Freeman, 1984; Harrison, Bosse, & Phillips, 2010). Diverse actors related to the firm are often considered as stakeholders, including shareholders, investors, employees, customers, suppliers, community, and the natural environment (Clarkson, 1995; Hillman & Keim, 2001). Stakeholder management is the extent to which a firm considers and caters to the diverse demands of multiple stakeholders in developing and implementing strategies (Bettinazzi & Feldman, 2019; Gamache, Neville, Bundy, & Short, 2020). Stakeholder management is related to, but not equal to CSR. CSR focuses on social issues, while stakeholder management is focused on effectively managing the needs of diverse stakeholders (Hillman & Keim, 2001). CSR is often perceived as a broader term that incorporates stakeholder management (Hillman & Keim, 2001; Shropshire & Hillman, 2007).

Selecting the scope of stakeholders that firms need to attend to has been a long-held issue for both academics and practitioners (Freeman, 1984; Friedman, 1970). Those who favor a narrower scope of stakeholders focus on generating value for shareholders, while those who advocate for a broader scope emphasize inclusion of stakeholders in diverse areas such as community relations, environment, product safety, employee relations, and diversity. A view that focuses on shareholders suggests that shareholders are the owners of the firm, and thus their interest should be the main focus (Friedman, 1970; Marcoux, 2003). Focusing on other stakeholders may be viewed as a government's responsibility rather than a firm's responsibility, and a misuse of resources that could have been utilized to increase shareholder returns (Friedman, 1970; Levitt, 1958). Some scholars would argue that firms' major responsibility is to generate profit and should only

invest in activities that satisfy such responsibility (Danielson, Heck, & Shaffer, 2008; Jensen, 2002). On the other hand, the stakeholder perspective has argued that satisfying the demands of not only the shareholders, but also diverse stakeholders is required to retain their support, which can lead to better organizational outcomes (Blair, 1998; Bosse, Phillips, & Harrison, 2009; Freeman, 1984; Harrison et al., 2010; Harrison & Wicks, 2013). There can be different foundations or approaches for stakeholder management, but they all suggest that identifying and catering to the diverse demands of key stakeholders are important activities for firms (Blair, 1998; Carroll, 1991, 1999; Donaldson & Preston, 19995; Hill & Jones, 1992; Jones & Wicks, 1999).

Although there may be different beliefs about the scope of stakeholders that firms should consider, it is clear that stakeholder management has a great influence on the firm. Literature on stakeholder management suggests that organizations can benefit from catering to a broad group of stakeholders, resulting in competitive advantages and superior firm performance (Choi & Wang, 2009; Harrison et al., 2010; Jones, 1995). Firms need to ensure that valuable stakeholders are satisfied enough to be willing to continue their interdependent relationships (Clarkson, 1995). Effective stakeholder management can gather support from diverse stakeholders based on trust and cooperation, and reduce commitment problems including agency costs and transaction costs, resulting in competitive advantages (Harrison et al., 2010; Henisz, Dorobantu, & Nartey, 2014; Jones, 1995). By treating stakeholders properly, firms can expect more reciprocity in terms of support from the stakeholders (Bosse et al., 2009). Stakeholders are willing to provide more support for firms that they care about, and a good relationship with stakeholders can be a resource that is valuable, rare, and difficult to imitate (Choi &

Wang, 2009; Hillman & Keim, 2001). Based on the support from stakeholders, effective stakeholder management can help firms exploit opportunities and identify threats (Hart & Sharma, 2004; Yaziji, 2004).

Results from empirical studies on the relationship between stakeholder management and firms' financial performance also show positive results in general (Choi & Wang, 2009; Henisz et al., 2014; Orlitzky, Schmidt, & Rynes, 2003; Preston & Sapienza, 1990). de Luque, Washburn, Waldman, and House (2008) found that subordinates perceive CEOs who care about stakeholders as having visionary leadership, resulting in better firm performance. Hillman and Keim (2001) showed that focusing on social issues may not result in better firm performance, but emphasizing relationships with stakeholders does pay off, leading to higher financial performance. Managing relationships with stakeholders for moral commitment might not provide benefit for firms, but stakeholder management for instrumental values can provide superior financial performance (Berman, Wicks, Kotha, & Jones, 1999). Interacting with stakeholders can also provide benefits other than financial performance, including innovation and diversification (Gao & Slawinski, 2015; Hart & Sharma, 2004; Jiang, Wang, Zhou, & Zhang, 2020).

Although most of the studies are not strictly focused on stakeholder management and focused more on CSR, scholars have examined external and internal factors that affect firms' tendency to consider the interest of stakeholders (Aguinis & Glavas, 2012; Bansal & Roth, 2000; Basu & Palazzo, 200; Brower & Mahajan, 2013; Buehler & Shetty, 1974; Ioannou & Serafeim, 2012; Rupp & Mallory, 2015; Wood, 1991). Firms may

consider stakeholders' interests to secure legitimacy and support from stakeholders, to comply with institutional pressure, to gain competitiveness and profit, or as a social obligation at the firm or the executive level. Firms that can better manage the complex relationships with diverse stakeholders have high levels of stakeholder management capability (Freeman, 1984; Hart & Sharma, 2004; Jiang et al., 2020; Wickham & Wong, 2009; Zakhem, 2008). Stakeholder management capability is an ability to develop and manage relationships with diverse stakeholders (Jiang et al., 2020; Zakhem, 2008). The process of stakeholder management requires firms and managers to be able to identify and understand the diverse and often competing interests of stakeholders (Freeman 1984; Gao & Slawinski, 2015; Hart & Sharma, 2004). Firms and their managers with high levels of stakeholder management capabilities are able to 1) identify and perceive multiple stakeholders and their diverse interests, 2) structure and align organizational processes with the interests of stakeholders, and 3) negotiate and balance transactions with stakeholders to satisfy their competing interests.

Among these studies about the antecedents of stakeholder management, the influence of CEOs on stakeholder management has been researched by scholars. Extant studies suggest that CEOs have a profound impact on stakeholder management decisions (Agle, Mitchell, & Sonnenfeld, 1999; Fong, 2010; Hambrick & Finkelstein, 1984; Jones & Wicks, 1999). CEOs are agents of important stakeholders and need to cater to the demands of these stakeholders (Goodpaster, 1991; Hill & Jones, 1992). Stakeholders' needs can be satisfied when CEOs identify and perceive their needs (Agle et al., 1999; Bundy, Shropshire, & Buchholtz, 2013; Henriques & Sadorsky, 1999). In their study, Agle and colleagues (1999) found that CEOs' perceptions of stakeholder attributes are

important factors in deciding the degree of attention given to stakeholders. Furthermore, Bundy and colleagues (2013) also found that the salience of stakeholders' issues perceived and understood by managers affects how the demands of stakeholders are managed by firms.

CEOs can pursue stakeholder strategies based on agency logic or stakeholder logic (Gamache et al., 2020; Ioannou & Serafeim, 2015). CEOs who focus more on agency logic would emphasize shareholder dominance and pursue governance-oriented stakeholder strategies in order to reduce agency costs. CEOs that favor stakeholder logic would focus on satisfying the needs of broader group of stakeholders, thus pursuing socially-oriented stakeholder strategies that consider diverse stakeholders. Chin and colleagues (2013) studied the relationship between CEOs' political ideologies and firms' commitment to stakeholders and found that liberal CEOs are more likely to care about management of stakeholders compared to conservative CEOs. CEOs who believe in the market economy system tend to believe that catering to demands of stakeholders can result in economic value for the firm, thus engage in more effective stakeholder management (Hafenbrädl & Waeger, 2017). However, CEOs who believe in the market economy system may not believe that social issues are significant problems in the system, resulting in less emotional reactions to and less engagement in social issues.

Research by Gamache and colleagues (2020) is one of the studies that directly examined the influence of CEO characteristics on stakeholder management. The authors found that a CEO's prevention focus is positively related to the firm's engagement in governance-oriented stakeholder strategies, whereas a CEO's promotion focus is

positively related to engagement in socially-oriented stakeholder strategies. Also, narcissistic CEOs tend to pursue more effective stakeholder management, but hubristic CEOs tend to have less interest in coping with stakeholders (Petrenko, Aime, Ridge, & Hill, 2016; Tang, Mack, & Chen, 2018; Tang, Qian, Chen, & Shen, 2015). Narcissistic CEOs seek constant attention and affirmation of their positive self-view and initiate strategies that involve multiple stakeholders, whereas hubristic CEOs' overconfidence leads them to overestimate their possibility of success without stakeholders and underestimate the resources that stakeholders can provide.

Shropshire and Hillman (2007) found that CEOs have significant influence on firm level shifts in stakeholder management. They found that CEO discretion has a positive influence on changes in stakeholder management because a higher level of CEO discretion means they can afford to make large changes. Owner-manager controlled firms and firms with CEOs who own more shares are less likely to make large shifts in stakeholder management because they become more loss-averse. CEOs' compensation structure also has an impact on stakeholder management. For example, Fong (2010) found that CEO pay fairness is related to stakeholder management. Underpaid CEOs decrease stakeholder management, whereas overpaid CEOs increase stakeholder management. Also, because stakeholder management can decrease CEO compensation, CEOs may not want to engage in stakeholder management activities (Coombs & Gilley, 2005). These studies on CEO compensation and stakeholder management suggest that the compensation structure of CEOs can increase or decrease firms' engagement in stakeholder relations. Compensating for stakeholder management activities directs

executives' attention to stakeholders' interests, resulting in better management of stakeholders' demands.

Although these studies about diverse CEO characteristics have greatly enhanced our understanding about the influence of CEOs on stakeholder management, the impact of CEOs' professional backgrounds has been largely neglected in the literature. Few existing studies in this stream of research focus on CSR, rather than stakeholder management. CEOs with backgrounds in output functions are associated with better CSR scores than those with backgrounds in throughput functions (Thomas & Simerly, 1994). The breadth of CEO's experiences is also positively related to CSR (Manner, 2010). Slater and Dixon-Fowler (2009) found that CEOs with international assignment experiences deliver better CSR. Other than these studies, the influence of professional backgrounds of CEOs has been largely neglected. Considering that professional backgrounds can capture CEOs' knowledge, skills, abilities, and other attributes, more studies on diverse aspects of CEOs' professional backgrounds can enhance our understanding about CEOs as determinants of stakeholder management. In the following section, I identify inventor background of a CEO as an important but neglected CEO professional background that can influence firms' stakeholder management. I explain that inventor CEOs' unique attributes allow them to recognize and process complex and variety of information, leading to more inclusive stakeholder management compared to non-inventor CEOs.

First, inventor CEOs, who tend to be divergent thinkers, can better recognize and process variety of information and perspectives from multiple stakeholders compared to

their peers, engaging in more effective stakeholder management. Studies suggest that inventors are likely to be divergent thinkers (Frosch et al., 2015; Martinsen & Diseth, 2011; Mieg, 2011; Rossman, 1931; Wolf & Mieg, 2010; Zwick et al., 2017). Inventor CEOs who possess the attributes of inventors are divergent thinkers and can recognize and consider broader set of information and options, make linkages between varieties of information, and easily detach themselves from one concept to another concept, allowing them to switch between information (Amabile, 1988; Benedek et al., 2012 Gino & Ariely, 2012; Runco, 2010; Runco, 2014; Runco & Acar, 2012). These attributes of inventor CEOs are linked to the ability of firms and managers to develop and manage relationship with diverse stakeholders and their conflicting interests (Freeman, 1984; Hart & Sharma, 2004; Jiang et al., 2020; Wickham & Wong, 2009; Zakhem, 2008). Managers with these abilities can 1) identify and perceive multiple stakeholders and their diverse and conflicting interests, 2) align organizational processes with stakeholders' interests and structure it accordingly, and 3) negotiate and balance transactions with stakeholders to cater to their diverse interest.

Previous studies provide support for the importance of CEO's ability to recognize, process, and coordinate diverse demands from multiple stakeholders in pursuing stakeholder management activities (Gröschl, Gabaldón, & Hahn, 2019; Hahn, Preuss, Pinkse, & Figge, 2014; Rupp, Skarlicki, & Shao, 2013; Sharma & Henriques, 2005; Yang, Wang, Zhou, & Jiang, 2019). CEOs that have a complex, inclusive, and integrative mindset can better recognize and integrate diverse information and perspectives than others. This capability of CEOs to identify, understand, and integrate variety of information and perspectives is essential for firms to initiate and adopt stakeholder

management activities. CEOs who have lower levels of these capabilities have difficulties in considering multiple information and alternatives, and are more likely to focus only on few stakeholders or shareholders. In contrast, CEOs who can recognize and process variety of information and perspectives are aware of the demands of multiple stakeholders at a broader level, and can understand and meet the needs of multiple stakeholders. Compared to others, these CEOs who can process conflicting and complex information can better consider and coordinate variety of information from multiple stakeholders, with better chances of satisfying their needs.

Inventor CEOs' abilities to recognize and consider diverse information and options align with the ability of the managers to identify and perceive multiple stakeholders and their diverse interest, which results in stakeholder management that considers diverse stakeholders (Amabile, 1988; Runco & Acar, 2012 Wickham & Wong, 2009; Zakhem, 2008). Considering that there are many stakeholders who have diverse and often conflicting demands, managers first need to be able to identify multiple stakeholders and their needs. After identifying relevant stakeholders and their interests, managers who can understand and process relevant information can better pursue stakeholder management that incorporates the interest of these stakeholders. Inventor CEOs who are divergent thinkers have what it takes to successfully identify and process multiple stakeholders and their diverse interests.

Inventor CEOs' abilities to consider multiple information and make connections between them while not being obsessed with just one option are also important for taking a broader approach to stakeholder management because they are related to aligning

organizational processes with the stakeholders' needs (Amabile, 1988; Benedek et al., 2012; Mednick, 1962; Runco, 2014; Wickham & Wong, 2009; Zakhem, 2008). In order to manage complex relationships with diverse stakeholders, managers need to restructure and align the organization according to stakeholders' demands, based on the list of stakeholders and related information that they identified. Inventor CEOs are divergent thinkers, and they can well align diverse organizational processes with diverse interests of multiple stakeholders, resulting in well-established stakeholder management that incorporates broad group of stakeholders.

Inventor CEOS are also likely to be better at negotiating and executing transactions with diverse stakeholders, maintaining a win-win situation for everyone. CEOs that excel at managing good relationships with diverse stakeholders have the ability to balance transactions with stakeholders, creating value for the organization and multiple stakeholders (Wickham & Wong, 2009; Zakhem, 2008). Inventor CEOs who are divergent thinkers can effectively analyze and implement transactions so that values are created for multiple stakeholders because they can recognize and process multiple transactions and the value they are creating, without being obsessed with just one option (Amabile, 1988; Gino & Ariely, 2012; Runco & Acar, 2012).

Divergent thinking of inventor CEOs can help them better implement their decisions that consider multiple stakeholders' needs compared to non-inventor CEOs. Structuring and aligning organizational processes with stakeholder interests and engaging in transactions with stakeholders accordingly can be a complex process. Implementation of decisions that can meet the demands of multiple stakeholders requires integration and

coordination of diverse set of resources. CEO's abilities to integrate, reconfigure, and coordinate resources are required for implementing stakeholder management activities (Cai & Zhou, 2014; Huang & Li, 2017). Realizing decisions that consider diverse demands into actual strategies and processes requires coordination and integration of additional resources and new processes that do not need to be considered when focusing only on shareholders or small number of stakeholders. Firms with better coordination and integration abilities can easily make required changes and adopt stakeholder related issues into their routines. Divergent thinking of inventor CEOs allows them to better manage the complex processes required to implement these decisions than their peers.

Due to their attributes, inventor CEOs are more apt to identify multiple stakeholders, capture and process their diverse and conflicting demands, and consider diverse options to satisfy multiple demands, achieving stakeholder management that includes broader set of stakeholders. Engaging in stakeholder management activities requires the firm to consider diverse demands of multiple stakeholders and relevant information from them (Freeman, 1984; Slater & Dixon-Fowler, 2009; Zakhem, 2008). Identifying and analyzing the interests of diverse stakeholders are not easy. In order to take responsibility for not only shareholders but also other stakeholders including the society, environment, employees, and consumers, firms need to be able to recognize, understand, and process diverse information about all stakeholders. Furthermore, managers need to be able to structure organizations' procedures to reflect diverse stakeholders' requests, and manage the transactions with stakeholders so they can create value for them. Cognitively divergent inventor CEOs' capabilities to recognize, understand, integrate, and process complex information allow them to meet the diverse,

complex, and conflicting demands of multiple stakeholders. Compared to non-inventor CEOs, inventor CEOs are better capable of dealing with diverse demands of multiple stakeholders, and they can make and implement decisions that satisfy multiple stakeholders, resulting in more effective stakeholder management.

Second, inventor CEOs who tend to be intrinsically motivated by novel, challenging, and creative tasks are likely to be more committed to strategies that incorporate broader group of stakeholders, compared to their non-inventor peers (Amabile & Pratt, 2016; Forsgren, 1990; Giuri et al., 2007; Henderson, 2004; Owan & Nagaoka, 2011; Rossman, 1931). Inventor CEOs are intrinsically motivated by pursuing challenging, complex, explorative, and creative tasks. Engaging in stakeholder management is a challenging task that requires explorative and creative strategies. Firms need to identify and cater to multiple and often competing interests of diverse stakeholders, which can be a difficult and complex task (Hall & Vredenburh, 2005; Winn, 2001). Perfectly identifying and processing relevant information about all stakeholders are nearly impossible to achieve, and furthermore, satisfying diverse and conflicting demands of stakeholders is not easy. In order to pursue stakeholder management, managers need to have what it takes to generate and implement complex and creative strategies to cater to diverse stakeholders. Inventor CEOs who are intrinsically motivated by challenging and creative inventive activities are more likely to pursue stakeholder management which has similar characteristics, requiring complex and creative solutions (Vallerand, 1997). Thus, they are more committed to identifying and processing diverse information from multiple stakeholders and structuring organizational

processes to create value for diverse stakeholders (Wickham & Wong, 2009; Zakhem, 2008).

Furthermore, inventor CEOs tend to be more resilient about stakeholder management because they are intrinsically motivated. Studies about inventors suggest that inventor CEOs are intrinsically motivated by inventive activities, which explains their perseverant characteristic (Amabile, 1988; Anderson et al., 2014; Forsgren, 1990; Giuri et al., 2007; Grant & Berry, 2011; Henderson, 2004; Owan & Nagaoka, 2011; Rossman, 1931; Woodman et al., 1993; Zhou & Shalley, 2010). Inventor CEOs have strong beliefs about their ideas and work hard to develop them until they are successful, even if there are obstacles or negative views about their ideas (Åstebro et al., 2007; Colangelo et al., 1993; Feist, 1998; Merrifield, 1979). Intrinsically motivated inventor CEOs are more likely to strongly pursue their goals even without extrinsic rewards. These inventor CEOs who tend to have higher levels of perseverance are also intrinsically motivated by stakeholder management which has similar characteristics, and can make decisions that effectively meet stakeholders' demands and successfully implement them. Conflicting demands from multiple stakeholders will generate difficulties, and pursuing activities that satisfy their diverse demands may provide less monetary rewards compared to directly pursuing financial goals. Making decisions that can satisfy multiple stakeholders' needs can be a long and complex process with many difficulties. Improving relationships with diverse stakeholders takes time, and firms are more likely to benefit from stakeholder management activities not in the short run, but in the long run (e.g., Kang, 2016). Processing diverse and complex information from multiple stakeholders itself can be difficult, and oppositions between and from the

stakeholders can further increase the challenges of decision making because all stakeholders tend to argue for decisions that are favorable to themselves. Even if the final decisions have been made after considering multiple stakeholders' demands, implementing the decisions can also be hard. Engaging in stakeholder management activities requires a different set of processes and additional complex resource allocation and management, which can be risky and detrimental for the firm, at least in the short run (Eccles, Ioannou, & Serafeim, 2014; Kang, 2016). There will also be constant oppositions from stakeholders who are not fully satisfied with the decisions. However, inventor CEOs are intrinsically motivated by aspects of stakeholder management that are similar to invention, and they are strongly committed to pursuing their decisions. Despite difficulties involved in making strategic decisions to pursue stakeholder management, intrinsic motivation of inventor CEOs makes them initiate and implement strategies that they believe in.

To summarize, inventor CEOs tend to be divergent thinkers and intrinsically motivated individuals, and these attributes meet the requirements for pursuing stakeholder management. Engaging in stakeholder management requires recognizing and processing complex information to satisfy diverse needs of multiple stakeholders. Furthermore, organizational processes and transactions with stakeholders need to be structured and aligned to meet the diverse and conflicting interest of stakeholders. Compared to other CEOs, CEOs with background as an inventor can better recognize and process diverse conflicting demands and information from multiple stakeholders, and deal with difficulties related to managing complex relationships with stakeholders. Inventor CEOs are also likely to be intrinsically motivated by challenges and

complexities in stakeholder management, and enjoy coming up with novel solutions that can help them cater to stakeholders' needs. Intrinsically motivated inventor CEOs are engaged in and committed to stakeholder management, and once they decide to pursue such activities, they push forward to fulfill their objectives even when they face obstacles. On the other hand, non-inventor CEOs tend to lack the attributes that inventor CEOs have. They will have more difficulties in identifying and understanding complex and diverse demands from stakeholders. Because non-inventor CEOs are not intrinsically motivated by pursuing stakeholder management, they are less committed to engaging in activities that consider diverse stakeholders, compared to inventor CEOs who strongly believe in pursuing such activities even when there are obstacles or no monetary and career rewards involved. Thus, firms with inventor CEOs are more likely than firms with non-inventor CEOs to put in time and effort in stakeholder management. Thus,

> *Hypothesis 3 (H3): Firms managed by inventor CEOs will have more effective stakeholder management than firms managed by non-inventor CEOs*.

Building on studies on inventors, I have explained how inventor CEOs affect important strategic decisions. Divergent thinking of inventor CEOs make them pursue strategic change, strategic distinctiveness, and stakeholder management. Inventor CEOs are also likely to be intrinsically motivated, which makes them fully pursue the strategic decisions that they make even when there are difficulties involved in the processes. In the following section, I explain how situations inside and outside the firm that support inventor CEOs to pursue their decisions affect their influence on strategic change, strategic distinctiveness, and stakeholder management. A CEO's discretion, which is the

latitude of actions that a CEO can take, is an important factor in the upper echelons literature that explains when and how a CEO can influence strategic outcomes (Hambrick & Finkelstein, 1987; Hambrick, 2007). A CEO may be viewed as the most powerful individual in a firm. However, a CEO's ability to pursue the decisions that they favor at the firm level depends on internal and external factors that can restrict the discretion of CEOs.

Moderating Effect of CEO Power

CEO power refers to the potential for the CEO to pursue own objectives (Combs, Ketchen, Perryman, & Donahue, 2007). Although a CEO is generally viewed as the most powerful individual in an organization with tremendous impact on strategic outcomes, their impact is restricted by the amount of power they have (Daily & Johnson, 1997; Finkelstein et al., 2009; Hambrick & Finkelstein, 1987; Haynes & Hillman, 2010; Krause, Semadeni, & Canella, 2014). Cooperation from other decision makers is essential for fully formulating and implementing strategic decisions that CEOs want. CEOs with more power can obtain support from other top executives and board of directors more easily, and convince them to follow their choices.

First, I argue that CEO power strengthens the influence of inventor CEOs on strategic change. Inventor CEOs who are divergent thinkers and intrinsically motivated by novel and creative tasks would tend to have the ability and motivation to sense and seize opportunities for change, and reconfigure resources to implement strategic changes (Forsgren, 1990; Frosch et al., 2015; Giuri et al., 2007; Helfat & Peteraf, 2015; Martinsen & Diseth, 2011). When these inventor CEOs have more power, they can receive more

cooperation from other decision makers, resulting in less resistance and more support about developing new strategies and making resource realignments for strategic change (Eisenstat et al., 1990; Tang et al., 2011). Inventor CEOs' effort to sense and seize change opportunities and reconfigure resources to pursue changes based on divergent thinking and intrinsic motivation can receive more support from the organization, making strategic change easier for inventor CEOs. This is especially important for strategic change, since pursuing strategies that are different from the past naturally entails risks and generates resistance (Eisenstat et al., 1990; Oreg, 2003). Pursuing changes also requires redistribution and investment of resources and support from the organization. Inventor CEOs with more power can overcome this resistance more easily and can gain support from other decision makers to pursue strategic changes that they want. Thus, I suggest that CEO power will strengthen the effect that inventor CEOs have on strategic change.

Hypothesis 4 (H4): The greater an inventor CEO's power, the stronger the positive effect of a CEO's inventor background on strategic change.

Second, I argue that CEO power strengthens the influence of inventor CEOs on strategic distinctiveness. Inventor CEOs tend to be divergent thinkers, and they have the abilities to develop uncommon and original strategies that are different from strategies of other firms in the industry (Amabile, 1988; Benedek et al., 2012; Frosch et al., 2015; Runco & Acar, 2012). They are also likely to be intrinsically motivated by creative and novel tasks, which makes them more engaged in and committed to pursuing distinctive strategies (Forsgren, 1990; Giuri et al., 2007; Owan & Nagoka, 2011; Rossman, 1931).

Inventor CEOs have the ability and motivation to pursue distinctive strategies, but when they have more power in the firm, they can better pursue their choice of strategies. For CEOs to fully implement their decisions about pursuing distinctive strategies, they need to acquire support from other decision makers including top executives and board of directors (Tang et al., 2011; Zhu & Chen, 2015). Pursuing strategies that are different from other firms entails costs and risks, and is likely to generate doubts and resistance (Deephouse, 1999; DiMaggio & Powell, 1983; Lieberman & Asaba, 2006). When inventor CEOs have lower level of power within the firm, they are less likely to receive support from the organization and more likely to face resistance in pursuing distinctive strategies. Inventor CEOs with more power can better cope with resistance and make resource allocations that reflect distinctive strategies more easily. Thus, I suggest that CEO power will strengthen the relationship between inventor CEOs and strategic distinctiveness.

Hypothesis 5 (H5): The greater an inventor CEO's power, the stronger the positive effect of a CEO's inventor background on strategic distinctiveness.

Third, I argue that CEO power strengthens the effect that inventor CEOs have on stakeholder management. Inventors CEOs tend to be divergent thinkers and intrinsically motivated individuals who enjoy pursuing complex and challenging tasks (Amabile, 1988; Amabile & Pratt, 2016; Benedek et al., 2012; Gino & Ariely, 2012; Owan & Nagaoka, 2011; Runco, 2010). Inventor CEOs have the ability and motivation to identify and process interests of diverse stakeholders and implement strategies that cater to the demands of stakeholders. However, inventor CEOs' ability and motivation to implement

stakeholder management are likely to be limited by the amount of power they have. CEOs are not the sole decision maker of firms' strategies and their latitude of actions are affected by opinions of other decision makers that have power over the firm (Pearce & Zahra, 1991; Zhu & Chen, 2015). If CEOs want to fully implement their strategic decisions, they need to gain support from other top executives and board of directors. This is especially likely to be the case when pursuing strategies like stakeholder management, which requires resource allocations and has the potential to evoke resistance. Decision makers who believe in a view that focuses more on shareholders are likely to disagree with strategies that make resource allocations to meet the demands of diverse stakeholders (Danielson et al., 2008; Friedman, 1970; Levitt, 1958). Some decision makers may not have the same positive view towards stakeholder management, or they may not agree about the boundary of the stakeholders that the firm needs to tend to. Inventor CEOs who have lower level of power are likely to face difficulties in making decisions to pursue stakeholder management. Disagreements about the scope of stakeholders and amount of resource allocations for stakeholders will hinder inventor CEOs' ability and motivation to pursue stakeholder management. Inventor CEOs with higher level of power can gather more support from other decision makers and reach an agreement about resource allocation to pursue stakeholder management. Thus, I suggest that CEO power will strengthen the effect of inventor CEOs on stakeholder management.

> *Hypothesis 6 (H6): The greater an inventor CEO's power, the stronger the positive effect of a CEO's inventor background on stakeholder management.*

Moderating Effect of Firms' Slack Resources

George (2005: p. 661) defined slack resources as "potentially utilizable resources that can be diverted or redeployed for the achievement of organizational goals." More slack means that the firm can afford the costs related to pursuing uncertainties, exploration, and adaptation within the firm (Bourgeois 1981; Rosner, 1968). With higher level of slack resources, there would be less need for competition or conflict about resource allocation within the firm since there are more room for supporting multiple activities (Bourgeois, 1981; Cyert & March, 1963). Decisions that entail uncertainties that would not gain support in other situations can be approved if the firm has enough slack resources.

First, I argue that the level of firms' slack resources positively affects the relationship between inventor CEOs and strategic change. Inventor CEOs have the ability and motivation to pursue strategic change, but when their firms have more slack resources, other decision makers will have more favorable reactions and less resistance to inventor CEOs' decision to pursue strategic changes because they can afford uncertainties and exploration. Inventor CEOs' decision to pursue strategic changes and reallocate resources to pursue changes will face less competition and resistance due to abundance of resources that can be utilized for change. This also means that inventor CEOs will have more resources at hand that they can utilize to pursue and support strategic changes. Since the firm has more extra resources that can be utilized, CEOs have more freedom and flexibility in pursuing strategic changes that they want to pursue (George, 2005; Sharfman, Wolf, Chase, & Tansik, 1988). However, in firms with less

slack resources, inventor CEOs will face fierce competition for resources, and will have to pursue more efficient and safer strategies. Lack of resources that can be utilized for strategic change makes it harder for inventor CEOs to implement strategic changes. In general, lack of slack resources makes it difficult for inventor CEOs to initiate and implement strategies that they want to pursue. Thus, I suggest that the amount of firms' slack resources will strengthen the effect of inventor CEOs on strategic change.

Hypothesis 7 (H7): The greater the amount of slack resources, the stronger the positive effect of a CEO's inventor background on strategic change.

Second, I argue that having more firm level slack resources strengthens the influence of inventor CEOs on strategic distinctiveness. Inventor CEOs tend to be divergent thinkers and intrinsically motivated by creative and novel tasks (Amabile, 1988; Benedek et al., 2012; Frosch et al., 2015; Runco & Acar, 2012). They have the ability and motivation to pursue strategies that are different from average strategies of other firms in the industry, but when their firms have more extra resources at hand that they can potentially utilize, inventor CEOs can better pursue distinctive strategies. Pursuing distinctive strategies incurs costs and risks and can be a burden for the firm, generating resistance from other decision makers (Deephouse, 1999; DiMaggio & Powell, 1983; Lieberman & Asaba, 2006). When a firm has lower level of slack resources, potential threats that can arise from pursuing distinctive strategies are considered more seriously among decision makers and resistance to inventor CEOs' decision to pursue such strategies can be strong. On the other hand, when a firm has a higher level of slack resources, pursuing more uncertain, explorative strategies can be

tolerated, due to access to extra resources at hand that can be utilized (Bourgeois, 1981; Rosner, 1968). Inventor CEOs will face less concern and resistance about their decision to pursue distinctive strategies and have more flexibility in choosing their strategies (George, 2005; Sharfman et al., 1988). Furthermore, slack resources can be potentially utilized for implementing distinctive strategies. When inventor CEOs require more resources to fully implement the strategies, access to slack resources can help them secure resources that can support them to realize their decisions. Thus, I suggest that inventor CEOs with access to higher level of firms' slack resources will be able to better pursue distinctive strategies.

Hypothesis 8 (H8): The greater the amount of slack resources, the stronger the positive effect of a CEO's inventor background on strategic distinctiveness.

Third, I argue that the amount of slack resources positively affects the relationship between inventor CEOs and stakeholder management. As an individual, inventor CEOs have the ability and motivation to pursue strategies that consider a broader set of stakeholders. However, when faced with low level of slack resources, inventor CEOs are likely to face more difficulties in pursuing such strategies. Stakeholder management requires allocation of resources to meet the needs of diverse stakeholders, and this can be perceived as a threat to shareholders and decision makers who believe that firms' responsibilities should be focused towards shareholders (Danielson et al., 2008; Freidman, 1970; Levitt, 1958). Decision makers and stakeholders may have different opinions about the scope of stakeholders and amount of resources that should be allocated to stakeholder management. Firms that have a lower level of slack resources

will need to redistribute resources from other functions to invest resources in stakeholder management, which will evoke resistance. Inventor CEOs of firms with low level of slack resources are likely to have difficulties in persuading other decision makers that allocating resources to stakeholder management will not be a major threat, since there is a limited amount of slack resources that can act as a buffer in case of emergency. However, inventor CEOs of firms with higher level of slack resources may utilize certain portion of these resources for stakeholder management, which can lower resistance from those who do not have a favorable view toward stakeholder management. Having a high level of slack resources can also help inventor CEOs argue that the firm is already investing enough resources for essential activities and shareholders, and that they can further invest in other stakeholders. Having a higher level of slack resources reduces competition and conflict about allocation of resources, and inventor CEOs can pursue more activities, including those that cater to the demands of multiple stakeholders (Bourgeois, 1981; Cyert & March, 1963). Thus, I suggest that the level of firms' slack resources will strengthen the positive influence of inventor CEOs on stakeholder management.

Hypothesis 9 (H9): The greater the amount of slack resources, the stronger the positive effect of a CEO's inventor background on stakeholder management.

Moderating Effect of Industry Dynamism

Industry dynamism refers to "the magnitude of change in a firm's industry and market conditions" (Larrañeta, Zahra, & Galán González, 2014: p. 762). A dynamic industry is characterized by instability, turbulence, and low predictability (Haleblian & Finkelstein, 1993; Larrañeta, et al., 2014). Frequent changes and less predictability in a

dynamic industry make previously set paradigms easily obsolete, and focusing only on one set direction can be dangerous (Henderson, Miller, & Hambrick, 2006). Thus, inventor CEOs who have the ability and motivation to pursue strategic change can better pursue strategic changes when the industry is more dynamic. A turbulent environment means that there are increased amount of diverse information that can be utilized to sense opportunities for change, and more number of new opportunities for change (Haleblian & Finkelstein, 1993). In a more dynamic industry, inventor CEOs who are divergent thinkers can more easily get access to diverse information required for sensing opportunities, and they can seize multiple opportunities for change. Furthermore, inventor CEOs who want to pursue strategic change due to their intrinsic motivation in novel and creative strategies will have more need to make strategic changes, since set strategies easily become obsolete in a dynamic industry. Also, they can better persuade others to support their decisions to make changes, based on the need for change coming from the environmental situations. Thus, I hypothesize that the level of industry dynamism will strengthen the effect of inventor CEOs on strategic change.

Hypothesis 10 (H10): The more dynamic the industry, the stronger the positive effect of a CEO's inventor background on strategic change.

I also argue that a dynamic industry condition strengthens the influence of inventor CEOs on strategic distinctiveness. Inventor CEOs have the ability and motivation to pursue strategies that are unique and different from the industry standard (Amabile, 1988; Benedek et al., 2012; Frosch et al., 2015; Runco & Acar, 2012). An industry with a higher level of dynamism provides opportunities for inventor CEOs to

actively pursue distinctive strategies. In a more dynamic industry, the environment surrounding the firm is more instable, turbulent, and difficult to predict, decreasing the effectiveness of existing standards and paradigms (Haleblian & Finkelstein, 1993; Henderson et al., 2006; Larrañeta, et al., 2014). These characteristics of a dynamic industry works in favor of inventor CEOs who are looking for more chances and reasons that can support their enthusiasm about pursuing strategies that are different from the norm. A higher level of dynamism constantly stirs up the effectiveness of existing strategies that are widely used by other firms, and low predictability makes it difficult for decision makers to confidently argue that strategies used by other firms will lead to success. Increased level of chaos in a dynamic industry makes it difficult for decision makers to choose the one right strategy that will work as the best strategy, and managers are faced with more freedom to choose a strategy. In this type of an industry situation, inventor CEOs who have the ability and motivation to pursue distinctive strategies will have more chances to pursue those strategies. Pursuing distinctive strategies can often run into resistance from other decision makers, because such strategies are different from safer options that many other firms are using (Deephouse, 1999; DiMaggio & Powell, 1983; Lieberman & Asaba, 2006). However, in a more dynamic industry, outcomes of standard strategies become less certain, and inventor CEOs have more reasons to argue for taking distinctive strategies. Thus, I argue that the level of industry dynamism will positively affect the relationship between inventor CEOs and strategic distinctiveness.

> *Hypothesis 11 (H11): The more dynamic the industry, the stronger the positive effect of a CEO's inventor background on strategic distinctiveness.*

Lastly, I argue that inventor CEOs in a more dynamic industry are more likely to implement stakeholder management compared to those in a less dynamic industry. Firms in a more dynamic industry are burdened with processing increased amount of information from an instable, turbulent, and difficult to predict environment (Haleblian & Finkelstein, 1993; Henderson et al., 2006; Larrañeta, et al., 2014). These characteristics of a dynamic industry overload the information processing ability of firms. Accordingly, pursuing stakeholder management in a dynamic industry can be difficult for firms due to the increase in the amount and complexity of information they need to process. Stakeholder management itself is a complex process that requires firms to recognize, process, and coordinate diverse information from multiple stakeholders (Gröschl et al., 2019; Hahn et al., 2014; Rupp et al., 2013; Sharma & Henriques, 2005; Yang et al., 2019). Managers need to be able to process diverse and often conflicting interests of multiple stakeholders, change organizational procedures accordingly, and negotiate transactions to deliver values to stakeholders (Freeman, 1984; Hart & Sharma, 2004; Jiang et al., 2020; Wickham & Wong, 2009; Zakhem, 2008). These processes all require capability of managers to process massive amount of information. When faced with more information load in a dynamic industry, effectively pursuing stakeholder management can be a burden for CEOs. Non-inventor CEOs who tend to have lower level of divergent thinking ability face difficulties in processing a large amount of complex information coming from both the dynamic industry and stakeholder management, and thus will have difficulties in pursuing stakeholder management. Furthermore, since they are not intrinsically motivated to pursue stakeholder management, inventor CEOs are less likely to strongly pursue stakeholder management in such a complex and overwhelming

situation. On the other hand, inventor CEOs tend to be less affected by information overload caused by industry dynamism because they are capable of processing diverse information based on their divergent thinking. They are also more committed to pursuing stakeholder management due to their intrinsic motivation, and difficulties coming from dynamic industry situation are less likely to make them reduce focus on stakeholder management. Thus, I argue that industry dynamism will have a positive influence on the relationship between inventor CEOs and stakeholder management.

Hypothesis 12 (H12): The more dynamic the industry, the stronger the positive effect of a CEO's inventor background on stakeholder management.

CHAPTER 4

METHODS

Data and Sample

The initial sample of this study includes all firms in technology-intensive industries in the Execucomp database between 1996 and 2017. I chose this time frame due to data availability constraints. Data from ISS (Institutional Shareholder Services) are available from 1996. For models using stakeholder management as a dependent variable, the timeframe is between 1996 and 2012 because MSCI acquired KLD (Kinder, Lydenburg, Domini) in 2014 and the sample ends in 2013. I use a lagged design and all dependent variables are measured at time t+1, which is why the final year is 2012. Following previous studies, I focus on firms in technology-intensive industries because most of the patents are generated in those industries and majority of inventor CEOs work in those industries (Hagedoorn & Duysters, 2002; Zaheer, Hernandez, & Banerjee, 2010). I include firms in the following industry sectors: (1) drugs and medicines (SIC 2833-2836), (2) computers and office equipment (SIC 3571-3579), (3) electrical equipment (SIC 3612-3652), communications equipment (SIC 3661-3669), aerospace and aircraft (SIC 3721, 3724, 3728, 3761, 3764, 3769), measuring, photo equipment, and clocks (SIC 3821-3899), computer programming, data processing, etc. (SIC 737), engineering services (SIC 8711), and R&D and testing services (SIC 873).

As described below, I measure CEOs' inventor background using information on patents that they hold. Data on inventors and their patents are collected from the PatentsView database, which provides organized information on patents. The

PatentsView database is a collaboration between US Patent & Trademark Office (USPTO) and other research institutions, and utilizes patent data from USPTO to provide information on inventors' patenting activities and a unique identifier for inventors. Other information are obtained from a number of sources, including Compustat, Execucomp, BoardEx, MSCI ESG KLD, ISS, Global Corporate Patent Dataset (GCPD), and Thomson Reuters. The final sample for models using strategic change as the dependent variable consists of 4,658 observations with 952 CEOs. 19.3 percent of CEOs are inventor CEOs and 18.9 percent of firm-years have inventor CEOs in this sample. The final sample for models using strategic distinctiveness as the dependent variable consists of 4,737 observations with 959 CEOs. 19.1 percent of CEOs are inventor CEOs and 18.6 percent of firm-years have inventor CEOs in this sample. The final sample for models using stakeholder management as the dependent variable consists of 2,620 observations with 586 CEOs. In this sample, 20.8 percent of CEOs are inventor CEOs and 18.4 percent of firm-years have inventor CEOs.

Dependent Variables

I utilize a lagged design, and all dependent variables are measured at time t+1 because decisions made by CEOs take time to be implemented and shown in numbers. Following previous studies, I measure *strategic change* and *strategic distinctiveness* based on six dimensions (Bednar et al., 2013; Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997): (1) advertising intensity (advertising expense/sales), (2) inventory level (inventories/sales), (3) plant and equipment newness (net plant and equipment/gross plant and equipment), (4) R&D intensity (R&D expense/sales), (5) non-

production overhead (selling, general, and administrative expense/sales), and (6) financial leverage (total debt/equity). These six resource dimensions are used to capture strategic change and strategic distinctiveness because they have profound impacts on firms' performance, reflect important aspects of a firm's strategy, can be compared between firms, and are controllable by CEOs (Finkelstein & Hambrick, 1990). I follow previous studies to create a composite measure of strategic change and strategic distinctiveness that includes these six dimensions (Bednar et al., 2013; Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997; Wowak, Mannor, Arrfelt, & McNamara, 2016). To calculate strategic change, I first calculate the year-on-year absolute difference along each dimension, and standardize them by industry and year. I use the sum of the standardized value of the yearly differences of six dimensions as the composite measure that captures strategic change. For strategic distinctiveness, I calculate the absolute difference between the average of other firms in the same industry and a firm in each year, along each of the six dimensions. I standardize these indicators by industry and year, and the sum of the standardized scores is the composite measure of strategic distinctiveness.

Following previous studies, I generate a measure of *stakeholder management* as a performance outcome using the KLD index (Gamache et al., 2020; Hillman & Keim, 2001). KLD index evaluates firms across many domains of social performance, utilizing diverse sources of information. To create a measure of stakeholder management, I utilize ratings for primary stakeholder categories including community, diversity, employee relations, environment, and human rights. These categories capture the relations with important primary stakeholders of a firm. I exclude the product characteristics category

because they are more directly related to economic value compared to other categories (Gamache et al., 2020; Husted, Jamali, & Saffar, 2016). I first create a sum of total strengths of a firm across the five primary stakeholder categories, and subtract the average number of strengths for all firms in a given year. By adjusting the sum of total strength by mean of strengths for all firms, I can account for trends across samples and changes in factors and firms included in the KLD index (Gamache et al., 2020; Ioannou & Serafeim, 2015). KLD index provides ratings on both strengths and concerns for their categories, but I create a stakeholder management measure based on strengths measures because my theory argues for engagement in positive stakeholder management, and not about harming stakeholder relationships. Previous studies also utilized the same approach and suggest that merging strengths and concerns can be problematic since they capture two different and conflicting mechanisms (Gamache et al., 2020; Ioannou & Serafeim, 2015).

Independent Variables

Background as an *inventor CEO* is measured based on patents that a CEO generated before. I use the PatentsView database[1], Execucomp, and BoardEx to identify inventor CEOs. The PatentsView database provides information about inventors and their patenting activities, including names of the inventors, patent identifier, assignee identifier, filed dates, and grant dates. This database includes information from the USPTO on patenting activities since 1976. It allows researchers to collect information about the patenting activities of inventors. I use the individuals' names, assignee names, and filed dates from the PatentsView database to match inventors to the employment

[1] www.patentsview.org

history of CEOs obtained from the Execucomp and BoardEx database. If the name of the inventor, names of the assignees of the patents, and the years that patents were filed from the PatentsView inventor database match the name of the CEO, names of the employers of the CEO, and the employment years from the Execucomp and BoardEx database, I identify the CEO as the inventor stated on the PatentsView database. I use a binary measure to capture an inventor CEO. A binary measure of an inventor CEO is a dummy variable, with 1 representing a CEO with a patent, and 0 representing a CEO without a patent. Only the firm-years after the grant year of the inventor CEO's first patent are assigned a value of 1.

I generate a *CEO power* index based on four indicators that are widely used in the literature to capture CEO power (Finkelstein, 1992; Finkelstein et al., 2009; Krause et al., 2014). I use the sum of the standardized scores of CEO duality, CEO tenure in the focal firm, CEO ownership, and proportion of inside directors to generate a CEO power index. CEO duality is a binary variable with 1 representing a CEO who is also a board chair in the same year and 0 otherwise. CEO tenure is calculated as the number of years a CEO worked as a CEO of the focal company. CEO ownership is measured as the percentage of common shares owned by the CEO. Proportion of inside directors is the number of inside directors divided by board size. Following previous studies, the level of firms' *slack* resources is captured using cash and cash equivalents (Kim & Bettis, 2014; Vanacker et al., 2017). To measure *industry dynamism*, I regress the sum of industry sales against year between year t and year t-4, and the standard error of the regression coefficient is used to capture industry dynamism (Keats & Hitt, 1988; Kim & Ployhart, 2018). A larger

standard error of the regression coefficient means that industry sales are more unstable and dynamic over time.

Control Variables

I include multiple control variables related to CEOs, firms, and industries. At the CEO-level, I control for entrepreneur status, STEM (science, technology, engineering, and mathematics) degree earned, highest degree earned (Ph.D., maser's, bachelor's, or others), age, gender, incentive compensation, outsider status, number of different industries the CEO worked in, and total years of work experience because they can affect CEOs' strategic decisions (Barker & Mueller, 2002; Borghesi, Houston, & Naranjo, 2014; Carpenter, 2000; Finkelstein & Hambrick , 1990; Manner, 2010; Zhang & Rajagopalan, 2010). I control for the *CEO STEM degree earned*, operationalized as a binary variable set to 1 if the CEO has received education in engineering, technology, mathematics, or applied science related fields and 0 otherwise.[2] I also control for *CEO highest degree earned* (PhD., master's, bachelor's, or others) because it can influence CEOs' decisions (Barker & Mueller, 2002). I include *CEO age* as a control variable because it can affect CEOs' strategic decisions (McClelland et al., 2010; Serfling, 2014). I control for CEO gender as a binary variable set to 1 if the CEO is a male and 0 otherwise (*CEO is male*), because gender can affect decision makers' influence on firms

[2] BoardEx provides information on all types of degrees received by CEOs, but it is not inclusive enough to capture specific degrees that the CEOs received for many CEOs. My measure of CEOs' STEM degree only confirms CEOs' degrees related to engineering, technology, mathematics, or applied science related fields, but may not capture it accurately because many CEOs' major is not reported in the database. In my final sample for firms' strategic change, I was able to identify the specific major of the degree for 538 out of 952 CEOs. Among the 538 CEOs, 76 have a STEM degree, and 86 are inventor CEOs. Further analysis on these CEOs shows that 30.2 percent of inventor CEOs have a STEM degree. Among non-inventor CEOs, about 11 percent have a STEM degree.

(Adams & Funk, 2012; Ho, Li, Tam, & Zhang, 2015). I measure *CEO incentive compensation* as total compensation minus salary and bonus, divided by total compensation (Crossland et al., 2014). I control for CEO's outsider status measured as a binary variable set to 1 if the CEO was appointed from outside the firm and 0 otherwise (*CEO is an outsider*). Work experience in diverse industries is measured as the number of different industries the CEO had worked in (*CEO number of industries worked in*). I also include *CEO total years of work experience* as a control variable.

I measure the CEO's entrepreneur status as a binary variable set to 1 if the CEO has founded a firm in his/her career and 0 otherwise (*Entrepreneur CEO*). It is important to control for the entrepreneur status of CEOs because these CEOs can have attributes that can affect strategic choices. Existing studies suggest that founder or entrepreneur CEOs tend to have higher levels of need for achievement, tolerance for ambiguity, overconfidence, and risk-taking propensity compared to peers (Begley, 1995; Begley & Boyd, 1987; Busenitz & Barney, 1997; Lee, Hwang, & Chen, 2017; Stewart, Watson, Carland, & Carland, 1999). These studies about founder and entrepreneur CEOs do not suggest that they have identical attributes compared to inventor CEOs, including divergent thinking and intrinsic motivation for novel, creative and challenging tasks. However, these CEOs do possess attributes that can lead to abilities to better pursue novel and complex tasks, influencing firms' strategic decisions.

I control for *firm age* (years since initial public offering), *firm performance* (ROA), *firm size* (logarithm of the number of employees), *institutional ownership*, and *firm number of patents* (number of patents granted to the firm in a given year) as firm-

level control variables (Crossland et al., 2014; Rajagopalan & Spreitzer, 1997; Triana et al., 2014; Udayasankar, 2008; Westphal & Bednar, 2005). Institutional ownership is measured as the proportion of outstanding shares held by the largest institutional block holder. To measure the number of patents granted to a firm in a given year, I collected firms' patent data from GCPD (Bena, Ferreira, Matos, & Pires, 2017). GCPD data is provided by the University of Virginia Darden School of Business and provides data on patents of publicly listed firms, using data from USPTO. I also include the value of the dependent variable in the previous year as a control variable. At the industry level, I control for *industry munificence* because firms in a more munificent industry can make different strategic decisions compared to other firms. The regression coefficient obtained by regressing industry sales against year from year t-4 to year t is the measure for industry munificence (Keats & Hitt, 1988). Year dummies are included in all models.

Analytical Models

I use firm fixed effects regression with Dirscoll-Kraay robust standard errors to analyze the data, using the xtscc command in Stata (Deutsch et al., 2011; Hoechle, 2007). This model with Driscoll-Kraay standard errors is robust in terms of heteroscedasticity, autocorrelation, and cross-sectional dependence. Results from Breusch-Pagan/Cook-Weisberg test and Wooldridge test suggest the presence of heteroscedasticity and autocorrelation, and Hausman test result suggests the use of firm fixed-effects model. Thus, the regression model that I use for the analysis of this sample is appropriate. For all primary models, all variables included in the model has a VIF level below 5 and multicollinearity is not an issue in this model.

CHAPTER 5

RESULTS

Primary Analysis

Table 1, 2, and 3 show descriptive statistics and correlations of variables included in the models for strategic change, strategic distinctiveness, and stakeholder management, respectively. Table 4, 5, and 6 report results of the fixed effect panel regression with Driscoll-Kraay robust standard errors analysis of strategic change, strategic distinctiveness, and stakeholder management, respectively. 2-tailed tests are used in all analyses. Model 1 in Table 4, 5, and 6 includes only the control variables. Model 2 adds inventor CEO background as an independent variable. Model 3 adds the interaction between inventor CEO background and CEO power. Model 4 adds the interaction between inventor CEO background and firm's slack resources. Model 5 is the full model that further adds the interaction between inventor CEO background and industry dynamism. I report and discuss the analysis results based on the complete model in Model 5 of each table.

Hypothesis 1 predicts that firms managed by CEOs with an inventor background will show a higher level of strategic change, compared to firms with non-inventor CEOs. Results from Model 5 of Table 4 show that the coefficient of CEOs' inventor background is positive (β = 0.379) and significant (p = 0.018), providing support for Hypothesis 1. Compared to non-inventor CEOs, inventor CEOs are associated with an increase in strategic change by about 15 percent of one standard deviation. Hypothesis 4 predicts that the positive relationship between CEOs' inventor background and strategic change in

Hypothesis 1 will be stronger for CEOs with more power. Results from Model 5 of Table 4 provide support for Hypothesis 4. The interaction between inventor CEOs and CEO power is positive (β = 0.077) and significant at p = 0.072. Holding other moderators at their means and other variables constant, an increase in CEO power from one standard deviation below the mean to one standard deviation above the mean will increase the positive effect of inventor CEOs on strategic change by 176 percent. Results from Model 5 of Table 4 show that the coefficient of the interaction between CEOs' inventor background and slack resources is positive (β = 0.016) and significant (p = 0.067). This provides support for Hypothesis 7 and suggests that the level of firm's slack resources strengthens the positive relationship between inventor CEO background and firm's strategic change. Holding other moderators at their means and other variables constant, an increase in slack resources from one standard deviation below the mean to one standard deviation above the mean will increase the positive effect of inventor CEOs on strategic change by 65.1 percent. Results from Model 5 of Table 4 show that the interaction between inventor CEO background and industry dynamism is positive (β = 0.004) and close to being significant (p = 0.119). Thus, Hypothesis 10, which is about the moderating effect of industry dynamism, is only supported when using a one-tailed test and not supported when using a two-tailed test. Figures 1, 2, and 3 further illustrate the moderating effects of CEO power, firm's slack resources, and industry dynamism. The figures depict the impact of inventor CEO background on strategic change when the values of the moderators change from one standard deviation below the mean to one standard deviation above the mean.

Results in Table 5 show analysis related to firm's strategic distinctiveness. The results in Model 5 show that the coefficients for the predictor and interactions are not significant. Thus, Hypothesis 2, Hypothesis 5, Hypothesis 8, and Hypothesis 11 are not supported, and the influence of inventor CEO background on strategic distinctiveness is not supported. Results in Table 6 show analysis about the influence of inventor CEO background on firm's stakeholder management. The results do not support the hypothesized relationships about the influence of inventor CEO background on stakeholder management. The results in Model 5 of Table 6 show that the interaction between inventor CEO background and CEO power is positive (β = 0.078) and significant (p = 0.098), but the main effect of inventor CEO background on stakeholder management and other interactions are not significant. Thus, Hypothesis 3, Hypothesis 6, Hypothesis 9, and Hypothesis 12 are not supported.

Robustness Tests and Supplemental Analysis

To evaluate the robustness of the findings from the primary analysis, I conduct multiple robustness analyses and supplemental analyses. I conduct a coarsened exact matching (CEM) analysis as a robustness test (Blackwell, Iacus, King, & Porro, 2009; Iacus, King, & Porro, 2012). Since my measure for inventor CEOs is a binary measure, I match observations in my sample using inventor background as the treatment. I identify matched observations between firm-years with inventor CEOs and non-inventor CEOs based on similarity in terms of firm performance, firm size, and industry affiliation. After the matching process, I use the same method that I use in the primary analysis to analyze the hypothesized relationships on the combined matched sample of inventor CEOs and

non-inventor CEOs. Table A1, A2, and A3 in the appendix show the results of the CEM analyses on strategic change, strategic distinctiveness, and stakeholder management, respectively. Model 5 of Table A1 shows that hypotheses about strategic change receive strong support for the main effect and all moderating effects. The coefficient of inventor CEO background is positive (β = 0.484) and significant (p = 0.014), providing support for Hypothesis 1. The coefficient for the interaction between inventor CEO background and CEO power is also positive (β = 0.114) and significant (p = 0.045), providing support for Hypothesis 4. The coefficient for the interaction between inventor CEO background and firm slack resource is positive (β = 0.016) and significant (p = 0.020), providing support for Hypothesis 7. The moderating effect of industry dynamism receive support in this analysis, and the coefficient is positive (β = 0.004) and significant (p = 0.074). The moderating effect of industry dynamism is only significant using the one-tailed test in the primary analysis, but the CEM model provides strong support for this relationship. As can be seen in Table A2 and A3, I did not find support for hypotheses related to strategic distinctiveness and stakeholder management, which is consistent with the results from the primary analysis.

I also test the robustness of my finding on different set of samples. In the primary analysis, I focus on technology-intensive industries based on existing studies (Hagedoorn & Duysters, 2002; Zaheer et al., 2010). As a robustness test, I generate different set of technology-intensive industries based on another study that selected different set of industries (Loughran & Ritter, 2004). I include the following industry sectors for the robustness test: (1) computer hardware (SIC 3571, 3572, 3575, 3577, 3578), (2)

communications equipment (SIC 3661, 3663, 3669), (3) measuring and controlling devices (SIC 3823, 3825, 3826, 3827, 3829), (4) medical instruments (SIC 3841, 3845), (5) telephone equipment (SIC 4812, 4813), (6) communication services (SIC 4899), and (7) software (7371, 7372, 7373, 7374, 7375, 7378, 7379). I use the same analytical model and variables from the primary analyses, and test the hypothesized relationships on this new sample. Table A4, A5, and A6 in the appendix report results for strategic change, strategic distinctiveness, and stakeholder management, respectively. The results from this new set of technology-intensive industries show consistent findings for all hypotheses related to strategic change and stakeholder management. Thus, the impact of inventor CEOs on strategic change is further supported. An interesting finding is that the coefficient for the main effect of inventor CEO background on strategic distinctiveness in Model 5 of Table A5 is negative (β = -0.286) and significant (p = 0.065). This result shows the possibility that inventor CEOs with divergent thinking capabilities may be able to consider multiple alternative strategies, and based on their analysis of diverse strategies, choose conformity or optimal distinctiveness with more focus on conformity as their final solution (Deephouse, 1999). I explain more about this interpretation in the next chapter.

Furthermore, as a robustness test to the primary measures of strategic change, strategic distinctiveness, and stakeholder management, I generate different versions of these variables and check the results from analyses using new measures. For the main measure of strategic change and strategic distinctiveness, I follow previous studies and replace missing values of R&D expense and advertising expense with zeros (Deb, David, & O'Brien, 2017; Dezső, Ross, & Uribe, 2016; Haynes & Hillman, 2010). As a

robustness test, I measure strategic change and strategic distinctiveness by replacing missing values of the six dimensions used to generate the measure with industry average values. Additionally, I also generate an alternative measure by not replacing missing values at all. The results from analyses using these alternative measures of strategic change and strategic distinctiveness provide largely consistent results with the results from the primary analysis, providing additional support for the influence of inventor CEOs on firms' strategic change. Following previous studies, I exclude the product characteristics category when creating a primary measure for stakeholder management (Gamache et al., 2020; Husted et al., 2016). As a robustness check, I include the "Products" category to generate a measure for stakeholder management, and found consistent results showing no support for the influence of inventor CEO background on stakeholder management.

I also test alternative models with different control variables. Since there is a possibility that inventor CEOs lose some of their attributes when they don't engage in inventive activities for a long period of time, I include the years since the CEO was granted the last patent as a control variable, and found consistent results for all hypotheses related to strategic change, strategic distinctiveness, and stakeholder management. In the primary analyses, I include previous year's dependent variable at time t as a control variable. However, the correlation between the dependent variable (t+1) and previous year's dependent variable (t) for stakeholder management and strategic distinctiveness shows high level of correlation at 0.9 and 0.81. Thus, I analyze the hypothesized relationships excluding the previous year's dependent variable from the

list of control variables as a robustness test. Results of this robustness analyses show largely consistent results for all hypotheses.

The primary model that I use considers heteroscedasticity and spatial and temporal autocorrelation, and is adequate for analyzing my sample. However, I also check the results using other models to analyze the hypothesized relationships. For all hypotheses, I use the feasible generalized least squares (FGLS) regression with heteroscedasticity and panel-specific AR1 autocorrelation, fixed effects panel regression with robust standard errors, and random effects panel regression with Driscoll-Kraay robust standard errors as robustness tests using alternative methods. I find consistent support for the positive impact of inventor CEO background on strategic change, but the alternative methods do not provide support the hypotheses related to strategic distinctiveness and stakeholder management.

Although my theory does not make any arguments about the corporate governance issues, I also test the influence of inventor CEOs on this category as a supplemental analysis. Corporate governance category in the KLD index is related to agency problems between managers and shareholders, and is less relevant to stakeholder management (Gamache et al., 2020; Husted et al., 2016). I use the total number of a firm's strengths in the KLD's corporate governance category, and subtract the mean number of strengths of all firms in that year (Gamache et al., 2020; Ioannous & Serafeim, 2015). However, I do not find support for the influence of inventor CEO background on firm's corporate governance.

CHAPTER 6

DISCUSSION

Strategic management researchers have given much attention to how CEOs affect firms' major strategic decisions including strategic change, strategic distinctiveness, and stakeholder management (Crossland et al., 2014; Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997; Shropshire & Hillman, 2007). While extant studies have examined diverse attributes of CEOs as determinants of firms' strategic decisions, little systematic research has been conducted to study the impacts of CEOs' diverse professional backgrounds on important strategic decisions (Barker & Mueller, 2002; Benmelech & Frydman, 2015; Crossland et al., 2014; Carpenter et al., 2001; Daily et al., 2000; Le & Kroll, 2017). In this study, I examine the influence of an important type of professional background of CEOs, their background as an inventor, on major strategic decisions including strategic change, strategic distinctiveness, and stakeholder management. Building on studies about inventors and strategic leadership, I develop theoretical arguments to explain that inventor CEOs tend to be divergent thinkers and intrinsically motivated individuals. I proposed that inventor CEOs with these unique attributes pursue more changes and distinctiveness in their strategies, and effective stakeholder management. Furthermore, I proposed that CEO power, firm's slack resources, and industry dynamism will strengthen the effect of inventor CEOs on firms' strategic change, strategic distinctiveness, and stakeholder management. Utilizing data about the patenting activities of inventors, I empirically tested my theoretical arguments.

Findings from this research provide support for my predictions about the impact of inventor CEOs on strategic change. Analyses results from my primary analysis and robustness tests all suggest that firms with inventor CEOs tend to pursue more strategic change, compared to firms with non-inventor CEOs. Inventor CEOs who tend to be divergent thinkers have abilities to sense and seize opportunities for change, and reconfigure and transform resources to effectively make changes. Inventor CEOs are also likely to be intrinsically motivated by novel and creative tasks, and have the motivation to seek strategic change. Furthermore, the results also show that CEO power, firm's slack resources, and industry dynamism strengthen the influence of inventor CEOs on strategic change. Overall, the findings from my analyses provide support for my theoretical prediction that a CEO's background as an inventor is an important professional background that explains the changes in firms' strategies.

Although I built my arguments based on evidence from existing studies about inventors and firms' strategic decisions, I did not find support for the influence of inventor CEOs on firms' strategic distinctiveness and stakeholder management. I could not empirically test why my arguments did not receive support, but there are possible interpretations that may provide some explanations for the results of my analyses. One possibility is that some of the inventor CEOs choose to pursue less distinctive strategies based on their interpretation of the situation. Inventor CEOs who can consider multiple information and alternatives might reach a conclusion that pursuing optimal distinctiveness is a better choice for them, rather than pursuing distinctive strategies that entail risks. Existing studies on strategic distinctiveness suggest that following the norm is a safer choice and uniqueness is helpful only after you have enough legitimacy

(Deephouse, 1999). After analyzing multiple information and alternatives based on their abilities, some of the inventor CEOs may have decided that pursuing an optimal level of distinctiveness, or even lower level of distinctiveness, would be beneficial for themselves. Rather than increasing strategic distinctiveness, settling with an adequate amount of differentiation would satisfy inventor CEOs intrinsic motivation while minimizing risks. While making strategic changes can help the firm adapt to constantly changing environmental situations, pursuing strategic distinctiveness may be seen by inventor CEOs as riskier since deviating from industry norms entails more risks. Considering that some of the results from robustness tests show negative and significant influence of inventor CEOs on strategic distinctiveness, this explanation can be one possibility that is driving the findings in my analysis.

Another possible interpretation is that decisions related to strategic changes might be capturing more attention of inventor CEOs compared to decisions related to strategic distinctiveness, since strategic changes require more constant changes to the decisions. Making strategic changes is about updating resource allocations every year, and would require more novel and original decisions compared to strategic distinctiveness. Strategic distinctiveness is about deviating from the average strategies of firms in the industry, which is not likely to show large amount of annual changes. The norms of the industry will not change dramatically every year, and novelty and originality related to pursuing strategic distinctiveness are likely to be lower compared to making strategic changes. Thus, inventor CEOs who are intrinsically motivated by novel, original, and challenging tasks may be attracted more by decisions related to strategic change than strategic

distinctiveness, which could be why my arguments for strategic change received support but arguments about strategic distinctiveness did not receive any support.

For stakeholder management, none of the results from the primary and robustness analyses showed significant relationships. Although it is difficult to tell why the hypothesized relationships did not receive any support, one possibility is that decisions related to catering to diverse demands of multiple stakeholders might not be novel and challenging enough to intrinsically motivate inventor CEOs. Making strategic changes are more directly related to making novel, original, and challenging decisions, but engaging in stakeholder management might have less relevance to what inventor CEOs are looking for. Another possibility is that inventor CEOs are only focused on stakeholders that they are interested in. They may choose to invest in certain stakeholder groups that they find interesting, rather than catering to the demands of multiple stakeholders.

Theoretical Implications

This study contributes to strategic leadership research. I identify an inventor CEO as a unique and important type of CEO that has influences on firms' strategies. While previous studies have examined the influence of diverse aspects of CEOs (Finkelstein et al, 2009), little systematic research has given attention to the professional background of CEOs as inventors. Despite evidence suggesting a large presence of inventor CEOs and their importance in the business world (Bostan & Mian, 2019; Islam & Zein, 2020), management scholars have not yet examined how inventor CEOs can affect firms' strategic decisions. By identifying a CEO's professional background as an inventor as an

important but unstudied characteristic of a CEO that can explain firms' decisions to pursue changes in strategies, this study suggests future opportunities to further examine the impacts of inventor CEOs on major strategic outcomes.

My theoretical arguments and findings also make important contributions to strategic management research. This study provides a novel perspective in understanding changes in strategic decisions of firms by identifying CEOs' inventor background as an important but unstudied determinant of firms' strategic changes. Extant studies suggest that pursuing strategic change is an important decision for firms' survival, and scholars have tried to identify determinants of firms' strategic changes (Ginsberg, 1988; Rajagopalan & Spreitzer, 1997). However, only a small number of studies have examined the influence of CEO's professional backgrounds on firms' strategic changes, despite evidence suggesting that professional backgrounds can have a significant influence on CEOs' decisions (Barker & Mueller, 2002; Crossland et al., 2014; Dittmar & Duchin, 2016; Hambrick & Mason, 1984). My arguments and findings in this study provide support for the impact of CEO's inventor background on firms' strategic changes. By explaining how CEOs' background as an inventor is one of the sources of firms' strategic changes, this study enhances our understanding about when and why firms pursue changes in their strategies.

Arguments and findings of this study about the moderating effect of CEO power, firm's slack resources, and industry dynamism further extend our contributions above. Specifically, the results of this study suggest that inventor CEOs are more likely to pursue changes in strategies when they have greater power in the firm, have access to

higher levels of slack resources, and are in a more dynamic industry. Inventor CEOs in general tend to be divergent thinkers and intrinsically motivated individuals who have the ability and motivation to pursue strategic changes, but when they have more power, have more slack resources that they can utilize, and face more instable and dynamic environmental conditions, they are especially likely to pursue and implement strategic changes. These moderators are important boundary conditions at the CEO, firm, and industry level that enhance our understanding about the influence of inventor CEOs on firms' strategic changes.

Practical Implications

This study also has important practical implications. By explaining the influence of inventor CEOs on their strategic decisions, this study provides valuable insights for stakeholders to better understand CEOs and their decisions. For example, investors and analysts who are looking for firms that pursue changes in strategies can focus on firms that are run by inventor CEOs. Board of directors that wish to increase firms' strategic change can consider hiring inventor CEOs. Employees can better predict the strategies of their employers by checking if their CEOs hold patents or not. CEOs can prepare their strategies against their competing firms by predicting changes in strategies from CEOs with inventor backgrounds.

Limitations and Future Research

This study examines the influence of inventor CEOs on an important strategic decision, and there are limitations that are also opportunities for future studies to extend

this research. I made theoretical predictions building on existing studies about inventors and their divergent thinking abilities and intrinsic motivation, but the nature of my data did not allow me to directly capture the underlying microprocesses of inventor CEOs' decision making processes. Future research can try to directly capture this link by using survey data on CEOs or content analysis utilizing CEO's writings or speech.

Endogeneity can be a potential issue. Although I tried to reduce endogeneity concerns by using a lagged design, including multiple control variables, and utilizing firm fixed effects and CEM models, there would still be potential issues. There can be two interpretations of the analysis results. It could be that inventor CEOs are pursuing strategic changes due to their attributes, but another interpretation is that firms that are looking for certain attributes are hiring inventor CEOs. Both interpretations would suggest that inventor CEOs have unique attributes that can result in more strategic changes, and this would be a contribution since I identify that inventor CEOs possess attributes that can be linked to strategic changes. Future studies may use instrumental variables to further reduce the endogeneity concern.

Also, although the primary analysis and robustness tests in this study provide support for the influence of inventor CEOs on strategic change, I did not find evidence for the influence on other strategic decision, including strategic distinctiveness and stakeholder management. However, studies on inventors and their attributes and findings from this study suggest that a CEO's background as an inventor has a potential to influence important strategic decisions. Future studies can expand this research and conduct more in depth research about inventor CEOs and their impact on other major

strategic and performance outcomes. The phenomenon of inventor CEOs has not been studied in depth, and there is limited information about these unique CEOs. There are many questions that need to be answered in order for us to better understand this important type of CEOs. Why do some inventors start their own firm based on their inventions while others become inventor CEOs? Why are some inventor CEOs able to constantly produce patents while other inventor CEOs stop after becoming a CEO? Research into these more fundamental questions would require interviews or surveys of inventor CEOs, which I could not conduct in this study. While this study focused on the influence of inventor CEOs on their firms' strategic decisions, future studies can conduct more detailed qualitative study about the phenomenon of inventor CEOs. Furthermore, future studies can examine the influence of inventor CEOs on other important strategic decisions. For example, inventor CEOs may be able to capture valuable opportunities in foreign markets and successfully expand into other countries due to their divergent thinking and intrinsic motivation. In a similar vein, firms run by inventor CEOs may also excel at product diversifications. Considering that inventor CEOs have large presence in the business world and their unique attributes can be linked to diverse strategic decisions and organizational outcomes, extending this research to examine how inventor CEOs influence other major types of strategic decisions seems to be a promising direction for future research.

TABLES

Table 1. Descriptive statistics and correlation coefficients (strategic change)[a]

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Strategic change (t+1)	-0.48	2.53									
2. Inventor CEO	0.19	0.39	0.08								
3. CEO power	0.05	2.33	-0.03	0.27							
4. Slack	1.63	6.22	-0.05	0.06	-0.04						
5. Industry dynamism	31.89	24.73	0.00	0.02	-0.01	0.13					
6. Entrepreneur CEO	0.23	0.42	0.08	0.35	0.50	-0.03	0.08				
7. CEO STEM degree earned	0.07	0.25	0.03	0.09	-0.01	-0.03	0.04	0.10			
8. CEO highest degree earned	1.86	0.77	0.00	0.10	0.00	0.00	0.00	0.04	0.19		
9. CEO age	0.55	0.07	-0.07	0.03	0.31	0.01	-0.05	0.11	-0.08	0.03	
10. CEO is male	0.98	0.13	-0.04	0.03	0.05	0.00	-0.03	-0.02	0.02	0.00	0.02
11. CEO incentive compensation	0.69	0.26	-0.03	-0.06	-0.22	0.05	0.10	-0.15	0.03	0.01	-0.08
12. CEO is an outsider	0.22	0.42	0.02	0.10	0.24	-0.05	0.04	0.19	0.07	0.05	0.07
13. CEO number of industries worked in	1.92	1.11	-0.05	-0.12	-0.13	0.12	0.02	-0.17	-0.02	-0.01	0.13
14. CEO total years of work experience	27.33	7.99	-0.08	0.07	0.27	0.09	0.02	0.07	-0.07	0.01	0.66
15. Firm age	22.98	16.09	-0.17	-0.08	-0.12	0.16	-0.09	-0.29	-0.08	0.01	0.18
16. Firm performance	0.04	0.20	-0.29	0.02	0.04	0.07	-0.05	-0.04	-0.01	-0.02	0.06
17. Firm size	1.84	1.21	-0.24	-0.13	-0.09	0.40	-0.01	-0.16	-0.10	-0.04	0.08
18. Institutional ownership	0.09	0.04	0.00	0.03	-0.03	-0.15	0.04	0.04	0.02	-0.04	-0.01
19. Firm number of patents	0.97	4.03	-0.03	0.04	-0.04	0.44	0.05	-0.05	0.01	-0.05	0.01
20. Strategic change (t)	-0.48	2.51	0.52	0.07	-0.03	-0.05	-0.01	0.07	0.03	0.00	-0.08
21. Industry munificence	10.54	9.78	-0.01	-0.02	0.09	0.05	0.10	0.14	0.02	-0.07	-0.10

Variable	10	11	12	13	14	15	16	17	18	19	20
11. CEO incentive compensation	0.00										
12. CEO is an outsider	0.00	-0.13									
13. CEO number of industries worked in	-0.10	0.09	-0.03								
14. CEO total years of work experience	0.00	-0.03	0.10	0.23							
15. Firm age	0.01	0.11	-0.14	0.16	0.23						
16. Firm performance	0.01	0.06	-0.07	0.00	0.08	0.09					
17. Firm size	0.00	0.21	-0.13	0.28	0.20	0.50	0.13				
18. Institutional ownership	-0.06	0.03	-0.03	-0.08	0.00	-0.09	0.05	-0.29			
19. Firm number of patents	-0.14	0.07	-0.02	0.11	0.10	0.22	0.06	0.43	-0.15		
20. Strategic change (t)	-0.06	-0.05	0.04	-0.04	-0.07	-0.16	-0.30	-0.23	0.01	-0.04	
21. Industry munificence	-0.02	0.04	0.05	-0.04	-0.06	-0.17	0.03	0.01	-0.02	0.06	-0.01

a. N = 4,658. Variables were rescaled to allow proper reporting. Slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively.

Table 2. Descriptive statistics and correlation coefficients (strategic distinctiveness)[a]

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Strategic distinctiveness (t+1)	-0.55	2.43									
2. Inventor CEO	0.19	0.39	0.02								
3. CEO power	0.05	2.33	0.04	0.26							
4. Slack	1.63	6.28	-0.05	0.07	-0.03						
5. Industry dynamism	32.04	24.62	-0.01	0.02	-0.01	0.13					
6. Entrepreneur CEO	0.23	0.42	0.06	0.35	0.50	-0.02	0.07				
7. CEO STEM degree earned	0.07	0.25	-0.02	0.09	-0.01	-0.03	0.04	0.10			
8. CEO highest degree earned	1.85	0.78	0.02	0.11	-0.01	-0.01	-0.01	0.04	0.19		
9. CEO age	0.55	0.07	0.00	0.03	0.31	0.00	-0.05	0.10	-0.08	0.03	
10. CEO is male	0.98	0.13	-0.03	0.03	0.05	0.00	-0.03	-0.02	0.02	0.00	0.02
11. CEO incentive compensation	0.69	0.27	-0.08	-0.06	-0.22	0.04	0.09	-0.15	0.03	0.01	-0.08
12. CEO is an outsider	0.22	0.42	0.01	0.10	0.23	-0.04	0.04	0.19	0.07	0.05	0.07
13. CEO number of industries worked in	1.91	1.11	-0.07	-0.11	-0.13	0.11	0.02	-0.16	-0.02	0.00	0.13
14. CEO total years of work experience	27.21	8.03	-0.02	0.07	0.27	0.08	0.02	0.07	-0.07	0.01	0.66
15. Firm age	22.73	16.04	-0.11	-0.08	-0.11	0.16	-0.09	-0.29	-0.08	0.01	0.18
16. Firm performance	0.04	0.20	-0.20	0.02	0.04	0.07	-0.06	-0.05	-0.01	-0.02	0.06
17. Firm size	1.83	1.21	-0.10	-0.12	-0.08	0.40	-0.01	-0.16	-0.10	-0.05	0.09
18. Institutional ownership	0.09	0.04	-0.02	0.03	-0.03	-0.15	0.05	0.04	0.03	-0.03	-0.01
19. Firm number of patents	0.96	4.02	-0.02	0.04	-0.04	0.45	0.05	-0.05	0.01	-0.05	0.01
20. Strategic distinctiveness (t)	-0.56	2.44	0.81	0.02	0.04	-0.05	-0.01	0.06	-0.02	0.01	-0.01
21. Industry munificence	10.73	9.85	0.00	-0.02	0.09	0.05	0.09	0.14	0.02	-0.07	-0.10

Variable	10	11	12	13	14	15	16	17	18	19	20
11. CEO incentive compensation	0.00										
12. CEO is an outsider	0.00	-0.13									
13. CEO number of industries worked in	-0.10	0.09	-0.03								
14. CEO total years of work experience	0.00	-0.03	0.09	0.24							
15. Firm age	0.01	0.11	-0.14	0.16	0.23						
16. Firm performance	0.01	0.06	-0.07	0.00	0.07	0.09					
17. Firm size	0.00	0.21	-0.13	0.28	0.20	0.50	0.14				
18. Institutional ownership	-0.06	0.03	-0.04	-0.08	0.01	-0.09	0.05	-0.29			
19. Firm number of patents	-0.14	0.06	-0.02	0.11	0.10	0.22	0.06	0.43	-0.15		
20. Strategic distinctiveness (t)	-0.05	-0.08	0.00	-0.06	-0.02	-0.10	-0.24	-0.09	-0.02	-0.02	
21. Industry munificence	-0.02	0.04	0.05	-0.04	-0.06	-0.17	0.03	0.00	-0.02	0.06	-0.01

a. N = 4,737. Variables were rescaled to allow proper reporting. Slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively.

Table 3. Descriptive statistics and correlation coefficients (stakeholder management)[a]

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Stakeholder management (t+1)	0.86	3.01									
2. Inventor CEO	0.18	0.39	-0.01								
3. CEO power	0.17	2.37	-0.12	0.25							
4. Slack	1.45	4.48	0.55	0.09	-0.02						
5. Industry dynamism	32.96	24.71	0.13	0.06	-0.01	0.16					
6. Entrepreneur CEO	0.22	0.41	-0.13	0.35	0.49	-0.01	0.11				
7. CEO STEM degree earned	0.05	0.22	-0.01	0.09	-0.03	-0.03	0.06	0.10			
8. CEO highest degree earned	1.85	0.79	0.01	0.12	0.01	-0.02	0.03	0.08	0.15		
9. CEO age	0.55	0.07	0.03	0.01	0.34	0.04	-0.07	0.11	-0.10	0.03	
10. CEO is male	0.98	0.13	-0.08	0.02	0.04	0.01	-0.06	-0.06	0.03	-0.01	0.02
11. CEO incentive compensation	0.68	0.25	0.18	-0.06	-0.19	0.02	0.10	-0.12	0.05	0.02	-0.10
12. CEO is an outsider	0.24	0.43	-0.08	0.11	0.22	-0.06	0.07	0.23	0.10	0.06	0.12
13. CEO number of industries worked in	1.92	1.09	0.23	-0.09	-0.09	0.20	0.00	-0.16	0.02	-0.03	0.15
14. CEO total years of work experience	27.38	8.01	0.15	0.04	0.30	0.13	0.01	0.08	-0.08	0.03	0.68
15. Firm age	22.85	16.11	0.33	-0.07	-0.10	0.19	-0.09	-0.28	-0.07	0.01	0.18
16. Firm performance	0.05	0.13	0.11	0.00	0.09	0.11	-0.03	-0.05	-0.01	-0.04	0.06
17. Firm size	1.96	1.25	0.56	-0.12	-0.07	0.43	-0.06	-0.19	-0.08	-0.04	0.11
18. Institutional ownership	0.09	0.04	-0.21	0.00	-0.05	-0.24	0.01	0.09	0.02	0.00	-0.04
19. Firm number of patents	0.98	3.79	0.55	0.02	-0.02	0.49	0.08	-0.05	0.03	-0.07	0.04
20. Stakeholder management (t)	0.77	2.91	0.90	0.00	-0.12	0.55	0.13	-0.13	-0.01	0.01	0.04
21. Industry munificence	9.67	8.75	0.05	0.00	0.08	0.07	-0.02	0.10	0.03	-0.08	-0.08

Variable	10	11	12	13	14	15	16	17	18	19	20
11. CEO incentive compensation	-0.01										
12. CEO is an outsider	-0.06	-0.09									
13. CEO number of industries worked in	-0.10	0.07	-0.01								
14. CEO total years of work experience	0.03	-0.06	0.12	0.24							
15. Firm age	0.07	0.06	-0.14	0.14	0.21						
16. Firm performance	0.02	0.00	-0.05	0.04	0.11	0.07					
17. Firm size	0.06	0.14	-0.15	0.30	0.23	0.52	0.12				
18. Institutional ownership	-0.11	-0.01	-0.01	-0.11	-0.07	-0.13	-0.06	-0.33			
19. Firm number of patents	-0.03	0.05	-0.02	0.17	0.13	0.22	0.07	0.44	-0.20		
20. Stakeholder management (t)	-0.09	0.18	-0.08	0.23	0.16	0.34	0.10	0.54	-0.18	0.55	
21. Industry munificence	-0.04	0.09	0.08	-0.01	-0.02	-0.11	0.07	0.01	-0.03	0.10	0.05

a. N = 2,620. Variables were rescaled to allow proper reporting. Slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively.

Table 4. Fixed effects panel regression using Driscoll-Kraay robust standard errors on strategic change[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			0.415	(0.014)	0.411	(0.014)	0.368	(0.023)	0.379	(0.018)
Inventor CEO × CEO power					0.071	(0.108)	0.073	(0.090)	0.077	(0.072)
Inventor CEO × slack							0.017	(0.053)	0.016	(0.067)
Inventor CEO × industry dynamism									0.004	(0.119)
CEO power	-0.045	(0.080)	-0.050	(0.051)	-0.063	(0.026)	-0.065	(0.025)	-0.065	(0.026)
Slack	-0.001	(0.830)	0.000	(0.918)	-0.000	(0.983)	0.001	(0.825)	0.001	(0.728)
Industry dynamism	-0.002	(0.065)	-0.002	(0.089)	-0.002	(0.095)	-0.002	(0.124)	-0.002	(0.101)
Entrepreneur CEO	0.026	(0.817)	-0.047	(0.638)	-0.048	(0.644)	-0.028	(0.787)	-0.028	(0.785)
CEO STEM degree earned	0.055	(0.743)	0.028	(0.862)	0.028	(0.863)	0.015	(0.927)	0.020	(0.901)
CEO highest degree earned	-0.098	(0.056)	-0.116	(0.035)	-0.120	(0.025)	-0.116	(0.033)	-0.114	(0.035)
CEO age	-0.084	(0.922)	-0.013	(0.987)	0.017	(0.983)	0.032	(0.969)	0.004	(0.997)
CEO is male	0.170	(0.508)	0.114	(0.680)	0.145	(0.598)	0.142	(0.599)	0.149	(0.591)
CEO incentive compensation	0.131	(0.529)	0.146	(0.479)	0.146	(0.478)	0.155	(0.457)	0.156	(0.455)
CEO is an outsider	-0.211	(0.153)	-0.195	(0.185)	-0.179	(0.232)	-0.174	(0.241)	-0.178	(0.226)
CEO number of industries worked in	-0.019	(0.476)	-0.015	(0.550)	-0.013	(0.597)	-0.015	(0.559)	-0.014	(0.578)
CEO total years of work experience	0.003	(0.745)	0.002	(0.852)	0.002	(0.843)	0.002	(0.832)	0.002	(0.799)
Firm age	0.061	(0.070)	0.061	(0.070)	0.060	(0.083)	0.060	(0.081)	0.060	(0.079)
Firm performance	-1.523	(0.000)	-1.514	(0.000)	-1.515	(0.000)	-1.515	(0.000)	-1.521	(0.000)
Firm size	-0.421	(0.000)	-0.428	(0.000)	-0.431	(0.000)	-0.436	(0.000)	-0.439	(0.000)
Institutional ownership	0.387	(0.753)	0.479	(0.699)	0.498	(0.686)	0.469	(0.705)	0.482	(0.698)
Firm number of patents	0.005	(0.560)	0.004	(0.612)	0.006	(0.475)	0.004	(0.664)	0.004	(0.620)
Strategic change (t)	0.110	(0.000)	0.108	(0.000)	0.108	(0.000)	0.108	(0.000)	0.107	(0.000)
Industry munificence	-0.003	(0.515)	-0.003	(0.609)	-0.003	(0.586)	-0.002	(0.602)	-0.003	(0.603)
Constant	-1.533	(0.199)	-1.475	(0.219)	-1.508	(0.215)	-1.529	(0.210)	-1.550	(0.207)
R-squared	0.5090		0.5099		0.5101		0.5103		0.5105	

a. N = 4,658. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively.

Table 5. Fixed effects panel regression using Driscoll-Kraay robust standard errors on strategic distinctiveness[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			-0.107	(0.278)	-0.107	(0.281)	-0.114	(0.266)	-0.107	(0.281)
Inventor CEO × CEO power					0.004	(0.894)	0.004	(0.884)	0.006	(0.843)
Inventor CEO × slack							0.003	(0.579)	0.002	(0.681)
Inventor CEO × industry dynamism									0.002	(0.475)
CEO power	0.017	(0.334)	0.018	(0.301)	0.017	(0.330)	0.017	(0.345)	0.017	(0.333)
Slack	0.009	(0.022)	0.009	(0.027)	0.009	(0.033)	0.009	(0.044)	0.009	(0.037)
Industry dynamism	-0.003	(0.101)	-0.003	(0.097)	-0.003	(0.095)	-0.003	(0.099)	-0.003	(0.098)
Entrepreneur CEO	-0.056	(0.639)	-0.037	(0.743)	-0.037	(0.742)	-0.034	(0.760)	-0.033	(0.764)
CEO STEM degree earned	-0.079	(0.603)	-0.071	(0.634)	-0.071	(0.635)	-0.073	(0.625)	-0.070	(0.639)
CEO highest degree earned	0.023	(0.456)	0.028	(0.364)	0.028	(0.363)	0.029	(0.347)	0.029	(0.342)
CEO age	-0.161	(0.786)	-0.184	(0.761)	-0.183	(0.761)	-0.181	(0.765)	-0.196	(0.750)
CEO is male	-0.195	(0.302)	-0.181	(0.339)	-0.179	(0.332)	-0.179	(0.329)	-0.176	(0.343)
CEO incentive compensation	-0.147	(0.069)	-0.151	(0.063)	-0.151	(0.064)	-0.150	(0.067)	-0.149	(0.073)
CEO is an outsider	0.138	(0.112)	0.133	(0.123)	0.134	(0.124)	0.135	(0.120)	0.133	(0.131)
CEO number of industries worked in	-0.043	(0.067)	-0.044	(0.059)	-0.044	(0.060)	-0.044	(0.056)	-0.044	(0.060)
CEO total years of work experience	0.001	(0.806)	0.002	(0.761)	0.002	(0.760)	0.002	(0.757)	0.002	(0.741)
Firm age	0.051	(0.003)	0.051	(0.003)	0.051	(0.003)	0.051	(0.003)	0.051	(0.003)
Firm performance	-0.108	(0.302)	-0.111	(0.295)	-0.111	(0.296)	-0.110	(0.297)	-0.114	(0.285)
Firm size	-0.322	(0.000)	-0.321	(0.000)	-0.321	(0.000)	-0.322	(0.000)	-0.323	(0.000)
Institutional ownership	-0.707	(0.220)	-0.731	(0.211)	-0.730	(0.210)	-0.735	(0.210)	-0.730	(0.213)
Firm number of patents	-0.021	(0.008)	-0.021	(0.008)	-0.020	(0.009)	-0.021	(0.010)	-0.020	(0.011)
Strategic distinctiveness (t)	0.470	(0.000)	0.470	(0.000)	0.470	(0.000)	0.470	(0.000)	0.470	(0.000)
Industry munificence	0.002	(0.696)	0.001	(0.729)	0.001	(0.730)	0.002	(0.727)	0.001	(0.738)
Constant	-0.055	(0.895)	-0.082	(0.847)	-0.082	(0.844)	-0.085	(0.840)	-0.089	(0.834)
R-squared	0.7456		0.7457		0.7457		0.7457		0.7458	

a. N = 4,737. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively

Table 6. Fixed effects panel regression using Driscoll-Kraay robust standard errors on stakeholder management[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			0.051	(0.644)	0.041	(0.715)	-0.000	(1.000)	-0.000	(0.999)
Inventor CEO × CEO power					0.085	(0.109)	0.078	(0.107)	0.078	(0.098)
Inventor CEO × slack							0.044	(0.206)	0.045	(0.253)
Inventor CEO × industry dynamism									-0.001	(0.905)
CEO power	-0.025	(0.295)	-0.026	(0.300)	-0.040	(0.171)	-0.044	(0.145)	-0.044	(0.144)
Slack	0.019	(0.022)	0.019	(0.022)	0.019	(0.034)	0.008	(0.509)	0.007	(0.557)
Industry dynamism	0.003	(0.272)	0.003	(0.270)	0.003	(0.205)	0.004	(0.134)	0.004	(0.126)
Entrepreneur CEO	0.113	(0.393)	0.102	(0.461)	0.098	(0.469)	0.169	(0.144)	0.170	(0.146)
CEO STEM degree earned	0.117	(0.728)	0.118	(0.726)	0.074	(0.809)	0.049	(0.867)	0.049	(0.867)
CEO highest degree earned	0.086	(0.298)	0.081	(0.277)	0.085	(0.263)	0.084	(0.270)	0.083	(0.285)
CEO age	-0.852	(0.054)	-0.838	(0.060)	-0.836	(0.043)	-0.941	(0.032)	-0.932	(0.040)
CEO is male	0.542	(0.041)	0.535	(0.042)	0.566	(0.039)	0.586	(0.035)	0.587	(0.037)
CEO incentive compensation	0.123	(0.184)	0.122	(0.185)	0.119	(0.197)	0.118	(0.209)	0.117	(0.204)
CEO is an outsider	0.000	(0.999)	0.003	(0.982)	0.029	(0.814)	0.044	(0.730)	0.044	(0.727)
CEO number of industries worked in	0.050	(0.312)	0.049	(0.318)	0.049	(0.328)	0.050	(0.323)	0.050	(0.315)
CEO total years of work experience	0.007	(0.270)	0.007	(0.273)	0.008	(0.200)	0.008	(0.174)	0.008	(0.184)
Firm age	0.093	(0.000)	0.092	(0.000)	0.090	(0.000)	0.092	(0.000)	0.092	(0.000)
Firm performance	0.092	(0.468)	0.095	(0.446)	0.110	(0.392)	0.125	(0.363)	0.127	(0.396)
Firm size	0.355	(0.144)	0.356	(0.145)	0.346	(0.147)	0.347	(0.139)	0.346	(0.135)
Institutional ownership	-1.990	(0.007)	-1.972	(0.006)	-1.939	(0.007)	-1.975	(0.007)	-1.980	(0.008)
Firm number of patents	0.049	(0.014)	0.049	(0.014)	0.049	(0.013)	0.047	(0.018)	0.047	(0.017)
Stakeholder management (t)	0.564	(0.000)	0.563	(0.000)	0.564	(0.000)	0.565	(0.000)	0.565	(0.000)
Industry munificence	0.001	(0.682)	0.001	(0.664)	0.001	(0.685)	0.002	(0.495)	0.002	(0.496)
Constant	-3.127	(0.009)	-3.111	(0.009)	-3.110	(0.009)	-3.160	(0.010)	-3.160	(0.010)
R-squared	0.8740		0.8740		0.8742		0.8746		0.8746	

a. N = 2,620. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively.

FIGURES

Figure 1. Moderating effect of CEO power

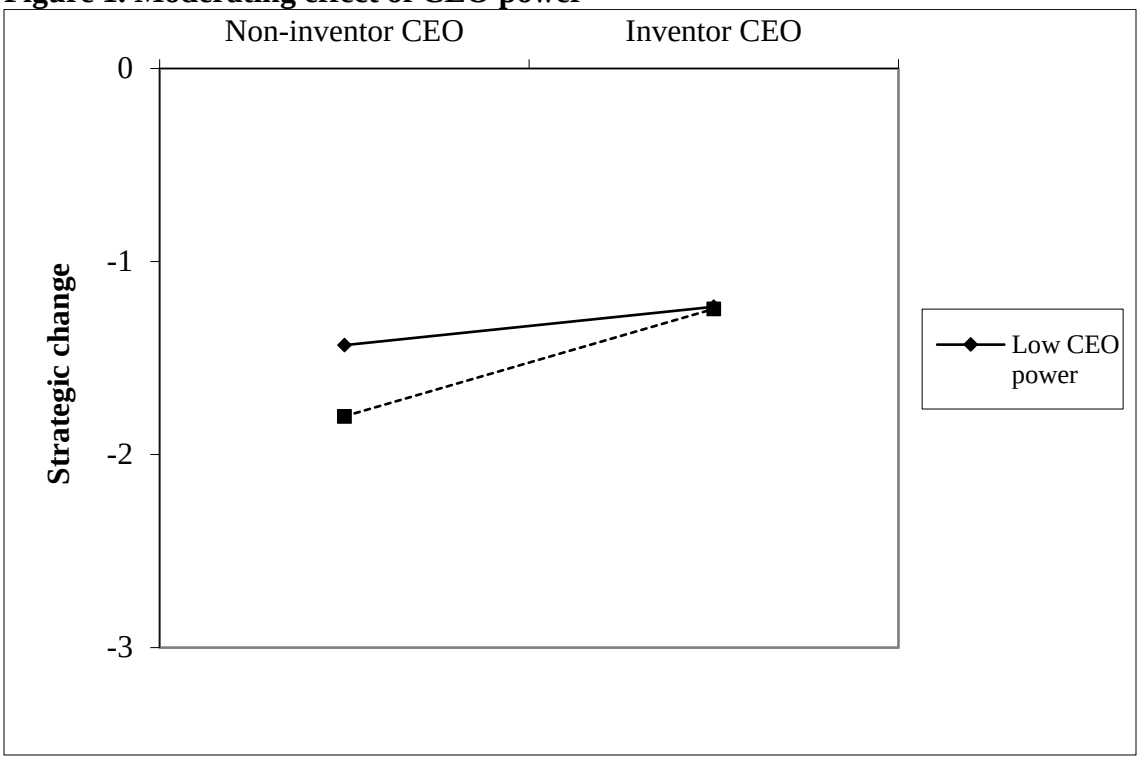


Figure 2. Moderating effect of slack resources

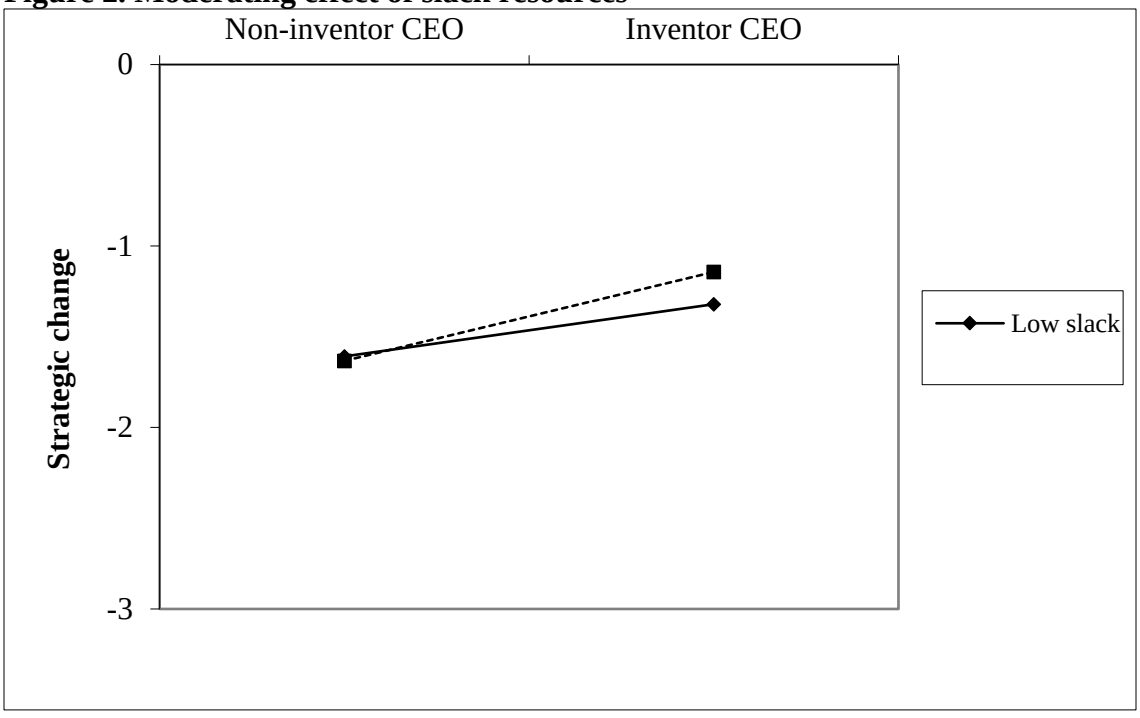
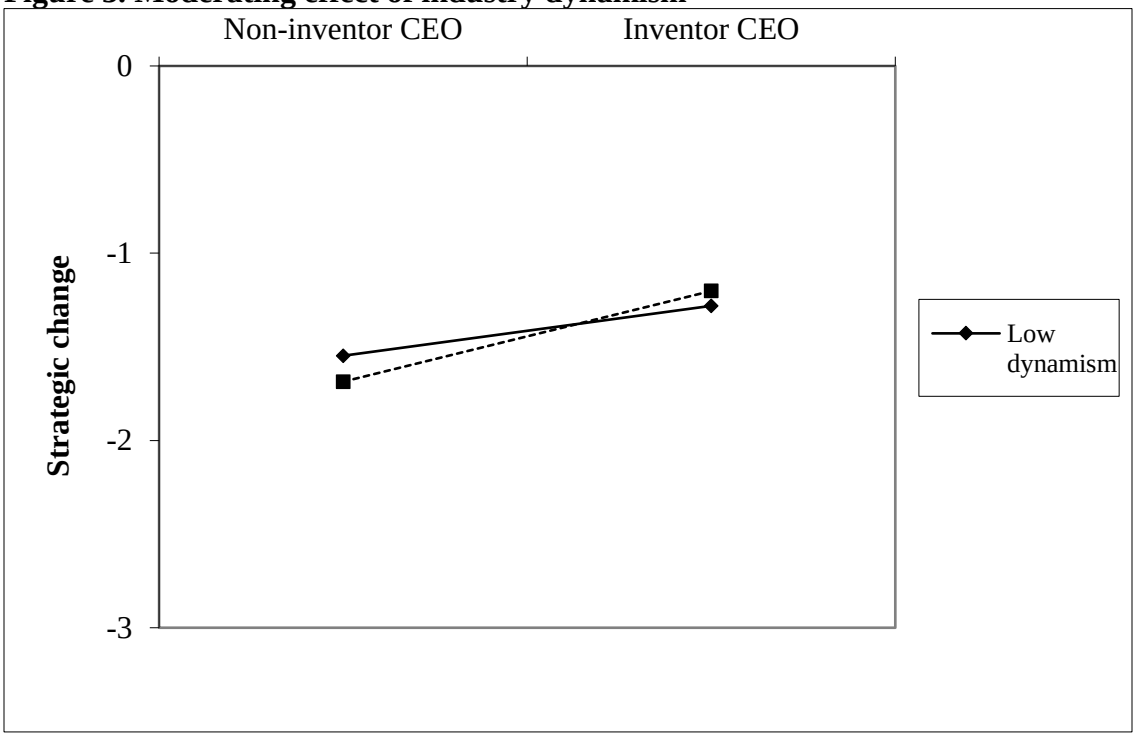


Figure 3. Moderating effect of industry dynamism



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APPENDIX A

ROBUSTNESS TEST RESULTS

Table A1. CEM models on strategic change[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			0.530	(0.010)	0.524	(0.009)	0.483	(0.015)	0.484	(0.014)
Inventor CEO × CEO power					0.104	(0.071)	0.108	(0.056)	0.114	(0.045)
Inventor CEO × slack							0.017	(0.015)	0.016	(0.020)
Inventor CEO × industry dynamism									0.004	(0.074)
CEO power	-0.024	(0.563)	-0.032	(0.442)	-0.055	(0.257)	-0.058	(0.232)	-0.059	(0.230)
Slack	-0.012	(0.082)	-0.009	(0.177)	-0.010	(0.132)	-0.009	(0.120)	-0.009	(0.133)
Industry dynamism	-0.001	(0.546)	-0.001	(0.639)	-0.001	(0.680)	-0.001	(0.743)	-0.001	(0.605)
Entrepreneur CEO	0.132	(0.324)	0.030	(0.835)	0.028	(0.849)	0.050	(0.726)	0.054	(0.699)
CEO STEM degree earned	-0.052	(0.805)	-0.094	(0.656)	-0.083	(0.683)	-0.087	(0.676)	-0.090	(0.669)
CEO highest degree earned	-0.262	(0.000)	-0.306	(0.001)	-0.308	(0.000)	-0.302	(0.000)	-0.299	(0.000)
CEO age	-0.711	(0.538)	-0.739	(0.517)	-0.647	(0.559)	-0.625	(0.572)	-0.651	(0.559)
CEO is male	0.761	(0.094)	0.637	(0.216)	0.726	(0.159)	0.755	(0.142)	0.760	(0.142)
CEO incentive compensation	0.169	(0.498)	0.205	(0.398)	0.216	(0.364)	0.225	(0.350)	0.225	(0.349)
CEO is an outsider	-0.353	(0.087)	-0.312	(0.125)	-0.288	(0.172)	-0.284	(0.172)	-0.288	(0.164)
CEO number of industries worked in	0.010	(0.850)	0.018	(0.709)	0.019	(0.705)	0.020	(0.681)	0.021	(0.670)
CEO total years of work experience	-0.003	(0.818)	-0.004	(0.736)	-0.005	(0.698)	-0.004	(0.707)	-0.004	(0.736)
Firm age	0.058	(0.053)	0.058	(0.053)	0.056	(0.066)	0.057	(0.064)	0.057	(0.063)
Firm performance	-1.875	(0.009)	-1.861	(0.009)	-1.823	(0.009)	-1.812	(0.009)	-1.821	(0.008)
Firm size	-0.504	(0.002)	-0.516	(0.002)	-0.512	(0.002)	-0.514	(0.002)	-0.521	(0.002)
Institutional ownership	0.991	(0.422)	1.138	(0.373)	1.244	(0.323)	1.239	(0.323)	1.269	(0.316)
Firm number of patents	0.011	(0.570)	0.012	(0.554)	0.016	(0.419)	0.010	(0.650)	0.011	(0.607)
Strategic change (t)	0.070	(0.009)	0.067	(0.012)	0.066	(0.013)	0.066	(0.013)	0.065	(0.014)
Industry munificence	0.001	(0.919)	0.001	(0.886)	0.001	(0.930)	0.001	(0.905)	0.001	(0.892)
Constant	-1.162	(0.318)	-0.967	(0.424)	-1.120	(0.351)	-1.208	(0.314)	-1.228	(0.311)
R-squared	0.4969		0.4985		0.4991		0.4993		0.4995	

a. N = 3,889. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively.

Table A2. CEM models on strategic distinctiveness[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			-0.118	(0.265)	-0.118	(0.269)	-0.125	(0.245)	-0.125	(0.242)
Inventor CEO × CEO power					0.002	(0.961)	0.003	(0.948)	0.005	(0.908)
Inventor CEO × slack							0.003	(0.617)	0.003	(0.682)
Inventor CEO × industry dynamism									0.002	(0.592)
CEO power	0.023	(0.418)	0.024	(0.384)	0.024	(0.456)	0.023	(0.473)	0.023	(0.479)
Slack	0.013	(0.003)	0.012	(0.006)	0.012	(0.009)	0.012	(0.017)	0.012	(0.016)
Industry dynamism	0.000	(0.848)	0.000	(0.891)	0.000	(0.889)	0.000	(0.878)	0.000	(0.955)
Entrepreneur CEO	-0.090	(0.577)	-0.068	(0.655)	-0.068	(0.657)	-0.064	(0.675)	-0.062	(0.681)
CEO STEM degree earned	0.145	(0.313)	0.155	(0.271)	0.156	(0.262)	0.155	(0.262)	0.154	(0.274)
CEO highest degree earned	-0.058	(0.027)	-0.047	(0.073)	-0.047	(0.074)	-0.046	(0.103)	-0.045	(0.115)
CEO age	-0.588	(0.374)	-0.586	(0.371)	-0.584	(0.363)	-0.580	(0.373)	-0.592	(0.369)
CEO is male	-0.340	(0.252)	-0.312	(0.302)	-0.310	(0.308)	-0.305	(0.319)	-0.303	(0.324)
CEO incentive compensation	-0.034	(0.662)	-0.042	(0.584)	-0.042	(0.587)	-0.040	(0.598)	-0.039	(0.604)
CEO is an outsider	0.178	(0.109)	0.169	(0.126)	0.170	(0.126)	0.171	(0.123)	0.169	(0.125)
CEO number of industries worked in	-0.028	(0.430)	-0.030	(0.395)	-0.030	(0.395)	-0.030	(0.401)	-0.030	(0.403)
CEO total years of work experience	0.001	(0.783)	0.002	(0.747)	0.002	(0.746)	0.002	(0.742)	0.002	(0.729)
Firm age	0.048	(0.004)	0.048	(0.004)	0.048	(0.004)	0.048	(0.004)	0.049	(0.004)
Firm performance	-0.032	(0.894)	-0.035	(0.884)	-0.035	(0.886)	-0.032	(0.893)	-0.037	(0.878)
Firm size	-0.165	(0.092)	-0.163	(0.093)	-0.163	(0.093)	-0.163	(0.094)	-0.166	(0.084)
Institutional ownership	-0.412	(0.544)	-0.442	(0.508)	-0.441	(0.511)	-0.442	(0.509)	-0.431	(0.519)
Firm number of patents	-0.030	(0.004)	-0.031	(0.004)	-0.030	(0.005)	-0.032	(0.012)	-0.031	(0.013)
Strategic distinctiveness (t)	0.458	(0.000)	0.458	(0.000)	0.458	(0.000)	0.458	(0.000)	0.457	(0.000)
Industry munificence	0.006	(0.397)	0.006	(0.405)	0.006	(0.414)	0.006	(0.413)	0.006	(0.407)
Constant	0.429	(0.478)	0.370	(0.541)	0.368	(0.534)	0.355	(0.560)	0.351	(0.566)
R-squared	0.7762		0.7763		0.7763		0.7763		0.7763	

a. N = 3,976. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively

Table A3. CEM models on stakeholder management[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			0.133	(0.420)	0.129	(0.436)	0.139	(0.412)	0.141	(0.405)
Inventor CEO × CEO power					0.062	(0.229)	0.068	(0.196)	0.067	(0.180)
Inventor CEO × slack							-0.039	(0.570)	-0.035	(0.619)
Inventor CEO × industry dynamism									-0.001	(0.817)
CEO power	-0.005	(0.855)	-0.007	(0.790)	-0.032	(0.224)	-0.031	(0.222)	-0.032	(0.209)
Slack	0.039	(0.096)	0.038	(0.100)	0.036	(0.090)	0.068	(0.230)	0.065	(0.242)
Industry dynamism	0.006	(0.225)	0.006	(0.218)	0.006	(0.191)	0.006	(0.187)	0.006	(0.195)
Entrepreneur CEO	-0.050	(0.801)	-0.107	(0.589)	-0.084	(0.668)	-0.109	(0.585)	-0.105	(0.589)
CEO STEM degree earned	0.116	(0.731)	0.115	(0.736)	0.101	(0.759)	0.103	(0.752)	0.108	(0.752)
CEO highest degree earned	0.171	(0.038)	0.157	(0.038)	0.161	(0.032)	0.163	(0.028)	0.161	(0.025)
CEO age	0.811	(0.498)	0.825	(0.493)	0.939	(0.445)	0.999	(0.404)	1.038	(0.432)
CEO is male	0.380	(0.176)	0.339	(0.275)	0.386	(0.255)	0.366	(0.293)	0.375	(0.311)
CEO incentive compensation	0.107	(0.361)	0.108	(0.355)	0.094	(0.392)	0.089	(0.436)	0.086	(0.425)
CEO is an outsider	-0.006	(0.945)	0.008	(0.926)	0.014	(0.861)	0.013	(0.868)	0.012	(0.874)
CEO number of industries worked in	-0.010	(0.832)	-0.014	(0.782)	-0.018	(0.712)	-0.022	(0.664)	-0.022	(0.665)
CEO total years of work experience	-0.000	(0.965)	-0.000	(0.985)	0.000	(0.978)	-0.000	(0.987)	-0.000	(0.968)
Firm age	0.101	(0.000)	0.095	(0.000)	0.094	(0.000)	0.091	(0.000)	0.091	(0.000)
Firm performance	0.141	(0.688)	0.124	(0.715)	0.190	(0.572)	0.173	(0.626)	0.179	(0.626)
Firm size	0.521	(0.001)	0.535	(0.001)	0.522	(0.001)	0.493	(0.001)	0.493	(0.001)
Institutional ownership	-3.618	(0.018)	-3.531	(0.020)	-3.543	(0.020)	-3.517	(0.019)	-3.522	(0.018)
Firm number of patents	0.072	(0.033)	0.073	(0.029)	0.073	(0.022)	0.075	(0.020)	0.075	(0.022)
Stakeholder management (t)	0.548	(0.000)	0.547	(0.000)	0.547	(0.000)	0.544	(0.000)	0.545	(0.000)
Industry munificence	0.013	(0.210)	0.013	(0.201)	0.013	(0.176)	0.014	(0.164)	0.014	(0.142)
Constant	-3.877	(0.003)	-3.720	(0.005)	-3.809	(0.005)	-3.686	(0.006)	-3.702	(0.008)
R-squared	0.8546		0.8547		0.8549		0.8550		0.8550	

a. N = 1,874. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively

Table A4. Strategic change in different set of technology-intensive industries[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			0.410	(0.054)	0.442	(0.043)	0.398	(0.058)	0.428	(0.045)
Inventor CEO × CEO power					0.124	(0.053)	0.135	(0.037)	0.138	(0.032)
Inventor CEO × slack							0.023	(0.062)	0.023	(0.056)
Inventor CEO × industry dynamism									0.005	(0.176)
CEO power	-0.037	(0.345)	-0.038	(0.314)	-0.065	(0.124)	-0.069	(0.108)	-0.070	(0.107)
Slack	0.002	(0.802)	0.005	(0.454)	0.005	(0.474)	0.009	(0.078)	0.009	(0.070)
Industry dynamism	-0.001	(0.598)	-0.001	(0.715)	-0.001	(0.770)	-0.000	(0.871)	-0.000	(0.888)
Entrepreneur CEO	0.155	(0.253)	0.073	(0.596)	0.079	(0.576)	0.111	(0.415)	0.108	(0.406)
CEO STEM degree earned	0.248	(0.235)	0.210	(0.332)	0.215	(0.325)	0.207	(0.352)	0.208	(0.357)
CEO highest degree earned	-0.120	(0.083)	-0.140	(0.042)	-0.150	(0.027)	-0.143	(0.034)	-0.141	(0.039)
CEO age	0.143	(0.918)	0.244	(0.857)	0.246	(0.858)	0.211	(0.877)	0.202	(0.883)
CEO is male	0.531	(0.127)	0.435	(0.253)	0.504	(0.186)	0.524	(0.168)	0.521	(0.173)
CEO incentive compensation	0.171	(0.355)	0.182	(0.335)	0.185	(0.332)	0.200	(0.301)	0.207	(0.294)
CEO is an outsider	-0.401	(0.028)	-0.366	(0.045)	-0.337	(0.070)	-0.326	(0.080)	-0.333	(0.067)
CEO number of industries worked in	0.009	(0.908)	0.011	(0.890)	0.021	(0.794)	0.019	(0.815)	0.019	(0.816)
CEO total years of work experience	-0.010	(0.442)	-0.013	(0.348)	-0.011	(0.392)	-0.011	(0.407)	-0.011	(0.420)
Firm age	0.006	(0.400)	0.004	(0.552)	0.000	(0.957)	-0.000	(0.988)	-0.000	(0.967)
Firm performance	-1.918	(0.000)	-1.916	(0.000)	-1.926	(0.000)	-1.926	(0.000)	-1.931	(0.000)
Firm size	-0.408	(0.020)	-0.406	(0.021)	-0.408	(0.020)	-0.410	(0.020)	-0.410	(0.021)
Institutional ownership	0.758	(0.611)	0.839	(0.577)	0.940	(0.534)	0.937	(0.536)	0.951	(0.532)
Firm number of patents	-0.007	(0.829)	-0.009	(0.775)	-0.003	(0.920)	-0.013	(0.638)	-0.013	(0.662)
Strategic change (t)	0.066	(0.009)	0.065	(0.011)	0.064	(0.012)	0.064	(0.013)	0.063	(0.014)
Industry munificence	0.000	(0.962)	0.001	(0.857)	0.001	(0.808)	0.002	(0.759)	0.002	(0.743)
Constant	-0.183	(0.824)	-0.018	(0.984)	-0.082	(0.925)	-0.106	(0.903)	-0.106	(0.904)
R-squared	0.4630		0.4638		0.4646		0.4650		0.4652	

a. N = 2,892. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively.

Table A5. Strategic distinctiveness in different set of technology-intensive industries[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			-0.283	(0.062)	-0.272	(0.071)	-0.287	(0.079)	-0.286	(0.065)
Inventor CEO × CEO power					0.048	(0.385)	0.052	(0.333)	0.052	(0.347)
Inventor CEO × slack							0.008	(0.450)	0.008	(0.448)
Inventor CEO × industry dynamism									0.000	(0.960)
CEO power	0.041	(0.034)	0.042	(0.036)	0.031	(0.171)	0.030	(0.190)	0.030	(0.191)
Slack	0.016	(0.001)	0.014	(0.004)	0.014	(0.003)	0.015	(0.024)	0.015	(0.023)
Industry dynamism	-0.002	(0.115)	-0.003	(0.089)	-0.003	(0.092)	-0.003	(0.102)	-0.003	(0.102)
Entrepreneur CEO	-0.359	(0.001)	-0.302	(0.002)	-0.302	(0.002)	-0.291	(0.003)	-0.291	(0.004)
CEO STEM degree earned	0.055	(0.666)	0.085	(0.504)	0.087	(0.506)	0.084	(0.514)	0.085	(0.513)
CEO highest degree earned	-0.018	(0.714)	-0.002	(0.974)	-0.005	(0.911)	-0.003	(0.956)	-0.003	(0.956)
CEO age	-2.005	(0.006)	-2.098	(0.006)	-2.107	(0.006)	-2.121	(0.007)	-2.121	(0.007)
CEO is male	-0.251	(0.366)	-0.186	(0.511)	-0.162	(0.573)	-0.156	(0.592)	-0.156	(0.591)
CEO incentive compensation	-0.109	(0.223)	-0.117	(0.189)	-0.117	(0.186)	-0.113	(0.208)	-0.112	(0.215)
CEO is an outsider	0.163	(0.136)	0.137	(0.201)	0.148	(0.163)	0.152	(0.148)	0.152	(0.141)
CEO number of industries worked in	-0.035	(0.433)	-0.036	(0.417)	-0.033	(0.472)	-0.034	(0.456)	-0.034	(0.457)
CEO total years of work experience	0.014	(0.027)	0.016	(0.019)	0.016	(0.019)	0.016	(0.019)	0.016	(0.022)
Firm age	-0.000	(0.984)	0.001	(0.860)	-0.001	(0.924)	-0.001	(0.896)	-0.001	(0.895)
Firm performance	-0.064	(0.523)	-0.065	(0.527)	-0.070	(0.523)	-0.069	(0.530)	-0.069	(0.534)
Firm size	-0.190	(0.095)	-0.191	(0.093)	-0.193	(0.086)	-0.194	(0.087)	-0.194	(0.087)
Institutional ownership	0.133	(0.836)	0.075	(0.910)	0.111	(0.869)	0.110	(0.870)	0.110	(0.870)
Firm number of patents	-0.030	(0.037)	-0.029	(0.037)	-0.027	(0.067)	-0.030	(0.108)	-0.030	(0.108)
Strategic distinctiveness (t)	0.474	(0.000)	0.473	(0.000)	0.472	(0.000)	0.472	(0.000)	0.472	(0.000)
Industry munificence	0.004	(0.101)	0.003	(0.163)	0.003	(0.139)	0.004	(0.134)	0.004	(0.136)
Constant	1.154	(0.012)	1.049	(0.019)	1.032	(0.021)	1.025	(0.023)	1.025	(0.023)
R-squared	0.7389		0.7394		0.7396		0.7396		0.7396	

a. N = 2,964. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively

Table A6. Stakeholder management in different set of technology-intensive industries[a]

Variable	(1)		(2)		(3)		(4)		(5)	
Inventor CEO			-0.085	(0.581)	-0.055	(0.736)	-0.043	(0.801)	-0.041	(0.813)
Inventor CEO × CEO power					0.102	(0.101)	0.096	(0.119)	0.096	(0.113)
Inventor CEO × slack							-0.042	(0.170)	-0.042	(0.201)
Inventor CEO × industry dynamism									0.001	(0.907)
CEO power	-0.023	(0.254)	-0.023	(0.258)	-0.045	(0.086)	-0.042	(0.091)	-0.042	(0.090)
Slack	0.013	(0.377)	0.013	(0.394)	0.017	(0.276)	0.041	(0.130)	0.041	(0.140)
Industry dynamism	0.006	(0.067)	0.006	(0.069)	0.006	(0.057)	0.006	(0.063)	0.006	(0.065)
Entrepreneur CEO	0.107	(0.516)	0.124	(0.484)	0.132	(0.447)	0.089	(0.603)	0.089	(0.604)
CEO STEM degree earned	-0.227	(0.393)	-0.222	(0.398)	-0.275	(0.312)	-0.265	(0.324)	-0.266	(0.336)
CEO highest degree earned	0.209	(0.040)	0.216	(0.032)	0.222	(0.029)	0.227	(0.029)	0.228	(0.028)
CEO age	-1.292	(0.118)	-1.345	(0.115)	-1.461	(0.092)	-1.376	(0.112)	-1.386	(0.095)
CEO is male	0.512	(0.160)	0.539	(0.132)	0.588	(0.126)	0.545	(0.173)	0.544	(0.181)
CEO incentive compensation	0.075	(0.506)	0.075	(0.505)	0.079	(0.493)	0.080	(0.489)	0.081	(0.454)
CEO is an outsider	0.026	(0.821)	0.016	(0.891)	0.062	(0.616)	0.054	(0.652)	0.053	(0.654)
CEO number of industries worked in	0.057	(0.160)	0.060	(0.141)	0.060	(0.157)	0.059	(0.148)	0.060	(0.130)
CEO total years of work experience	0.011	(0.226)	0.012	(0.221)	0.014	(0.156)	0.014	(0.186)	0.014	(0.167)
Firm age	0.074	(0.004)	0.074	(0.004)	0.070	(0.004)	0.067	(0.005)	0.067	(0.005)
Firm performance	0.126	(0.402)	0.122	(0.419)	0.129	(0.389)	0.102	(0.502)	0.100	(0.547)
Firm size	0.178	(0.198)	0.177	(0.198)	0.169	(0.228)	0.162	(0.259)	0.162	(0.259)
Institutional ownership	-1.819	(0.026)	-1.848	(0.022)	-1.681	(0.030)	-1.643	(0.033)	-1.643	(0.033)
Firm number of patents	0.113	(0.000)	0.113	(0.000)	0.114	(0.000)	0.116	(0.000)	0.116	(0.000)
Stakeholder management (t)	0.614	(0.000)	0.615	(0.000)	0.614	(0.000)	0.612	(0.000)	0.612	(0.000)
Industry munificence	0.013	(0.033)	0.013	(0.035)	0.013	(0.035)	0.013	(0.042)	0.013	(0.038)
Constant	-2.536	(0.019)	-2.559	(0.017)	-2.592	(0.017)	-2.470	(0.024)	-2.469	(0.024)
R-squared	0.8719		0.8719		0.8723		0.8723		0.8724	

a. N = 1,596. P-values in parentheses. Two-tailed tests for all variables. Year dummies included in all models. Some variables were rescaled to allow proper reporting: slack, industry dynamism, CEO age, firm number of patents, and industry munificence were rescaled to be 1,000th, 100th, 100th, 100th, and 1,000th of their original values, respectively