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PEOPLE DRIVING PERFORMANCE: THE FINANCIAL IMPLICATIONS OF HUMAN
CAPITAL FOCUS AS HIGHLIGHTED IN FIRM ANNUAL REPORTS

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ABSTRACT

In an age of technological advancement and rapid innovation, markets have become increasingly competitive and firms now need to find new sources of unique competitive advantage that will allow them to retain and improve their market share. Although product innovation has historically been considered the primary factor in firm success, this study aims to investigate critical role of human capital as a source of sustainable competitive advantage that can be recognized by firms. Human capital theory has long suggested that firms should be able to benefit from strategically investing in the knowledge and skills of their employees. Empirical research has demonstrated the important role of strategic human resource management but less research has been done examining how the human capital focus of key decision makers can influence firm level outcomes. As such, this study examines the link of the human capital focus of firms as highlighted in their annual reports to the financial performance of 205 companies in the Major Pharmaceuticals Sector. Annual reports were coded for the relative frequency with which human capital terms were used and this frequency was related to annual gross firm income, controlling for firm size. The findings of this study have major implications for both the theoretical and applied fields of human capital. These implications include direct contributions to the methods that are currently being used to analyze firms, specific insights into the complex and cross-functional dynamics of firm performance, and the advancement of the theoretical literature in support of human capital theory. Ultimately, findings support the belief that firms can generate a specific, measureable competitive advantage through their investment in human capital across the firm.

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Chapter 1

Introduction

In an increasingly complex global marketplace, firms are constantly searching for new sources to drive and extend their competitive advantage (Wagner & Hollenbeck, 2014).

Although technological innovation has consistently been the source of competitive advantage that firms have utilized in the past (Hall, 1993), there is growing research that suggests a change could be taking place. Recent theory, research, and practice have been shifting the foundation of firm success away from traditional external innovation and financially measures to internal metrics that focus on the human capital of employees and their impact on firm relevant outcomes (Crook, Todd, Combs, Woehr, & Ketchen, 2011). This research aims to examine if there are significant financial implications for firms that embrace the shift toward human capital and thus emphasize their internal focus on human capital through key reports and sources of communication. Specifically, research supporting the resource-based view of the firm indicates that firms are capable of recognizing a unique, sustainable competitive advantage by investing in the human capital of their employees. Furthermore, upper echelons theory suggests the human capital focus of a firm's leaders is critical to firm strategy and such focus may be found in the writings of executive annual reports. Annual financial reports are a key source of direct communication between the top management of the firm, their shareholders, and the general public so the strategic lens through which they view the world may be apparent in such reports.

Despite an abundance of literature on human capital theory and its various subcomponents, previous research falls short in its ability to examine the impact of the shift in human capital focus on the applied business practices of a given industry on a large scale.

Although research on human capital theory has grown in the last twenty years (Ployhart &

Moliterno, 2011), there has been limited effort to connect the proposed theory to the real-world experiences of firms in the marketplace. Additionally, very few researchers in the management and labor fields that have analyzed the rising role of human capital in firm performance have attempted to bridge the gap between the finance and human resource business functions. As a result, the support for and acceptance of human capital theory by executives and upper-level management has grown at a very slow pace in many firms, limiting the potential for increased efficiency for firms and consumers alike. This divide between theory and practice may continue until there is significant research that suggests to decision makers within firms that an investment in, and active emphasis on, human capital in their culture can produce positive financial outcomes.

The current research seeks to fill the void between theory and practice by extending previous findings by examining the relationship between firm financial performance – as measured by gross revenue – and human capital emphasis in firm annual reports. More importantly, this study offers an interdisciplinary view of the balance between finance and human resources and aims to extend our theoretical and practical understanding of the impact of human capital in firms. Findings from this research may serve as the foundation for further investigation into the financial implications of human capital theory and provide a framework that can be easily understood by decision makers within firms. By establishing a connection between human capital focus and the financial value of comprehending and adopting related ideas that have been suggested in prior research, findings from this study may inform decision makers whether it is appropriate to invest in the human capital of their employees on a wide scale. The practical and theoretical implications of beginning to consider human capital theory in

this light are numerous, and this study furthers the recent research efforts of the field into a more market-specific, industry-applicable approach.

This study focuses on all of the firms in the major pharmaceuticals subsector of the healthcare industry as defined by the Nasdaq Stock Exchange. After eliminating cases due to missing reports or missing financial data, the final sample included 205 firms with sufficient data for analysis. Text mining in R enabled the creation of a human capital index that weights the relative value each firm puts on their human capital by coding the annual financial reports of these firms. The simultaneous reported revenue for the 2015 fiscal year enabled analysis of the relationship between how much firms are communicated a human capital focus and the financial value added to the firm. The study also offers a model that aims to bring together distinct components of human capital to establish a baseline level of quantified firm emphasis on human capital. This combination of both qualitative and quantitative analysis is not prevalent in the current literature and serves as an early attempt to provide a comprehensive view of the firm using the triangulation of such approaches. In the same way that each firm in this study cannot operate individually as a finance division or a human resource division, the analysis would be incomplete without inclusion of both human capital and financial variables. The proposed model adequately addresses this comprehensive view of the firm and allows for a unique analysis that has not been conducted to this point.

Ultimately, this study looks to take the next step in the literature on human capital theory – specifically, to provide quantitative analysis that examines whether the adoption of human capital investment at a widespread level in major firms, as evidenced by its focus in financial statements, is related to firm performance. The proposed model – and the human capital index on which it is based – provides a new way of considering the role that human capital plays in the

firm and examines distinct components that drive human capital within the firm. By examining the possibility of a relationship between human capital emphasis and financial performance, this study serves as a starting point for more applied research that seeks not only to advance the scholarly knowledge of human capital theory, but also the relevance and promise that this knowledge can bring to firms to drive competitive advantage in a unique fashion.

Chapter 2

Literature Review

In an effort to further understand the core components of human capital theory and the relationship that a human capital focus shares with firm performance, a preliminary review of the scholarly and industrial literature focusing on the topic was conducted in the hopes of discovering the key trends and theories currently in circulation. This review revealed several major topics of interest and well-confirmed theories that served as the foundation for hypotheses and theoretical logic discussed throughout the remainder of this paper. Specifically research findings and theory based on the resource-based view of the firm (Barney, Wright, & Ketchen, 2001), upper-echelons theory (Hambrick & Mason, 1984), and the role of strategic human resource management practices (Huselid, 1995) establish the importance of human capital factors for maintaining culture and for enabling strategic execution within a firm.

Resource-Based View of the Firm

The resource-based view of the firm (RBV) is one of the most broadly recognized and accepted theoretical perspectives in the field of strategic human resource management (SHRM). Although earlier research emphasized the importance of a firm's resources in maintaining its competitive position (Penrose, 1959; Rubin, 1973; Wernerfelt, 1984), Barney (1991) offered a more formalized theoretical framework for understanding sources of competitive advantage for firms. He argued that firms gain competitive advantage when their internal resources are valuable, rare, inimitable, and non-substitutable (VRIN). Resources are *valuable* when they contribute to a firm's strategic goals or enable firms to implement strategies to improve effectiveness; *rare* when they are not possessed by a large number of firms; *inimitable* when

other firms are unable to obtain or copy them (either due to specific historical conditions, causal ambiguity, or social complexities within firms); and *non-substitutable* when there are no other valuable resources that can be utilized to implement the same strategies (Barney, 1991). Firms can be said to have achieved sustainable competitive advantage only when efforts to imitate or duplicate such advantage have not been successful. Subsequently Barney and Wright (1998) argued that firms must be organized to capitalize on the competitive advantage gained by having high quality human resources and work processes.

Because of the wide use of RBV in SHRM research, a number of empirical studies have claimed to build on the theory or, at the very least, rely on similar logic (Wright, Dunford, & Snell, 2001). Empirical studies often test the linkage between human resource practices (HR practices) and organizational performance to determine whether certain aspects of firms' HR practices create sustainable competitive advantage. For example, research has shown that high performance work systems create competitive advantage by reducing employee turnover and increasing employee productivity and performance (Huselid, 1995; Takeuchi, Lepak, Wang, & Takeuchi, 2007), and human resources interact with preferred strategy to influence team performance (Wright, Smart, & McMahan, 1995).

Although there is evidence of a positive HR—firm performance link rooted in applications of RBV, there have been few direct tests of the theory itself. SHRM scholars and RBV critics have noted that although these studies provide insight into the aspects of HR that may contribute to an organization's competitive advantage, RBV is often used as a “broad justification” for considering specific relationships (Becker & Huselid, 2006; Chadwick & Dabu, 2009). These scholars argue that RBV does not offer testable hypotheses or clarify how rare and valuable resources should be specifically defined or measured, and research has not empirically

assessed whether certain HR practices are causally ambiguous, path dependent, or inimitable (Wright et al., 2001). Barney's (1991) initial definition of competitive advantage as the ability of a firm to "improve its efficiency and effectiveness in ways that competing firms cannot" is rather tautological and, though research has mostly focused on performance and the generation of economic rents, may rely on a number of definitions depending on the industry or organization.¹ Despite the issues involved with testing RBV itself, however, it has been useful for explaining the HR—performance link in a number of studies and has provided insight for two additional perspectives in particular: (a) dynamic capabilities and (b) human capital theory.

Dynamic Capabilities

Research on RBV has recognized that, in order for organizations to gain and sustain "competitive advantage," they should not only have VRIN resources, but also have the competencies to use them effectively (Mahoney & Pandain, 1992). Research following Barney's (1991) RBV perspective extended this logic by attempting to understand how organizations may use these resources effectively in rapidly changing environments. Teece, Pisano, and Shuen (1997) argued that a dynamic capabilities perspective could be used "to explain how combinations of competences and resources can be developed, deployed, and protected" and to understand the "newer" sources of competitive advantage. Similarly, Eisenhardt and Martin (2001) described dynamic capabilities as processes or routines that organizations use to integrate, reconfigure, or gain and release resources – essentially, how organizations continue to learn. In times of moderate to high dynamism with more or less predictability, firms either rely on path-dependent, existing knowledge, or iterative, experiential routines, respectively, to learn and

¹ As Barney (2001) later suggests, researchers might consider abandoning the term "competitive advantage" altogether and instead specify precisely what they are trying to explain in the HR—outcomes link (i.e. above-average industry profits, economic rents, etc.).

create new competitive advantage (Eisenhardt & Martin, 2001). A dynamic capabilities perspective – making up for RBV’s static nature while also supported by its core propositions – is critical for understanding how organizations adapt, compete, and continue to be flexible in their changing markets (i.e., Dyer & Ericksen, 2007; Dyer & Shafer, 2003; Sirmon, Hitt, & Ireland, 2007).

Human Capital Theory

Although human capital theory is arguably its own major theoretical perspective within the field of strategic management, Barney’s (1991) emphasis on VRIN human resources and assets as essential for sustaining competitive advantage, and Barney & Wright’s (1998) extension that the firm must be organized to take advantage of human resources, makes it difficult to fully separate the two. Human capital theory emphasizes that firms invest in developing employees’ skills if they expect a return on such investment via employee productivity (Becker, 1964). Generic human capital refers to more general skills and abilities that are transferable to multiple organizations, while firm-specific human capital is not as mobile or applicable in outside organizations and has therefore traditionally been considered a source of competitive advantage.

A number of empirical studies have supported the theoretical link between human capital and competitive advantage or individual and organizational performance (Crook et al., 2011). For example, Batt (2002) showed that the use of high involvement work systems, which foster firm specificity of skills and employee attachment to firms, led to increased sales growth through reduced quit rates. Greater investments in firm-specific human capital selection and development have a positive impact on learning performance, while the inimitability of firm specific human capital leads to lower (at least initial) performance when employees move within industry (e.g.

Hatch & Dyer, 2004; Groysberg, Lee, & Nanda, 2008). Finally, general human capital can be a source of sustainable competitive advantage and increase unit performance and effectiveness if firm- or unit-specific human capital and behaviors (Ployhart, Van Iddekinge, & Mackenzie, 2011).

Upper Echelons Theory of the Firm

Similar to the resource-based view of the firm, upper echelons theory has gained wide acceptance in the labor and management fields since its introduction to the literature by Hambrick and Mason in 1984. Prior to upper echelons theory there was little consideration for the role that people, specifically the leaders of the firm, played in the strategic development of initiatives (Aguilar, 1967; Allen, 1979; Bourgeois, 1980; Mintzberg, Raisinghani, & Theoret, 1976). Rather, the strategy and effectiveness of the firm was evaluated as a standalone component of the corporate model (Hall, 1977), unattached to any personal characteristics or contributions, much in the same way that instructions accompany the assembly of home furniture. Additionally, broader economic and industry effects were thought to drive firm outcomes relative to the impact of human aspects of the executive team. Hambrick and Mason (1984) offered an alternative view of the factors involved in developing and guiding firm strategy and performance by suggesting that “top executives matter” and that their experiences, values, and personalities directly influence the choices they make regarding the firm. Additionally, several studies have found varying levels of support for the conclusion that, in addition to their personal characteristics, the demographic profiles of top executives are strongly indicative of potential strategic initiatives and performance outcomes (Boeker, 1997; D'Aveni, 1990; Eisenhardt & Schoonhoven, 1990). These ideas have been expanded upon to verify that focus should be placed on the entire top management team (TMT) given the role that

interpersonal dynamics may take on during a shared decision-making process (Eisenhardt & Bourgeois, 1988; Simons, Pelled, & Smith, 1999).

In their meta-analysis of the role of top executives in firm strategic actions and firm performance, Wang, Holmes, Oh, and Zhu (2016) suggest two primary reasons to support the role of executive characteristics in shaping future performance. Specifically, executive characteristics influence performance by shaping both the strategic and non-strategic actions of the firm. These non-strategic actions include the “day-to-day operational decisions” that are driven by personal characteristics and past experience, including management of relationships with internal and external stakeholders and development of organizational culture that can be passed down through middle management to lower-level employees (Wang et al., 2016). These conclusions are supported in the literature by a variety of studies that have found positive relationships between executive characteristics and a plethora of strategic initiatives within the firm, including environmental conservation and corporate social responsibility (Huang, 2013; Manner, 2010).

Upper Echelons and Executive Communication

The ways in which executives use public communications to shape perceptions of investors, employees, and other stakeholders of the firm are also documented in the literature. In their book, *CEO-Speak: The Language of Corporate Leadership*, Amernic and Craig (2006) highlight the importance of communications from top executives in sustaining an abundance of business practices, including appeals for capital, justification of financial statements, and guidance in mergers and acquisitions. Furthermore, the argument has been made that the language used in these communications can be seen to be representative of various firm-specific overtones (symbolic, emotional, cultural and political) and should be regarded as a key form of

strategic “sense-making” (Weick, 1995; Amernic, Craig, & Tourish, 2010). Amernic and Craig (2006) describe the objective of executive communication as consistently purposeful in defining the cultural tone of the firm stating, “the words and language are powerful and seductive rhetorical implements for fashioning outlook and opinion.” Finally, studies have explored how leaders use communication to influence desired firm behavior and establish an organizational vision, with the goal of aligning key stakeholders on values, goals, and strategy (Parry & Hansen, 2007; Gardner & Avolio, 1998).

There is also more detailed literature that supports the specific use of annual financial reports as a means of examining the strategic initiatives of top executives. Through examination of the Chief Executive Officer’s letter to shareholders of Enron, Starbucks, and General Motors, Craig and Amernic (2011) found that such documents were useful in an effort to provide “insight to aspects of corporate leadership and the ambient ethical culture of a company.” A highly valuable component of the annual financial report, the letter to the shareholders crafted by the CEO often highlights components of the firm’s strategy, successes from the previous year, and offers a sampling of the goals that have been identified by top executives for the firm in the year to come. Furthermore, it has been shown that the communications contained within these reports are intentionally constructed with the goal of aligning key stakeholders on strategic initiatives and corporate identity (Ditlevsen, 2012).

As upper echelons theory suggests, key executives will filter the competitive environment through their perceptual lenses and this may be manifested in the financial annual reports. This idea is supported by numerous studies that suggest top executives, through their words, offer their audience an explanation of their views on the world, the ways in which these views interact with firm strategy, and how those interactions result in firm behavior (Lakoff & Johnson, 1980;

Lakoff, 1993; Weick, 1995). Additionally, Amernic, Craig, and Tourish (2007) find that communications from the CEO are framed in a way that seeks to assist readers in understanding their world-views and the specific perceptions that drive their strategic view of the firm. As such, it is expected that the unique opinions, values, and characteristics of each top executive will come through in their public communication with the stakeholders.

For example, those executives who focus on people and human capital are more likely to communicate concepts related to human capital through the use of words such as “culture”, “human”, “people”, “talent”, and “teams”. As executives communicate their personal inclination towards people and human capital, it is expected that they would cover more firm-specific topics including the newly implemented use of teams to increase innovation (Deloitte, 2016), the importance of culture in guiding values (Barney, 1986), and the continuous development of talent across the organization (Silzer & Dowell, 2010). While the specific relationship between each of these concepts and human capital will be addressed later in this paper, the general interaction is of equal importance; namely, human capital is inherently manifest in the investment in, and development of, the skills of employees (Crook, Ketchen, Combs, & Todd, 2008). As such, executives that value, and consequently focus on, human capital should more frequently mention the topics discussed above. Figure 1 displays the proposed model guiding this study in which the terms mentioned above comprise the indicator variables of the Human Capital Index model and serve as proxy measurements for the amount of human capital focus that a firm places on human capital in their annual report.

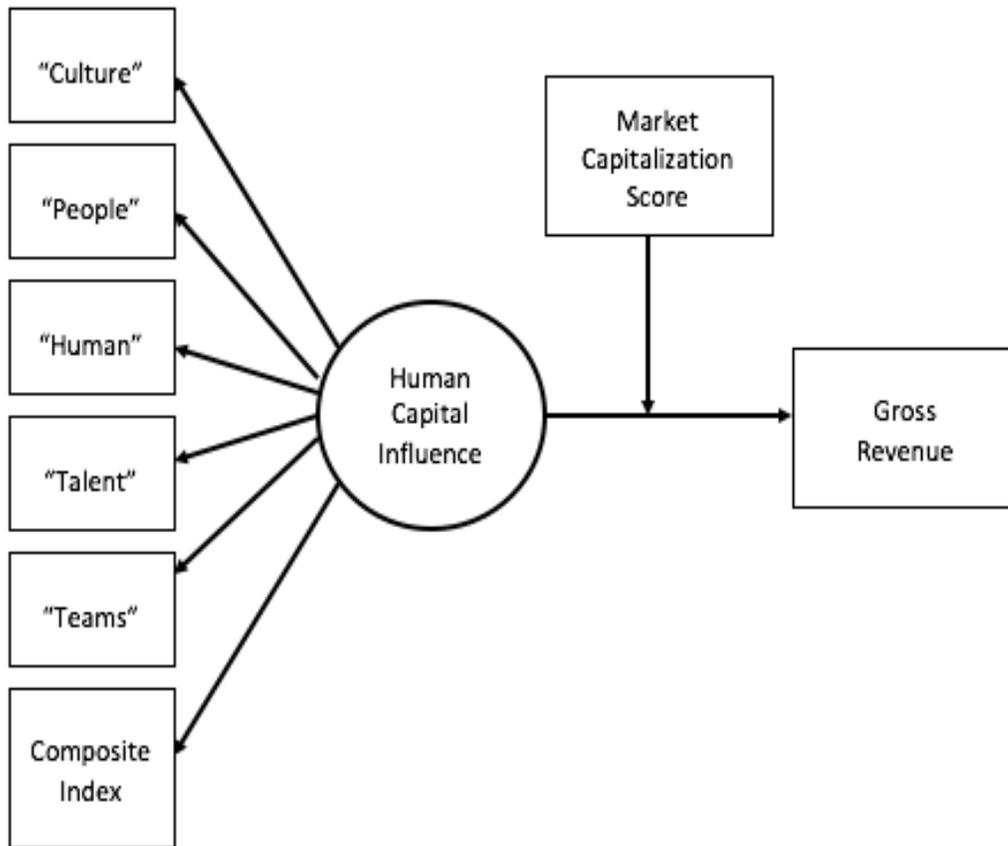


Figure 1: The Human Capital Index Model

Prior research also supports the idea that communications through publicly released firm documents – mission statements, annual reports, 10-K filings – indicate key perspectives of executives. In the absence of self-reported measures, researchers have focused on other methods of deconstructing the characteristics of firm documents through the use of unobtrusive measures (Webb & Weick, 1979; Chatterjee & Hambrick, 2007). For example, Ham, Seybert, and Wang (2014) analyzed more than a decade’s worth of annual reports from nearly 400 S&P 500 companies to determine the relationship between the signatures of 605 CEOs (as a measure of their narcissism) and firm performance. Similarly, the prominence of the CEO’s photograph in

the company's annual report has been used as an unobtrusive measure to capture narcissistic tendencies (Olsen, Dworkis, & Young, 2014; Chatterjee & Hambrick, 2007; Schrand & Zechman, 2012). The purpose of this study is not to focus on the narcissistic nature of firm executives, but previous findings in this area support the use of financial annual reports as a forum through which the characteristics of executives can be observed. As such, the model supports the idea that communications through financial annual reports are likely to show variation corresponding to the differences in executive beliefs about the role of people and human capital.

The resource-based view of the firm has long been accepted by theorists in the fields of labor and management as providing ample evidence that firms can achieve a unique, sustainable competitive advantage through the development of valuable, inimitable, rare, and non-substitutable resources. Additionally, the relationship between human capital – as identified and developed within the framework of the resource-based view – and firm performance has been supported in past research. Furthermore, there is ample research supporting upper echelons theory and the degree of influence with which executives' experiences, values, and personalities shape firm strategy and execution. Combining these core components of human capital theory, the first hypothesis proposes that the level of emphasis firms place on human capital can be measured through the strategic communications of upper management – namely, their annual reports – and that this level of emphasis will be positively related to firm performance.

Hypothesis 1: Higher values of human capital emphasis in firm financial reports, as measured by the Human Capital Index, will be positively related to revenue.

Culture and Strategic Human Resource Management

The complementary existence of strategic human resource management and organizational culture is at the center of human capital theory and plays a major role in the ability of firms to recognize the competitive advantages that are suggested by the resource-based view of the firm. As a business practice, human resource management capabilities focus on attraction, retention, motivation, development and use of human capital within firm (Coff, 1997; Kamoche, 1996; Mueller, 1996). Alternatively, organizational culture implements the use of community building techniques including values, ritual, behaviors, and visionary planning to identify and leverage resources to accomplish company goals (Lado, Boyd, & Wright, 1992; Merron, 1995).

Although organizational culture can take on many forms within an organization, Schneider, Brief, and Guzzo (1996) found that “most organizations today do not foster conditions in which personal initiative can ignite change.” This implies the need for SHRM practices to serve as the source of culture creation and sustainment within the organization. However, firms that can create a culture that balances teamwork, strong leadership, and rational systems have the greatest chance to employ individual employees to take on initiative and impact change (Schneider et al., 1996). Similarly, Daniel Denison (1990) offers four key concepts that describe the impact of organizational culture on firm performance: the involvement of the organization's members; adaptability to respond to new circumstances while still retaining its basic character; a consistency or strong, clearly defined culture; and a clear mission providing direction and meaning. Based on Denison's characteristics, it is apparent that human capital is at the center of organizational culture and that proper investment in culture can potentially result in competitive advantage for the firm. These competitive advantages are also supported in research

findings that show support for associations between organizational culture and firm performance in terms of financial performance, market valuation, reputation, analysts' recommendations, and attitudes among employees (O'Reilly, Caldwell, Chatman, & Doerr, 2014).

Acting in unison, human resource management capabilities and organizational culture have the ability to impact the organization at every level, from increased motivation and output at the individual employee level to investment in and creation of firm-wide human capital at the management level. As such, effective implementation of these practices should be considered a top priority for firms as they aim to increase the human capital within their firms.

Technical vs. Strategic Effectiveness

Huselid, Jackson, and Schuler (1997) make the distinction of two specific types of effectiveness when considering strategic human resource practices: technical effectiveness and strategic effectiveness. Technical effectiveness can be measured across traditional functions of the firm that have long been of concern for key stakeholders, such as recruiting, selection, performance appraisals, training, and benefits/salary management. Strategic effectiveness, on the other hand, focuses on the idea of ensuring that human capital within the firm is being utilized to produce the most efficient results at the firm level. Strategic effectiveness is recognized through innovative workplace practices that allow employees to collaborate with each other and contribute to a higher aggregate level of human capital. Some practices that most effectively enhance strategic effectiveness include "team-based job designs, flexible workforces, employee empowerment" and a variety of other actions that a firm can take to invest in its workforce beyond conventional thinking. Human resource managers should be aware of the potential for human capital creation and additive synergies that can potentially add to the bottom line of their firms (Huselid et al., 1997).

Ultimately, strategic human resource management practices must be effectively implemented to develop, promote, and maintain an organizational culture that maximizes the value added by human capital within the firm. In doing so, managers will be able to recognize the many benefits that are outlined in the literature in association with the development of high-performance human resource practices (HPHRP) including increased motivation, higher levels of employee efficiency, and lower levels of employee turnover (Becker & Huselid, 1998, and Delery & Shaw, 2001). Given the abundance of support in the literature for the importance of organizational culture as a driver of human capital development – and corresponding performance – within the firm, it is argued that culture will be a key component of the Human Capital Index and will strongly relate to firm performance.

Hypothesis 2: When considering the indicator variables included in the Human Capital Index, the frequency of “culture” will be most strongly and positively related to revenue.

The Role of Firm Size

The impact of firm size on financial performance has been widely documented in the international financial literature with a vast majority of the empirical research supporting the presence of a positive relationship between the two (Wincent, 2005; Majumdar, 1997; Hall & Weiss, 1967). Additionally, there is strong support in the literature for the use of market capitalization as a relative measure of size when comparing firms. Calculated as the product of share price and number of shares outstanding, market capitalization is not tied to the revenues or assets of a firm, providing a more market-based representation of firm size in comparison to other firms.

Furthermore, larger organization may be less nimble and flexible, thus impeding their ability to effectively deploy human capital and reducing the strength of the relationship. Darnall,

Seol, and Sarkis (2009) find that larger firms are less responsive to internal pressures signaling the possibility of structural complexities related to firm size. As firms grow in size and complexity, the direct communication between top executives and other employees becomes less frequent, even nonexistent, decreasing the likelihood that messages about culture and strategic vision will be communicated appropriately. Additionally, the larger a firm is, the greater the internal regulation or bureaucracy, resulting in longer durations of time before strategic initiatives are able to fully permeate throughout the entire organization (Williamson, 1975). This makes it difficult to discern how much of the human capital focus in a specific annual report is truly apparent in the organization's day-to-day practices. In contrast, small firms will be highly sensitive to the focus on human capital because small firms will be greatly affected by the talent available to execute strategy. Similarly, Stock, Greis, and Fischer (2002) found that smaller firms exhibit higher levels of dynamic innovation performance and are more capable of processing change quickly and efficiently. This would suggest that the firm would be more likely to accurately reflect the current views and strategies of management in the day-to-day practices of employees.

Given these characteristics about the role of firm size, and in the interest of developing a model that takes firm size into account, the third hypothesis accounts for the possibility that firm size may exhibit a moderating effect on the relationship between HCI and firm performance.

Hypothesis 3: Market capitalization will moderate the relationship between HCI and revenue, such that the relationship between HCI and revenue will be stronger and more positive when market capitalization is low and weaker, but still positive, when market capitalization is high.

Chapter 3

Methodology

In an effort to determine the relationship between the human capital focus in a firm's annual report and their financial success, primary research was carried out in the form of both qualitative and quantitative analysis. This process included selection and creation of the data set, text mining of firm annual reports using statistical software, design and creation of the human capital index, and corresponding regression analysis.

Data Set Creation

Sample Analysis and Selection

After reviewing previous research, certain criteria for a strong, compelling data set became apparent. First, it was important to focus on a peer group of similar firms within a given industry to control for industry effects in the study and limit the number of external factors that could influence the results. Second, the peer set needed to have prior research on the prevalence of human capital in the industry to establish a baseline of the influence and importance of having a human capital emphasis. Finally, the peer set needed to be practically relatable to other industries so that the results of the study could be reasonably assumed to be applicable in other industries, both for future research and industry application. Ultimately, the targeted organizations included publicly-traded companies in the major pharmaceuticals subsector of the healthcare industry as defined by the Nasdaq Stock Exchange. The final data set consisted of 205 firms with complete information for inclusion in the analysis.

By focusing the analysis on a single sector, the dilemma of considering industry effects in the analysis and interpretation of results was eliminated. The focus on the major pharmaceuticals sector also allowed for a more thorough review of the prior literature on the prevalence of human

capital within the data set. Boekestein (2006) examined the relationship between the intellectual capital (a combination of human, relational, and organizational capital) of major pharmaceutical firms and found there was strong evidence for the presence of intangible assets in these firms, suggesting a strong presence of human capital within these firms. Similarly, Bharathi Kamath (2008) found that human capital was the most prevalent component of intellectual capital and the leading driver of profitability and productivity for the top 25 firms in the drug and pharmaceutical industry in India from 1996 to 2006. Yet another example of the prevalence of human capital in the pharmaceutical industry is offered in the perceptual analysis of human capital within the top 15 Jordanian pharmaceutical firms as reported by surveys of 132 top and middle-level managers at the companies being examined (Sharabati, Naji, & Bontis, 2010). This collection of prior research supports the connection between human capital and the major pharmaceuticals sector while offering an encouraging baseline measure of the prevalent role of human capital in the firms of the data set.

Lastly, the industry and sector dynamics that shape the competitive landscape of major pharmaceuticals and health care provide an interesting testing ground for the proposed model. As highlighted, there is a strong presence of, and corresponding demand for, human capital within these firms which can be assumedly derived from the need for continuous product innovation and development to maintain a competitive advantage (Bharathi Kamath, 2008). As such, the major pharmaceuticals subsector is an excellent business area to conduct an initial analysis, given the high degree of industry characteristic compatibility to the other sectors in the health care industry and the marketplace at large.

Given the support provided by the literature for the use of the major pharmaceuticals sector as the peer group of firms, an effort was made to find a representative sampling of firms

that would allow for comprehensive analysis that could be applied to the sector as a whole.

Ultimately, the targeted population consisted of the 396 firms within major pharmaceuticals subsector that were included in the Nasdaq Stock Exchange's directory of approximately 800 health care companies. Of these 396 firms, 22 firms were eliminated because they did not report a market capitalization value, or the records contained a non-existent value for either the number of shares outstanding or the share price, the two components of the valuation formula for market capitalization. The focus remained on publicly traded firms that could be evaluated by traditional financial metrics as well as by the HCI method offered in this study, and that could illuminate the role of firm size as reported in the analysis. The remaining population of 374 firms was analyzed to determine an average market capitalization of \$6,064,960,517 and an average 2015 gross revenue of \$2,261,159,318.70. Of these 374 firms, there were reporting inconsistencies – Initial Public Offerings that occurred after the 2015 fiscal year and inaccessible or incompatible annual reports that could not be analyzed in the text mining package – that further excluded firms from the final sample examined in the analysis. Ultimately, the final sample consisted of 205 firms in the major pharmaceuticals sector, representing 54.8% of the total population, with an average market capitalization of \$9,186,550,336 and an average 2015 gross revenue of \$2,261,159,318.70.

The primary goal during the creation of the firm sample was to be as inclusive of the population as possible and, although the sample that was used for data collection exhibits a higher average market capitalization than the total population, the sample is still representative of the major pharmaceuticals sector given the number of smaller market capitalization firms that have issued Initial Public Offerings during the 2015 and 2016 fiscal years, and thus could not be included in the sample. In addition, the average 2015 gross revenue of the population and the

data sample are of comparable size, suggesting that firm financial performance of the sample and population are in line, and any significant difference in the market capitalization values of the population and the sample is potentially a result of improper valuation of the share price of certain companies by the market.

Financial Analysis of the Sample

The final aspect in the selection and creation of the sample was the determination of the measures to judge firm financial performance. An abundance of the financial and accounting literature focuses on metrics such as return on equity (ROE), return on assets (ROA), relative change in price per share, and various other financially derived measures, but these were avoided as measures of firm performance for two primary reasons. First, there is a large volume of literature that suggests and confirms the use of accounting procedures to manipulate balance sheet and income statement values in an effort to achieve a certain value for these more commonly examined financial measures to appease financial analysts and shareholders. It is widely accepted in the finance and accounting professions that financial managers and decision makers in companies exercise their ability to “make operational choices at year-end in order to make asset accounts appear better than on any average day” (Ross, 2005). In addition to the potentially misleading nature of traditional financial measures of firm performance, these measures fail to foster a comprehensive view of the firm and encourage a valuation perspective that discredits the human capital model and the role of value generation by the employee by treating human resources primarily as a cost rather than an investment. Over time it is possible that equity, ROE, and ROA will be influenced by human capital but effects would have to cumulate over years. It is argued here that human capital, to the degree that it exists within a firm, is likely to manifest over a shorter time period as increases in revenue within a given year.

In an effort to promote a measure of firm performance that would be both holistically representative of the firm and representative of the value driven by the firm's human capital, the analyses focused on financial performance as gross revenue for the firm as reported during the 2015 fiscal year. The decision to measure performance in terms of the gross revenue of the firm is well supported in the literature, if not on Wall Street, as an appropriate measure of the value of the firm. Chandra and Ro (2008) argue that "revenue may ... contain information on future earnings and cash flows (for example, because of greater persistence) that is lost when it is aggregated with gains, losses, and expenses into earnings." The authors also suggest that there has been an increase in the use of revenue for firm valuation in recent year, as can be seen in the upward trend of analysts reporting and interpreting sales numbers in quarterly performance reports on firms. Furthermore, it has been suggested that sectors and industries that are characterized by rapid change, uncertainty, high innovation costs, and intense competition frequently experience a misaligned recording of costs and revenue using conventional accounting practices that fails to account for up-front cash expenditures with delayed financial benefits (Lev & Zarowin, 1999). In sectors and industries that exhibit these characteristics – including major pharmaceuticals – many theorists have suggested a return to simplistic valuation that accounts for the total productivity of the firm over time, with revenue as a driving measure of this valuation method (Chandra & Ro, 2008; Lev & Zarowin, 1999). Finally, revenue is a favorable measure of firm financial performance in the model because it is not impacted by many of the expenses that a firm faces that extend beyond the control and impact of individual employees; as such, revenue serves as a maximum representation of the value generated by the human capital of the firm. However, gross revenue in a given year must take into account firm

size as well as the previous year's performance, so controls are included to adjust for these factors.

The Mergent Online Database enabled collection of all of the relevant financial information that was used in this study, including 2015 market capitalization values and gross revenue for both the 2014 and 2015 fiscal years. This data was also cross-referenced with the values indicated in the annual reports to confirm the appropriate data for each firm.

Text Mining of Annual Reports

As a method for qualitative analysis, text mining is a relatively new practice to the field and, though it has been garnering more use as statistical software packages become more user-friendly, there is limited general research – and none of the fields of labor and management – that has applied a similar method to the one proposed in this study for the purpose of qualitative data collection. However, there have been studies that have focused on various text mining packages as the primary source for analyzing large numbers of documents with the goal of generating word frequencies that are representative of the contents of the documents and can be used for relational analysis. For example, text mining software was used to examine 119 refereed journal articles and proceedings papers in an effort to establish longitudinal trends of academic articles in mobile learning (Hung & Zhang, 2012). The researchers used the word frequencies that were generated through the use of a statistical software package to determine relevant groupings of topics discussed in the documents through the use of abstract analysis with the support of text mining (Hung & Zhang, 2012). A more related example of the use of text mining can be seen in a 2013 study of board meeting proceedings and profitability of a Japanese retail firm, in which Takahashi, Kido, and Hashimoto (2013) analyzed the minutes of board meetings over a two-year span and extracted 84 words that were used more than 30 times throughout the

proceedings. The frequency with which those words were used was then compared to the firm's overall profit margin on sales during the same time period. Text mining appears to be a valuable way to perform large scale qualitative analysis on the firms in this study based on text mining examples in other fields of research and Feldman and Dagan's (1995) definition of text mining as "... the process of extracting meaningful, non-trivial patterns or knowledge from a set of unstructured texts."

To complete the qualitative analysis on the annual reports of the firms in the sample, the R Project for Statistical Computing was utilized as the primary tool in the text mining process to compile the data for word frequency. However, the technical limitations of the system required a certain amount of document preparation prior to being able to run the annual reports through the text mining package. After the companies were identified and the relevant background and financial information had been collected, a PDF copy of each firm's 2015 financial annual report was downloaded from the company website. All of the firms in the data set are publicly traded companies and, as such, are required to submit an annual filing pursuant to Section 13 of the Securities Exchange Act of 1934. The PDF document was then loaded into Adobe Acrobat Pro and exported as a plain text format document, where it was appropriately labeled and prepared to be run through the R syntax.

This code effectively produced the primary component of the qualitative data that was used to define the human capital emphasis of each firm in the data set – a term matrix for each of the annual reports in the data set. A cleaned copy of the syntax that was used to text mine each firm's annual report can be found in Appendix A. The term matrix provided a list of all the words that were used in each company's annual report, the number of times each word was in the specific document, and the total number of words used in each document. This document

enabled a search for specific terms, a function that would be used to examine individual components of emphasis and build the Human Capital Index.

Human Capital Index

In an effort to assess the holistic emphasis that firms place on human capital throughout their annual reports, a single measure, the Human Capital Index, combined all of the contributing aspects of human capital into one variable for analysis. Similar to the approach taken by Sharabati et. al (2010) in their analysis of pharmaceutical firms in Jordan, the model was designed with the goal of addressing specific sub-phenomena of the first-level construct of human capital. Pulling from the studies that were mentioned in the literature review as well as current industry trends, the Human Capital Index (HCI) included Culture, Human, People, Talent, and Teams as indicator variables.²

Culture

As highlighted in the literature review, culture is by far one of the most significant topics in the human capital literature and arguably the most prevalent subject in the minds of corporate executives. In their 2016 survey of more than 7,000 global business leaders across 130 different countries, Deloitte Consulting indicated that 86 percent of those surveyed felt that culture was “very important” in terms of specific talent challenges facing their organizations, while 82 percent believed that “culture is a potential competitive advantage.” Furthermore, companies such as Google, Zappos, and Southwest Airlines are lauded in the news for their excellent cultures and productivity; all while other firms scramble to better understand their own cultures

² It’s worth noting that “capital” was not included as an indicator variable in the Human Capital Index because we felt as though the term would include too many false indications of human capital emphasis. Specifically, we believed that “capital” would be more frequently used to describe financial condition or to define physical assets of the firm. Similarly, “employee” was not included as an indicator variable given the high level of ambiguity regarding the author’s tone when using the word.

and align on a common view for the firm. The case for inclusion of culture in the HCI is extremely strong, and likely will be for many years to come.

Human

As the leading word in “human capital,” human would need to be mentioned in the firm’s annual report if they intended to overtly discuss the concept of human capital. Similarly, an abundance of the strategic human resource management literature highlights the role of the human resources business function in the development and maintenance of a culture that actively promotes and foster human capital with employees. For example, Collins and Clark (2003) discuss the roles of human resources practices in the development of human assets for the firm with the goal of sustained competitive advantage for the firm. Much in the same way that the term “people” is central to the proposed model, the term “human” is central to the human capital model and is an excellent indicator variable to include in the HCI.

People

One of the core foundations of the model and this research is that people are at the center of the firm and are the primary drivers for all major business functions. As such, the inclusion of people in the HCI seemed logical and in agreement with the collective body of human capital literature presented in the literature review. Simply put, people are at the center of the human capital model and to exclude them would be a failure to include one of the major drivers of the study based on the proposed framework. On top of the obvious reason to include people in the HCI, there is evidence to suggest that executives at many firms are aware of the need to better incorporate human capital in their business strategies but fail to understand the concept at its more detailed levels. A 2011 survey by the Conference Board indicated that nearly 70 percent of company executives believed that their firms failed to assess human capital risks and

opportunities. Given this result, it is likely that, in the absence of more complex understanding, many executives are simply referring to their human capital efforts in the simplest of terms – namely, as “people.”

Talent

Carpenter, Bauer, and Erdogan (2012) define talent management as “the anticipation of required human capital for an organization and the planning to meet those needs.” As organizations continue to embrace the human capital movement in their firms, the term “talent” is consistently used in company filings as another way to refer to the human capital knowledge and abilities of employees within the firm. By developing their talent, firms are making an active investment in the human capital of their employees and by including this business practice in their annual reports, they are reaffirming their commitment to human capital within their firm.

Team

In Deloitte Consulting’s 2016 “Global Human Capital Trends Report” the authors indicate organization design, specifically the increase and more effective use of teams, as the number one trend that corporate leaderships teams indicated as “very important.” The authors indicate that companies are restructuring the designs of their organizations to allow for the implementation of a “network of teams” that allow managers to “build and empower teams to work on specific business projects and challenges.” Additionally, according to a survey taken by the National Association of Colleges and Employers (NACE) in 2013, recruiters indicated that the most desirable quality that an applicant could possess when submitting their application was “the ability to work well in teams.” Clearly there is a major focus in the current marketplace for the use of teams and the ability to combine and share human capital amongst employees to drive individual, team, and firm performance.

Mathematical Computation

As was mentioned above, the individual word counts for each of the indicator variables were collected using the text mining package within the R Project for Statistical Computing. These words were then compared to the total number of words in each firm's annual report to produce a relative amount of times that each word was mentioned within the document. The HCI was computed by summing each of the individual values for the indicator terms for a specific firm and then multiplied by a standardizing value of 10,000. This standardizing method was performed on all values so as to not alter the significance of the data in any way and was carried out in an effort to enlarge the value of the HCI with the hopes of simplifying the interpretation of results during regression analysis and presentation. Failure to increase the values potentially creates inversion problems due to rounding errors and small decimal values during the regression analysis.

Chapter 4

Results

Hierarchical regression was used to test hypotheses and evaluate the relationship between the Human Capital Index, its component indicator variables, market capitalization, and firm performance (Cohen, Cohen, West, & Aiken, 2003). The focus is on the significance of the index's predictive capabilities as a whole, rather than the significance of the individual indicator variables, although additional analyses are included as a way of re-confirming the theoretical rationale for the proposed index composition. Finally, the presence of a moderating relationship between firm size, as measured by market capitalization, and the HCI on firm performance is examined. Table 1 presents a review of variables included in the study as well as descriptions and abbreviations for each variable used throughout the study.

Table 1: Explanations and abbreviations for key variables

Variable	Acronym	Explanation
Gross Revenue 2015	REV '15	The gross revenue as reported by the firm in their 2015 annual report. The dollar value of total sales volume for the firm.
Gross Revenue 2014	REV '14	The gross revenue as reported by the firm in their 2014 annual report. The dollar value of total sales volume for the firm.
Number of Employees 2015	NEE '15	A measure of firm size. The total number of full-time employees the firm has during the 2015 fiscal year as reported in their annual report.
Total Words	TWD	The total number of words in the firm's 2015 annual report. Used as the denominator when calculating the frequency of use for each indicator variable.
Human Capital Index	HCI	The measure of firm emphasis on human capital in their annual reports. Calculated as the sum of frequencies of the indicator variables.
Culture	CLT	An indicator variable for the Human Capital Index. Calculated as the relative amount of times 'culture' was mentioned when compared with total words.
People	PPL	An indicator variable for the Human Capital Index. Calculated as the relative

		amount of times 'people' was mentioned when compared with total words.
Talent	TAL	An indicator variable for the Human Capital Index. Calculated as the relative amount of times 'talent was mentioned when compared with total words.
Human	HMN	An indicator variable for the Human Capital Index. Calculated as the relative amount of times 'human was mentioned when compared with total words.
Team	TEM	An indicator variable for the Human Capital Index. Calculated as the relative amount of times 'team was mentioned when compared with total words.
Market Cap	MKC	A measure of firm size. Calculated as the number of shares outstanding multiplied by the stock price as of 12/31/15.

Table 2 displays the correlations and descriptive statistics for the key variables used in the analyses. Some key takeaways are that revenues for the 2014 and 2015 fiscal years are highly correlated, and both variables are also highly correlated with the number of employees in 2015. The models for all hypotheses are presented in Table 3. Model 1 includes all control variables that may affect firm performance in addition to hypothesized variables.

Table 2: Means, standard deviations, and correlations among study variables

VARIABLES	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. REV '15	2.26e+09	8.56e+09	1.00										
2. REV '14	2.27e+09	8.92e+09	1.00	1.00									
3. NEE '15	5191.28	19464.55	0.97	0.97	1.00								
4. TWD	39820.00	16205.08	0.17	0.17	0.21	1.00							
5. HCI	0.08	0.08	0.46	0.44	0.44	-0.16	1.00						
6. CLT	0.00	0.00	0.52	0.51	0.47	-0.04	0.73	1.00					
7. PPL	0.00	0.00	0.47	0.45	0.48	-0.11	0.80	0.60	1.00				
8. TAL	0.00	0.00	0.64	0.63	0.59	0.02	0.65	0.72	0.59	1.00			
9. HMN	0.00	0.00	0.22	0.21	0.19	-0.16	0.74	0.38	0.32	0.30	1.00		
10. TEM	0.00	0.00	0.12	0.12	0.13	-0.10	0.52	0.39	0.29	0.32	0.14	1.00	
11. MKC	9.19e+09	3.44e+10	0.96	0.96	0.88	0.13	0.47	0.53	0.50	0.59	0.23	0.11	1.00

*Note: N = 205 after listwise deletion with controls included
 Critical r, $p < .05 = |r| > .14$; Critical r, $p < .01 = |r| > .18$

Table 3: Relationship between HCI and firm performance (including indicating and moderating variables)

VARIABLES	Model 1	Model 2	Model 3	Model 4
REV '14	0.936*** (0.006)	0.931*** (0.006)	0.926*** (0.006)	0.882*** (0.014)
Ln NEE	1.375e+08*** (23459839.092)	1.236e+08*** (23395402.068)	1.158e+08*** (23605006.503)	1.254e+08*** (22740849.078)
TWD	-6,204.700* (2,388.592)	-3,912.640 (2,451.608)	-3,503.661 (2,432.345)	-2,969.047 (2,370.120)
Ln HCI		2.082e+09** (6.685e+08)		6.547e+08 (8.368e+08)
CLT			5.193e+11 (5.407e+11)	
PPL			3.480e+11* (1.348e+11)	
TAL			1.014e+12 (1.220e+12)	
HMN			5.471e+10 (1.006e+11)	
TEM			-2.266e+11 (1.959e+11)	
MKC				0.011** (0.004)
Ln HCI x MKC				0.014* (0.007)
Constant	-3.061e+08* (1.310e+08)	-4.726e+08*** (1.389e+08)	-3.573e+08* (1.416e+08)	-4.297e+08** (1.355e+08)
Observations	205	205	205	205
R-squared	0.996	0.996	0.997	0.997

*Note: Variables are reported using the acronyms presented in Table 1.

Standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

The following control variables were included in the regression equation is the first step of the analyses: REV '14, Ln NEE, TWD. The 2014 gross revenue for the firms was included to partial the 2015 gross revenue of the firm, accounting for year-over-year performance. The natural log of the number of employees was also included as a control variable as an additional method of accounting for firm size. The natural log was taken to ensure a normal distribution of firm size and provide for more accurate regression analysis (Grund & Westergaard-Nielsen,

2008; Kunze, Boehm, & Bruch, 2011). Finally, the total number of words used in the financial annual reports controlled for the size of the reports, given the role it played in calculating HCI.

Hypothesis 1 stated that higher values of human capital emphasis in firm financial reports, as measured by the Human Capital Index, will be positively related to gross revenue. As shown in Model 2 of Table 2, the relationship between HCI and gross revenue is significant ($p < 0.01$); for every unit increase in HCI, there is a $2.082e+09$ increase in gross revenue. Hypothesis 1 is thus supported.

Hypothesis 2 stated that “culture” would be the indicator variable of HCI that is most strongly and positively related to gross revenue. As shown in Model 3 of Table 2, when combined with the remaining four indicator variables in the HCI, the relationship between “culture” and gross revenue was not significant. Interestingly, “people” was the most significant ($3.408e+11, p < 0.05$) term in predicting firm performance when examining each of the indicator variables as a group. For the purpose of confirming the theoretical logic supporting the selection of each indicator variable, the individual relationships between each indicator variable and gross revenue were examined separately. When examined separately each of the indicator variables were significant ($p < 0.01$), confirming their inclusion as separate indicators of HCI focus. When analyzed as a group, a one unit change in the most significant indicator variable, “people,” is associated with a $3.480e+11$ increase in revenue. As such, no direct support for Hypothesis 2 was obtained. However, the individual significance of “culture” and each of the indicator variables supported the importance of each term used in the Human Capital Index.

Hypothesis 3 stated that larger market capitalization would moderate the relationship between HCI and gross revenue, such that the relationship between HCI and gross revenue will be stronger and more positive when market capitalization is low and weaker, but still positive,

when market capitalization is high. As shown in Model 4 of Table 3, there is a significant (0.014 , $p < 0.05$) moderating relationship between market capitalization and HCI. However, the results are contradictory to the proposed hypothesis that stated when MKC is low, HCI would have more effect. As can be seen in Figure 2, when MKC is high, HCI has slightly more effect but when MKC is low, HCI has almost no effect.

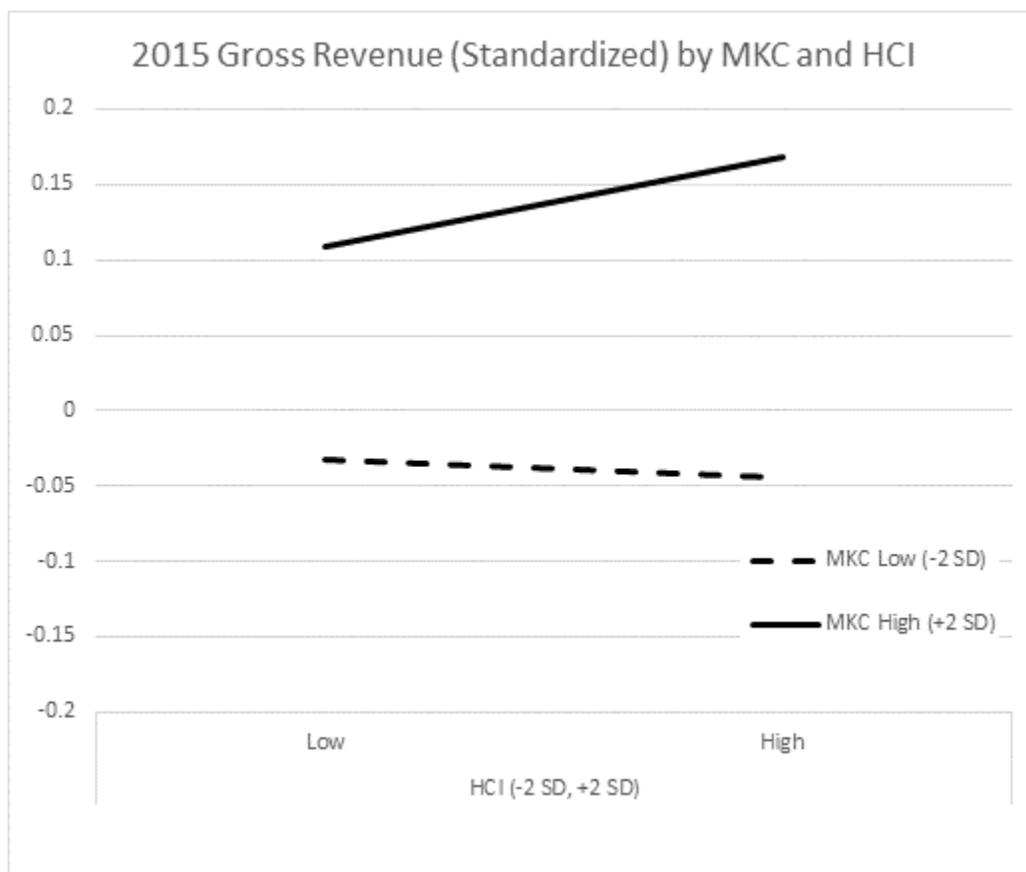


Figure 2: Moderating relationship between market capitalization and HCI

Although the moderating analysis yielded unexpected results, overall the results presented in the analyses are supportive of the hypothesized relationship between HCI and firm performance and serve as validation for the proposed model.

Chapter 5

Discussion

The findings of this study have major implications for both the theoretical and applied fields of human capital. These implications include direct contributions to the methods that are currently being used to analyze firms, specific insights into the complex and cross-functional dynamics of firm performance, and the advancement of the theoretical literature in support of human capital theory. Furthermore, the adoption of the school of thought embraced in this paper – one that values human capital and has an appreciation for the reality that it interfaces with and drives each business function – could result in even more relevant implications for firms and employees.

To this point, firms have consistently been evaluated through the use of financial metrics and models as well as by direct comparison with other companies to establish their value in the marketplace (Higgins, 2016). The validity of these valuation techniques is not disputed but results of this study suggest that incorporating a focus on other components of the firm such as human capital can be fruitful for understanding firm dynamics and performance. To evaluate and pass judgement on a company exclusively on the basis of its financial measures is comparable to judging the ability of a basketball team on the three-point shooting of each player. While a team that has a very high percentage of capable, accurate three-point shooters may seem like a viable contender to score the most points and win a championship, this analysis does not consider the physical traits, competitive spirit, or team dynamics of the players on the roster. Similarly, focusing solely on the financial measures of a firm fails to account for the culture of the company, the human capital of its employees, and the many other smaller components that combine to form the larger firm. Surely no NBA general manager would set out to develop their

team based exclusively on three-point shooting ability. So, why then are we analyzing and developing companies solely on the basis of their financial performance?

Human capital theory suggests that the skills, talents, and abilities of employees can be developed to sustain a unique competitive advantage for the firm (Barney, 1991; Barney & Wright, 1998). As individual employees invest in their human capital through personal or firm initiatives, the collective human capital of the firm grows and the extent to which firms can maintain these skills, capabilities, and knowledge within the firm creates a competitive advantage (Barney, 1986). As firms increase their competitive advantage through more productive nonphysical assets, financial theory suggests that this advantage should result in increased firm performance.

This study confirms the relationship between human capital focus and firm financial performance and offers an additional method for a more comprehensive evaluation of the firm. In doing so, the study also shows that there is a need to expand upon the narrow definitions currently offered by Wall Street analysts and financial theorists about which factors lead to success in firms. Although the argument could be made that there is simply too much information available to examine each aspect of the firm when performing these evaluations, this argument is lazy and fails to account for the significant role that human capital plays in driving each of the business processes that generate the financial results that are regularly relied on. As suggested by Eccles and Pyburn (1992), the need for a more comprehensive performance management approach is long overdue and the need for firms to adjust their ways of assessing their performance is becoming an increasingly pressing issue. To gain a true understanding of the complex nature of the firm, we must begin to look at the most abundant asset in the majority of firms, the employees, and account for their ability to drive future results. As we step away from

the balance sheet and the income statement and begin to look at firms in a more collective way – with the people supporting and running them at the center of this picture – we can gain a more in-depth appreciation for the complex role of cross-functional dynamics in determining firm performance.

The results of this study also have implications for our understanding of upper echelons theory and the ways in which executive characteristics and perceptions are manifest in the firm. The results show that upper management and their influence trickles down throughout the firm in formal and informal channels to effectively contribute to financial performance. (Seybert, 2013). Through their communications with key stakeholders, firm leaders are able to communicate their worldviews and experiences indirectly in their choice of words and offer glimpses into the various personal and strategic perceptions they utilize in their roles (Weick, 1995; Amernic et al., 2010). By better understanding the roles that these perceptions play in motivating firm culture and performance, those looking to understand the value of the firm will be able to more accurately evaluate the non-physical capital of the firm and develop a more comprehensive view of the firm.

The findings also have implications for the ways in which the resource-based view of the firm can be examined. As this study suggests, human capital, as developed and maintained through SHRM practice, can be a source of sustained competitive advantage for firms and lead to stronger firm financial performance (Wright, Dunford, & Snell, 2001). Similarly, a positive relationship has been observed between firm performance and organizational attributes such as culture, employee attitudes, and human resource management (Patterson, West, Lawthom, & Nickell, 1997). Based on the findings of this study, it is likely that there are additional non-physical resources of the firm, such as ethics and social responsibility, that can be analyzed in a

similar manner to determine their influence on firm performance. The analysis framework offered in this study can be applied to any resource of interest in future studies and could be expanded upon to allow for better understanding of the resources that drive firm performance.

Finally, this study confirms an applied existence of the human capital theory that has been proposed by a collective body of labor and management scholars over the last two decades and provides support for continued study, exploration, and development of the human capital literature. Those supporting human capital theory should make an effort to be as inclusive as possible in their research so as to incorporate as many business functions as possible, thereby developing the most comprehensive view of the firm that is possible. If this study is any indication, there is strong reason to believe that similar relationships between human capital and various business functions and metrics could be identified and analyzed to further support the value of human capital theory. For example, by examining the relationship between human capital focus and line production output on a factory floor or number of volume discount purchases made by a sourcing department, we can identify the significance of human capital in business functions like production and procurement, respectively.

The implications of this study for both the theoretical and applied fields of human capital are profound in terms of future research directions. Given that human capital is interconnected with arguably every aspect of the firm, the findings of this research could potentially impact the way in which firms are viewed and evaluated in the future. As firms begin to recognize the ways in which the value that their investment in employees can manifest itself, it is likely that this will impact nearly all of the human resource functions of the firm, including hiring and firing, training, benefits, compensation, and countless others functions. Through the use of successful

strategic human resource practices, these changes to the firm's strategy may permeate down through managers to salaried and even hourly employees, eventually altering the culture of firm and resulting in an entirely new organization (from the perspective of expectations, cultural norms, and strategic practices) with new forms of competitive advantage.

Chapter 6

Conclusion

This study sought to examine the connection between the human capital focus of firms and their subsequent financial performance in an effort to determine whether investing (with time or money) in human capital could positively impact the firm's bottom line. As stated, a statistically significant, positive relationship was found between the amount of emphasis a firm placed on human capital, as measured by the Human Capital Index, and the total revenue reported in the 2015 fiscal year for 205 firms in the Major Pharmaceuticals subsector of the Nasdaq's Health Care Industry. Additionally, the size of the firm, as measured through their market capitalization, showed a moderating effect on the relationship between the Human Capital Index and 2015 revenue. Finally, of the indicator values within the Human Capital Index – culture, people, human, talent, and team – each of these values was individually significant in predicting annual revenue. Taken together, these results support the proposed model that firms can generate a specific, measureable competitive advantage through their investment in human capital across the firm.

Although the implications of these findings have been discussed in detail earlier in this paper, there are a number of additional considerations that should be examined in future research and analysis. First, the methodology that has been offered in this study should be applied to additional sectors and industries to see if the findings hold beyond the sample examined in this study. Additionally, the model should be compared to multiple, different measures of firm financial performance to see where the relationship could potentially fall short of the expectations that have been expressed in this paper. This will allow for the continual development of a more comprehensive method for evaluating firms and could allow future

scholars to remove fruitless avenues of study from future research efforts. Second, there should be attempts to expand upon the model itself to allow for more in-depth qualitative analysis of firm annual reports. The text-mining approach that was used in this model provides a solid foundation to quantify the amount of focus that firms placed on human capital in their annual reports, but the findings of the study would be better supported through the use of a human coding system that can account for the tone, context, and various other grammatical complexities of these filings. In implementing such a system, analysis of “employee” as an indicator variable would be a valuable extension in understanding the HCI model. Finally, the composition of the Human Capital Index should be revisited to ensure that the indicator terms are the most predictive of human capital focus as the significance of each of these words may have changed as firm practices and theoretical research change over time. Similar to the way that financial metrics have evolved over time to incorporate new market trends and theoretical findings, so too should the proposed model evolve to remain as applicable as possible.

Looking forward, this study may serve as the foundation for further inquiry into the presence of an applied relationship between human capital and firm performance. As labor and management scholars continue to push for a shift in the traditional management structure of the firm – toward a balanced approach of people and profit management – they should continue to explore empirical data and theoretical models that can be shown to corporate executives as proof that human capital theory has moved beyond the realm of academic literature and has become a core component of the firms we see in the marketplace today. By drawing on the findings and implications of this study, as well as on the entire body of human capital research that has been done to this point, it is reasonable to assume that advancements in the area of applied human capital research should continue to grow in the coming years.

Appendix A

R Text Mining Syntax

```
L1: getwd()
L2: library(tm)
L3: docs <- Corpus(DirSource("~/Documents/Thesis Text"))
L4: summary(docs)
L5: getTransformations()
L6: toSpace <- content_transformer(function(x, pattern) {return (gsub(pattern, "", x))})
L7: docs <- tm_map(docs, toSpace, "-")
L8: docs <- tm_map(docs, toSpace, ":")
L9: docs <- tm_map(docs, removePunctuation)
L10: docs <- tm_map(docs, toSpace, "")
L11: docs <- tm_map(docs, toSpace, "")
L12: docs <- tm_map(docs, toSpace, "-")
L13: docs <- tm_map(docs, content_transformer(tolower))
L14: docs <- tm_map(docs, removeNumbers)
L15: docs <- tm_map(docs, removeWords, stopwords("english"))
L16: docs <- tm_map(docs, stripWhitespace)
L17: doctmatrix <- DocumentTermMatrix(docs)
L18: dim(doctmatrix)
L19: m <- as.matrix(doctmatrix)
L20: dim(doctmatrix)
L21: dtms <- removeSparseTerms(doctmatrix, 0.99)
L22: dim(dtms)
L23: write.csv(m, file="docTermMatrix.csv")
L24: inspect(DocumentTermMatrix(docs, list(dictionary=c("human", "people", "talent",
"culture"))))
```

*Note: Lx: is formatting used to note the number of the line in the file. Each individual syntax begins with the first lowercase letter following the colon.

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ACADEMIC VITA

Academic Vita of James Dlugos

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EDUCATION

The Pennsylvania State University Intended Graduation: May 2017
Schreyer Honors College *University Park, PA*

- Smeal College of Business – Bachelor of Science in Finance
- College of the Liberal Arts – Bachelor of Arts in Labor and Employment Relations

WORK EXPERIENCE

Deloitte Consulting LLP. June 2016 – August 2016
Human Capital Summer Scholar *Chicago, IL*

- Managed stakeholder assessment strategy of an \$11.3 billion merger through interviews and qualitative analysis of responses.
- Supported organization design strategy through development of a selection guide to be used by executive leadership.

University of Pittsburgh Medical Center May 2015 – August 2015
Finance Summer Associate *Pittsburgh, PA*

- Constructed an allocation model that would properly budgeted for seasonality, new hire acquisitions, and employee merit pay.
- Performed various ad hoc analysis of budgeting including reviews of spread, five-year trend reporting, and variance discovery.

INVOLVEMENT

Penn State IFC/PanHellenic Dance Marathon August 2013 – March 2017
Communications Captain – General Organization Liaison, THON Chair *University Park, PA*

- Served as the primary point of contact for 40 member organizations and managed their daily needs from the internal organization.
- Planned and led the management of communications strategies for each organization via in-person, print, and online interaction.
- Oversaw a committee of four members to execute engagement activities including family relations and THON weekend.

Chi Phi Fraternity – Alpha Delta Chapter February 2014 – May 2017
Vice President, New Member Educator *State College, PA*

- Supervised a team of 21 chairs to oversee successful execution of all internal chapter functions over a 12-month timeframe.
- Planned, scheduled, and conducted weekly meetings with the chair board to ensure continual progress of each committee.
- Designed and implemented a comprehensive new member education program emphasizing academics and skill development.

LEADERSHIP

Sapphire Leadership Program August 2013 – May 2017
Professional Development Captain *University Park, PA*

- Accepted to 50-member cohort, representing top 5% academically of Smeal College of Business incoming class.
- Directed a team of two chairs to create opportunities for fellow members to develop professional skills and networks.

VOLUNTEERISM/AWARDS

- **Volunteerism:** Penn State Dance Marathon, Relay for Life, Big Brothers Big Sisters
- **Awards:** Phi Beta Kappa Honor Society, Beta Gamma Sigma Honor Society, Phi Kappa Phi Honor Society, President's Freshman Award, President Edwin Sparks Medal, Order of Omega Greek Leadership Honor Society